Study on specific needs for information on the content of dangerous substances in construction products

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Executive Summary

The Construction Products Regulation 305/2011/EU (CPR) fully replaced the Construction Products Directive 89/106 (CPD) in July 2013. Recital 25 of the CPR calls on the Commission to further investigate whether there is a need for construction products to provide additional information on the content of hazardous substances. Similarly, Article 67 requires the Commission to assess the specific need for information on the content of hazardous substances in construction products and consider the possible extension of the information obligation in Article 6(5) to other substances.

With this in mind, the overarching objective of this report is to assist the Commission in identifying whether there is a need for manufacturers to provide additional information on the content of construction products. This is examined in the context of the protection of the health and safety of workers who install/use construction products, as well as those who consume and use these products throughout their whole life cycle. The focus of this report is therefore on presenting information on construction product certification and labelling schemes that assess the content of construction products.

To fulfil these objectives and ensure that all relevant schemes and legislation have been considered, RPA and Technalia have undertaken an extensive literature review of relevant legislation and certification/labelling schemes. In addition, over 300 key stakeholders were invited to participate in an online consultation exercise. A workshop was also held in Brussels, allowing the study team to gather additional information from key industry associations and Member State authorities, some of which administer schemes. Where necessary, telephone interviews were conducted with scheme organisers to gather further information.

This study has identified 30 schemes that appear to a) have established requirements that are specific to construction products and b) consider the content of the product. These schemes are listed in Table 1. However, due to the fact that almost no schemes have been identified that focus solely on the products' content, this study also considers dual schemes, i.e. those that rely on a mixture of content and emissions based approaches.

Table 1: Schemes considered in this study	
AENOR Medioambiente	Milieukeur
Architettura Naturale (ANAB)	Natureplus
Association of Environmentally Friendly Carpets (GUT)	NF Environment
Austrian Institute for Health and Ecological Building (IBO)	Nordic Swan
BASTA	SundaHus Miljödata
Blue Angel	BRE Environmental Assessment Method (BREEAM)
BRE Global	DGNB System
Byggvarubedömningen (BVB)	Eco Green Building
Cradle to Cradle	European Ecolabel
DGNB Navigator	Ecolabel (National) Austria
Ecocycle Council – Building Product Declaration (BPD3)	El Distintiu (the Catalonian Ecolabel)
Eco-Institut Label	Ecolabel (National) Croatia
ECOproduct	Ecolabel (National) Czech Republic
EMICODE	Ecolabel (National) Hungary
GISCODE	Ecolabel (National) Slovakia

This study shows that the 30 identified schemes are very diverse in terms of their objectives, scope, criteria and procedures. A comprehensive assessment is provided in the annexes to this report. In addition, this report explores the most salient issues in more detail for five example schemes and five example product groups. This analysis is presented in Sections 3 and 4 of the report. The main findings of both analyses are presented below.

Objectives of the Schemes

The primary objectives of the vast majority (27) of the 30 identified schemes are broader than focussing solely on the health of construction workers and users of construction products. Most schemes are motivated by a range of considerations, often combining health related objectives with those relating to environmental protection and/or sustainable development. In addition, some schemes are standalone tools while others complement schemes that certify whole buildings. Another crucial difference relates to the target audience of the 30 schemes, i.e. whether they are aimed at construction professionals, consumers or both. Differences in objectives to a certain extent explain the varying approaches adopted by the different schemes and in some cases may account for the inclusion of content-related criteria. For example, schemes concerned with lifecycle impacts may be more likely to rely on content-based approaches (e.g. DGNB Navigator).

Geographical Coverage

Typically, most schemes are mainly used in the Member State of their origin and to a lesser extent in other countries. This is the case as regards both the five selected schemes as well as more generally across the 30 schemes described in the annexes to this report. For example, DGNB Navigator, EMICODE and Natureplus are international in nature and are active in a number of European countries. ANAB and BASTA are primarily national in scope but may occasionally also be taken into account by workers and consumers outside their home countries. The most widely applied scheme is the Blue Angel scheme which is used in 21 European countries.

This geographical spread can be a result of deliberate expansion to other markets (e.g. some schemes provide information in multiple languages or have set up offices/subsidiaries in different countries) but can also occur spontaneously where schemes expand in an unmanaged manner due to the demand from buyers of construction products. For example, Natureplus is setting up new offices to branch out to new countries whilst EMICODE expects interest in their label in other countries to grow spontaneously.

Almost half (13) of the schemes originate from two countries (Germany and Sweden), possibly reflecting a high level of awareness as regards human health and environmental issues.

Product Coverage

The majority of schemes have established criteria for a wide range of products. A comparison of the scope of these schemes with CEN standardisation mandates shows that the majority of the schemes cover ten or less mandates and some cover just a single mandate. Of the five schemes selected for more detailed analysis, BASTA is the most extensive scheme, potentially covering products belonging to 21 standardisation mandates. ANAB covers nine mandates, DGNB Navigator 11, EMICODE six and Natureplus 13 mandates. The five example schemes all cover flooring, insulation, adhesives and concrete, mortar and grout and together they cover products belonging to 26 of the 32 standardisation mandates. The coverage of the five example schemes is broadly representative of all 30 European schemes, most of which cover flooring, followed by insulation, concrete, mortar and grout and adhesives. On the other hand, none of the 30 schemes have certified structural bearings and circulation fixtures.

It is also of interest that where ecolabels cover construction products, their criteria tend to be highly product specific and often relate to flooring. This may be explained by the fact that ecolabels often target the consumer segment of the market and flooring is a product that is popular with both professionals and consumers.

Substances Considered

The overwhelming majority of the schemes define the substances or substance groups that are restricted, whilst some refer to European legislation (most often to REACH and DSD/CLP) or national regulation. Whilst the diverse nature of the schemes makes generalisations difficult, some substances and substance groups appear to be a popular target for many schemes. By way of example, these include substances classified as carcinogenic, mutagenic and reprotoxic substances, persistent organic pollutants, heavy metals and phthalates.

Assessment Criteria/Procedures

The five example schemes rely on diverse approaches to assessing conformity, reflecting differences in their objectives and roles. Broadly speaking, possible approaches to assessing criteria with certification and labelling schemes can include:

- full or partial self-certification by the manufacturer;
- examination of documents provided by the manufacturer, including application forms and safety data sheets by the scheme organiser; this may involve requesting additional information from the manufacturer and may require that the manufacturer tests their products; and
- tests carried out by an independent body.

Drawing on the five example schemes, BASTA, DGNB Navigator and EMICODE mainly rely on self-certification by the manufacturer while ANAB and Natureplus require that products applying for certification undergo testing. In addition, the approval procedure for ANAB and Natureplus involves an inspection of the production site. More generally, when considering all 30 schemes in the annexes to this report it is clear that whilst some schemes use only one of the above approaches, many rely on a combination of different assessment methods and procedures. For example, the first stage in the assessment procedure may involve the examination of documentation provided by the manufacturer, followed by independent testing to determine compliance with certain criteria.

Methods of Communicating Conformity

Two main methods have been identified. The first one (used by 75% of schemes) is the use of a logo or label which is displayed on the product itself, the packaging or on accompanying documents or in marketing literature. Secondly, 64% of schemes publish a list of certified products online.

Extent of Application of the Schemes

The different schemes have been applied to varying degrees. BASTA currently has more than 82,000 products on their database, whilst other schemes have been applied to only a few construction products. This may to a large extent be a result of the different approaches to product registration, with schemes that rely on self-certification by the manufacturer and those that have been in existence for a longer period of time being more likely to have registered a larger number of products. For example, BASTA relies on self-certification by the manufacturer and has been in existence since 2007.

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1 Introduction

1.1 Background to the Study

In March 2011, the Construction Products Regulation 305/2011/EU (CPR)[1] replaced the Construction Products Directive 89/106 (CPD)[2]. The first part of the CPR took effect in 2011 and was related to the operation of Notified Bodies and technical approval bodies. The remainder of the regulation entered into force in July 2013 and introduced new requirements for manufacturers, importers and distributers when they place a construction product on the marketplace.

In the run-up to the adoption of the CPR, policy-makers also discussed the possibility of extending obligations related to the provision of information on the content of construction products. These discussions resulted in the inclusion of Recital 25 in the CPR, which states that:

> *"the specific need for information on the content of hazardous substances in construction products should be further investigated with a view to completing the range of substances covered so as to ensure a high level of protection of the health and safety of workers using construction products and of users of construction works, including with regard to recycling and/or reuse requirements of parts or materials*".

Similarly, Article 67(1) of the CPR notes:

> "*By 25 April 2014, the Commission shall assess the specific need for information on the content of hazardous substances in construction products and consider the possible extension of the information obligation provided for in Article 6(5) to other substances, and shall report thereon to the European Parliament and to the Council. In its assessment, the Commission shall take into account, inter alia, the need to ensure a high level of protection of the health and safety of workers using construction products and of users of construction works, including with regard to recycling and/or reuse requirements of parts or materials*".

Considering the above, the purpose of this study is therefore to assist the Commission in identifying whether there is a need for manufacturers to provide additional information on the content of construction products (within the framework at hand). Within this examination, such 'need' is considered in the context of the protection of the health and safety of workers who use construction products, as well as those who consume and use these products during their whole life cycle.

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[1] Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products

[2] Council Directive 89/106/EEC on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products
Council Directive 93/68/EEC and Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29 September 2003

1.2 Objectives of the Study

The purpose of this study is to clarify and to analyse the existence of specific needs for information on the content of construction products. The key tasks are to examine and analyse:

- existing voluntary schemes providing information on the content of products and distinguishing their elements specific to construction products; and
- other possible sources for establishing the existence of such specific needs for information on the content of construction products (e.g. national legislation).

The focus of the study is on information needs specific to construction products. Existing regulatory or voluntary schemes that provide information on the content of products are within the scope of this study only if they contain features specific for the treatment of construction products within them. In addition, schemes only concerned with hazards associated with emissions from products do not form the focus of this report[3].

A comprehensive assessment is provided in the annexes to this report. In addition, this report explores the most salient issues in more detail on the example of five example schemes and five example product groups. This analysis is presented in Sections 3 and 4 of the report. The study provides an overview of existing schemes and a description of their objectives, criteria for assessment, the extent of their use as well as methods of communicating compliance.

1.3 Structure of this Report

The remainder of this report has been organised as follows:

- Section 2 sets out our approach to the study; and
- Section 3 provides an in-depth analysis of selected schemes; and
- Section 4 provides an in-depth analysis of the most extensively covered product groups.

The report is complemented by annexes which provide the following information:

- Annex 1 provides an overview of the identified schemes;
- Annex 2 provides further detail on the identified schemes;
- Annex 3 provides an overview of relevant EU legislation;
- Annex 4 summarises relevant national legislation, guidelines and action plans;
- Annex 5 summarises the key findings of online consultation; and
- Annex 6 provides an overview of products covered by CEN mandate codes.

[3] These schemes are already covered by the European standardisation work and will be taken into account within the CPR system of declarations of performance.

2 Approach to the Study

2.1 Introduction

To fulfil the objectives of the study, the research team has collected information on existing schemes and legislation that provide information on the content of construction products. This included the examination of:

- public and private voluntary schemes; and
- European Union and national level legislation.

As well as a literature review, this also involved consultation with key stakeholders by means of online questionnaires hosted at http://www.rpaltd.co.uk/news-CPR.shtml

2.2 Literature Review

2.2.1 EU, National and Regional Legislation

The study team has identified and summarised European and national level legislation that set requirements concerning hazardous substances in construction products. These have been summarised in Annex 3 and 4 to this report. It should be noted that in some countries, no relevant legislation has been found.

2.2.2 Public and Private Schemes

Much of the focus of the report has been on gathering information on public and private schemes that operate within individual countries. Information for each scheme is presented in the Annex 2 in a uniform manner, allowing for easy comparison of the schemes. Schemes have been grouped by type, namely, schemes that certify buildings, Ecolabel schemes and other schemes. The key information (e.g. objective of the scheme, content requirements etc.) from each scheme has been analysed in section 3 and 4 and is also discussed in further detail in Annex 1.

2.3 Consultation

Consultation undertaken for this study sought to gather additional information from key stakeholders to supplement the literature review and address key gaps. Our approach to consultation involved:

- an online questionnaire to be distributed to stakeholders in all 27 EU Member States as well as Norway, Lichtenstein and Iceland;
- a workshop discussing interim outcomes of our analysis;
- further e-mail correspondence with scheme administrators to clarify outstanding issues; and

- telephone interviews undertaken with scheme administrators to discuss the operation of their schemes or pertinent issues in detail.

The key findings from online consultation are presented below.

2.3.1 Online Questionnaire

Number of Requests and Responses

The first part of the consultation consisted of an online questionnaire designed for:

- public authorities;
- testing bodies;
- manufacturers of construction products and their associations;
- organisations that administer schemes;
- construction companies and their associations; and
- NGOs and other stakeholders.

Over 300 key stakeholders were identified and sent an email invitation to participate in the questionnaire and if possible, disseminate the questionnaire to other interested parties. A further reminder e-mail was sent with a view to increasing the participation rate. The e-mail instructed potential participants to complete the most appropriate questionnaire, which could be found on RPA's website. A brief overview of the objectives of the study and the schemes identified by RPA was also provided alongside the questionnaire. Respondents were asked to note whether any major schemes had been omitted from this document. This should ensure that all relevant schemes have been identified and considered in this report.

The questionnaire was uploaded via Survey Monkey. This facility allowed RPA to quickly download and analyse the results. In addition to this, some associations requested that they be sent the questionnaire in PDF or Word format. This allowed them to distribute the questionnaire to their members, collect their responses and submit a collated response to RPA.

The total number of stakeholders that provided complete responses is provided in Table 2-1 below. It is noteworthy that there are a high number of blank responses. One reason for this may be that parties were interested in seeing the content of the questionnaire, but did not have the time or necessary knowledge to provide answers.

Table 2-1: Overview of respondents	
Stakeholder	**Number of Respondents**
Manufacturer of construction products	47
Member State authorities	11
Scheme administrators	9
Construction companies and their associations	4
Testing bodies	5
NGOs and others	6
Blank Responses	42
Total	**124**

2.3.2 Workshop

A roundtable discussion was held in Brussels in June 2013. Participants were invited to attend by the Commission and were made up of Member State officials and key industry association representatives. In this way, the workshop served as a cost effective means of obtaining information on activities taking place in Member States (MS), as representatives travelled to this central location, without the need for RPA to travel to each individual MS. It also helped to generate more awareness of the study, with a notable increase in the number of respondents completing the questionnaire following the workshop.

At the workshop, RPA presented the information gathered to date and opened the workshop for discussions. By adopting this flexible, semi-structured approach, participants were able to freely discuss the report and provide information on schemes that were missing. The report was also distributed to stakeholders and they were given the opportunity to submit comments on the report itself. These comments proved extremely helpful for the Final Report.

The workshop also allowed RPA to reaffirm the objectives of the study and the direction that the Final Report would take. For example, the links between potentially hazardous construction products and workers health and the future needs of the recycling industry were discussed. However, such issues were largely beyond the remit of this study.

2.3.3 Telephone Interviews

Telephone interviews provided RPA with an opportunity to supplement and verify the information gathered in online questionnaires, the workshop and desk-based research. Given that the primary focus of the report is identifying all relevant schemes and whether they focus on the content of construction products, it was important that scheme administrators were contacted with a view to arranging a telephone interview.

Contact with interviewees was initiated by e-mail with the intention of following this up with a telephone call. Due to the nature of the information required (e.g. number of product groups that are construction products, number of products certified a year), the e-mail outlined key questions that would guide the interview. To encourage participation and ensure interviewees could speak freely, the e-mail also offered to host the interviews in any

of the following languages: Bulgarian, Czech, Dutch, English, Finnish, French, German, Italian, Polish and Spanish.

In some instances, scheme administrators would provide answers to these questions via e-mail. This provided RPA with all of the necessary information and obviated the need for a teleconference.

A total of nine telephone interviews were held, in particular with scheme organisers.

Information gathered from the interviews has fed into the information gathered on schemes in the annexes to this report.

3 Case Study 1: In-Depth Assessment of Five Example Schemes

3.1 Introduction

This section of the report summarises the main issues relating to the labelling and certification of construction products using five example schemes. A more comprehensive overview of the main features of the 30 schemes identified in this report is provided in Annex 1. In addition, further details of each scheme are provided in Annex 2.

The schemes considered in this section are:

- Architettura Naturale (hereinafter referred to as ANAB[4]);
- BASTA;
- German Society for Sustainable Building Navigator (hereinafter referred to as DGNB Navigator);
- EMICODE; and
- Natureplus.

These schemes were chosen on the basis of the following criteria:

- the extent of their use across Europe: the focus is on schemes that are widely applied so that any conclusions drawn on the basis of these schemes are likely to be representative; and
- the nature of the schemes: the schemes chosen are underpinned by a variety of approaches and as such enable us to illustrate some of the wider issues applicable to certification and labelling schemes at large.

3.2 Objectives

The 30 schemes considered in this report have varying objectives. They are either primarily focused on protecting the health and safety of construction workers and/or users of construction works or encompass both health criteria and other aspirations (e.g. environmental, economic and social sustainability and ensuring that certified products are of high quality, etc.). In addition, some schemes are standalone tools while others complement schemes that certify whole buildings. Another crucial difference relates to their target audience, i.e. whether they are aimed at construction professionals, consumers or both.

The main objective of the **ANAB** scheme is to identify construction products that have a reduced environmental impact and meet requirements relevant to the certification and evaluation of buildings. In addition, ANAB aims to assure the health and safety of end-users

[4] This scheme is run by the National Association of Bio-ecological Architecture (ANAB).

and workers that manufacture construction products. The scheme is primarily targeted towards professionals but some products certified under this scheme may also be purchased by consumers.

BASTA seeks to phase out hazardous substances from construction products by providing an independent environmental assessment with the intention of protecting human health and the environment. The scheme is predominantly used by professionals but as the database is free to access, it can also be used by consumers.

DGNB Navigator is not a standalone scheme as it seeks to facilitate the planning and realisation of sustainable buildings by providing information about construction products, primarily to complement the DGNB System building certification scheme. The objectives of the scheme are based on environmental, economic and social-cultural considerations and include the consideration of workers' and consumers' health. It is of interest that when used in conjunction with DGNB System, its goals and criteria change depending on the purpose of the building in which the building materials are used. For example, different criteria apply to an industrial installation and to a kindergarten. Currently, the DGNB Navigator scheme is primarily used by construction professionals.

The aim of the **EMICODE** scheme is to ensure that construction products do not pose a hazard to the health of users and installers and also have the lowest possible impact on the environment. The main target group of this scheme are building contractors. However, some products, such as adhesives, can also be purchased by consumers and it is therefore possible that consumers also take EMICODE classification into account when purchasing construction products.

The objective of the **Natureplus** label is to promote the use of sustainable construction products, in terms of their health, environmental impacts and suitability for purpose. This scheme is mainly used by professionals.

The main characteristics of these five schemes are summarised in Table 3.1 (next page).

Table 3.1: Objectives of the five schemes			
Scheme	**Standalone scheme?**	**Considers human health only?**	**Targets professionals or consumers?**
ANAB	Yes but aims to assist with certification of buildings	No, environmental considerations are also relevant. Human health considerations focus both on workers in factories manufacturing construction products and users of construction works.	Primarily professionals but some products are also relevant to consumers
BASTA	Yes	No, also aims to protect the environment	Predominantly used by professionals but may also be accessed by consumers
DGNB Navigator	No	No, criteria relate to environmental, economic and social-cultural considerations, which include the consideration of workers' and consumers' health	Currently for professionals but might be increasingly accessed by consumers in the future
EMICODE	Yes	Primarily human health but also environmental protection	Main target group are building contractors but some products can also be purchased by consumers
Natureplus	Yes	No, environmental and quality criteria	Aimed at professionals

The above table shows that four of the five selected schemes are standalone schemes that are independent of building certification systems, although they may be used when evaluating the health and environmental performance of whole buildings (e.g. ANAB). By contrast, the primary purpose of DGNB Navigator is to complement the DGNB System building certification scheme. A similar observation can be drawn as regards the other certification and labelling schemes considered in the annexes to this report, with almost all schemes that are currently operating in the EU being independent of building certification systems. Whilst BRE Global has some linkages with the BREEAM scheme, these two schemes are not integrated to the same degree as DGNB Navigator and DGNB System.

In addition to protecting the health of construction workers and users of buildings, all five example schemes have wider-ranging aspirations encompassing environmental, economic and social-cultural objectives and criteria relating to product quality. This appears to also be the case more generally, with the primary objectives of the vast majority (27) of the 30 schemes considered in the annexes to this report also including considerations not relating to human health. Only three schemes focus exclusively on safeguarding the health of construction workers and end-users.

The five example schemes primarily target construction professionals but it is expected that consumers might also be exposed to them.

This is because some of the certified products might be intended to be sold in the professional market whilst others might be consumer products but also due to the fact that professional products are often also sold via DIY stores. Whereas some certified products will only be used by professionals in the construction sector, other products could be purchased by consumers and professionals (e.g. professional products sold via 'do – it –

yourself' stores). However, it is reasonable to expect that those schemes that provide information in databases are probably not accessed by consumers very frequently. For example, BASTA makes information available online rather than on product packaging and as the BASTA logo cannot be displayed on the product itself but only in accompanying marketing literature, it is unlikely that consumers are generally aware of the BASTA database.

3.3 Geographical Coverage

The geographical coverage of the five schemes is summarised below.

Table 3.2: Geographical coverage of the schemes

Scheme	Country of origin	Coverage	Countries also used in
ANAB	Italy	Mainly national	Some products are sold internationally.
BASTA	Sweden	Mainly national	The scheme was developed for use in the Swedish market and the database is mostly used in Sweden, however it is also used throughout Europe.
DGNB Navigator	Germany	International	The DGNB Navigator is applied across Europe but Germany is its strongest market accounting for 90% of its business. It is also active in other German speaking countries, some Nordic and Central and Eastern European countries and China, and to a lesser degree, in Southern Europe. The scheme is rarely applied in Sweden and many Western European countries.
EMICODE	Germany	Europe	For example, EMICODE has almost 100% coverage for floor installation products in Austria and Switzerland and the Netherlands whilst in Italy more than 50% of floor installation products are covered.
Natureplus	Germany	International	The Natureplus association has offices or contact points in Austria, Belgium, France, Germany, Hungary, Italy, Lithuania, the Netherlands, Switzerland and in the UK

Typically, most schemes are primarily used in the Member State of their origin and to a lesser extent in other countries. This is the case as regards both the five selected schemes as well as more generally across the 30 schemes described in the annexes to this report. DGNB Navigator, EMICODE and Natureplus are international in nature and are active in a number of European countries. ANAB and BASTA are primarily national in scope but may occasionally also be taken into account by workers and consumers outside their home countries.

This geographical spread can be a result of deliberate expansion to other markets (e.g. some schemes provide information in multiple languages or have set up offices/subsidiaries in different countries) but can also occur spontaneously where schemes expand in an unmanaged manner due to the demand from buyers of construction products. For example, Natureplus is setting up new offices to branch out to new countries whilst EMICODE expects interest in their label in other countries to naturally expand.

Both within the sample of the five example schemes considered as well as more generally, a large proportion of schemes originate from Germany and Sweden. Overall, some 43% of the 30 schemes originate from Germany (GUT, Blue Angel, DGNB System, DGNB Navigator, Eco-Institut Label, EMICODE, GISCODE and Natureplus) and Sweden (BASTA, BVB, Ecocycle Council, SundaHus and Eco Green Building). Considering the high number of certified products, the number of German and Swedish schemes may be indicative of the high level of awareness concerning human health and environmental issues rather than a reflection of a high degree of fragmentation of the certification landscape in these two countries.

3.4 Content vs. Emissions

The vast majority of schemes considered in this report rely on a mixture of content and emission based approaches which is often dependent on product specific criteria. Of the five schemes considered in this section, only BASTA employs a purely content based approach with the other four schemes also considering product emissions. More generally, only two of the 30 schemes in Europe appear to focus solely on content-related requirements (these being BASTA and BRE Global). However, it should be noted that the assessment criteria for BRE Global are predominantly focused on environmental impacts and sustainability, with only a single category looking at human toxicity.

In considering the manufacturing process of the product and its use phase, the approval procedure for the **ANAB** label relies both on substance content (prohibited substances and content thresholds) and emissions.

Under the **BASTA** scheme, products are required to meet criteria that relate only to their chemical content. Emissions from products are not assessed at all. The reason for this is that emissions testing can be complicated and often requires external expertise. Therefore the exclusion of emission criteria is seen by BASTA as a more pragmatic approach aimed at easing the burden on product suppliers. In addition, BASTA believes that there is insufficient evidence of the relationship between emissions in indoor environments and impacts on human health. In line with the precautionary principle, the approach taken by BASTA is based on the assumption that where a substance is not present in a product, there will be virtually no emissions. However in appreciation of the importance of assessing emissions, BASTA hopes to add emissions related criteria in the future.

Manufacturers registering with **DGNB Navigator** are required to declare the content of products as well as the emissions of certain substances. Reasons for considering product content (and not just emissions) include the relevance of this criterion from the life-cycle perspective.

Requirements of the **EMICODE** scheme also relate to both the emissions and the content of the product. The reasons for adopting a mixed approach include both technical and market acceptance considerations. It is believed that for some substances it is easier to have a ban rather than an emissions test and it would not be practicable to test for emissions of all substances regulated by EMICODE. In addition, some substances (such as oximes in sealants) are undesirable for reasons of preventing bad odour and should therefore not be used at all.

Natureplus considers both the content as well as emissions from the product in question. There is a list of substances that are not allowed to be used in certified products and stipulations regarding emissions of certain substances. Another reason for using content related criteria is the historical evolution of the Natureplus scheme. The first assessment criteria were based on content (with emissions criteria being added as standards have developed) and remain within the overall assessment framework to this day.

By way of a summary, the reasons for using content related criteria include:

- the complicated nature of emissions testing which is said to require external expertise and be more burdensome for the applicant than providing information on product content, in particular where the scheme is concerned with multiple substances;
- perception of that link between indoor emissions and health outcomes is not based on sufficient evidence (BASTA);
- a high degree of correlation between content and emissions; and
- the suitability of information on product content for lifecycle assessments.

3.5 Product Groups Covered

Table 3.3 provides detailed information on the potential scope of the five schemes, i.e. product groups for which these schemes have established criteria (general or specific).

Table 3.3: Products covered by the five schemes

Scheme	Products covered
ANAB	• clay tiles, bricks, and thermo-insulating blocks; • natural stone products; • wood-cement, jacket-blocks and flooring products; • insulating products; • cast stone products; • plastering and masonry mortars; • ceramic tiles; • wood treatment products; • construction systems; and • waterproofing roofing membranes.
BASTA	• building materials; • wood products; • decoration materials and paint; • interior and joinery products; • fixing devices; • door furniture; • home security; • garden; • building components; • household items; • gas goods, fuel and explosives; • heating, ventilation and sanitation items, water supply and drainage items; • ventilation; and • supplies.

Table 3.3: Products covered by the five schemes	
Scheme	**Products covered**
DGNB Navigator	• doors, windows and window systems; • surface treatments and coatings; • ventilation systems; • external wall cladding and façade systems; • interior walls, inner wall cladding and building boards; • mortars and screeds; • ceiling coverings and ceiling systems; • flooring and floor systems; • roofing materials and waterproofing systems; • water and wastewater systems; • lighting; • insulation; • metal building materials; • adhesives; and • services, e.g. engineering services, project management, facility services.
EMICODE	• liquid products; • mineral products e.g. cement and screeds; • pasty products e.g. adhesives; • ready for use products e.g. underlays, insulation boards; • joint sealants, joint insulations, joint sealing tapes; and • surface coatings for wood flooring.
Natureplus	• components; • floor coverings; • roof slates and tiles; • insulation (from renewable materials, mineral-based and composite insulation systems); • timber and wood materials; • adhesives and sealants; • masonry elements; • mortar and plaster renders and adhesives; and • dry-wall construction boards.

The coverage of the five schemes is also considered in Table 3.4, with the product considered within the scope of the schemes determined by CEN mandate codes (a similar overview for all 30 European schemes is presented in Table A1.6 in Annex 1), showing that BASTA is the most extensive scheme, potentially covering products belonging to 21 standardisation mandates. ANAB covers 9 mandates, DGNB Navigator 11, EMICODE 6 and Natureplus 13 mandates. The five example schemes all cover flooring, insulation, adhesives and concrete, mortar and grout and together they cover products belonging to 26 of the 32 standardisation mandates. The coverage of the five example schemes is broadly representative of all 30 European schemes, most of which cover flooring, followed by insulation, concrete, mortar and grout and adhesives. On the other hand, none of the 30 schemes have certified structural bearings and circulation fixtures. It is also of interest that the vast majority of the 30 schemes cover 10 or less mandates and some cover just a single mandate (for more information please refer to Table A1.6 in Annex 1).

Table 3.4: Construction products eligible for certification by CEN mandate codes							
	Mandate	**ANAB**	**BASTA**	**DGNB Navigator**	**EMICODE**	**Natureplus**	**Total**
M100	Precast concrete products		X				1
M101	Doors, windows		X	X		X	3
M102	Membranes	X				X	2
M103	Thermal insulating products	X	X	X	X	X	5
M104	Structural bearings						0
M105	Chimneys						0
M106	Gypsum products		X			X	2
M107	Geotextiles		X				1
M108	Curtain walling			X			1
M109	Fixed fire-fighting equipment		X	X			2
M110	Sanitary appliances		X				1
M111	Circulation fixtures						0
M112	Structural timber products and ancillaries		X			X	2
M113	Wood based panels		X			X	2
M114	Cement		X		X		2
M115	Reinforcing steel		X				1
M116	Masonry					X	1
M118	Waste water disposal		X	X			2
M119	Floorings	X	X	X	X	X	5
M120	Structural metallic products		X	X			2
M121	Wall and ceiling finishes	X	X	X			3
M122	Roof coverings	X	X	X		X	4
M124	Road construction products						0
M125	Aggregates		X				1
M127	Adhesives	X	X	X	X	X	5
M128	Concrete, mortar and grout	X	X	X	X	X	5
M129	Space heating appliances						1
M131	Pipes, tanks NOT in contact with drinking water		X				1
M135	Glass						0
M/443	Power, control and communication cables						0
M/474	Sealants for non-structural use in joints in buildings and pedestrian walkways	X	X		X	X	4
M/489	External thermal insulation composite systems	X				X	2
	Number of Mandates Covered	9	21	11	6	13	26

3.6 Substances Covered

A full analysis of the substances or substance groups covered by the 30 schemes is provided in Tables A1.7 and A1.8 in Annex 1. This section of the report provides a brief summary of the most salient features of the five example schemes.

As can be seen from Table 3.5, four of the five example schemes refer to EU or national legislation when defining regulated substances. These references are typically used in conjunction with additional scheme-specific lists of restricted/regulated substances.

Table 3.5: References to EU and national legislation by the five schemes

Scheme	Content requirements				
	Thresholds / Banned Substances Listed under REACH	Thresholds / Banned Substances Listed under DSD/DPD/CLP	Thresholds / Banned Substances listed under EPD	Thresholds / Banned Substance Listed under National Legislation	Other Banned Substances / Content Requirements
ANAB	Yes	Yes			Yes
BASTA	Yes	Yes		Yes	
DGNB Navigator			Yes		Yes
EMICODE	Yes	Yes		Yes	Yes
Natureplus	Yes	Yes		Yes	Yes

Whilst the diverse nature of the schemes makes generalisations difficult, some substances and substance groups appear to be a popular target of the five schemes. By way of example, these include:

- carcinogenic, mutagenic and reprotoxic (CMR) substances;
- persistent, bio accumulative and toxic (PBT) substances;
- volatile organic compounds (VOCs); and
- lead.

3.7 Assessment Criteria/Procedures

The five example schemes rely on diverse approaches to assessing conformity, reflecting differences in their objectives and roles. Broadly speaking, possible approaches to assessing criteria with certification and labelling schemes can include:

- full or partial self-certification by the manufacturer;
- examination of documents provided by the manufacturer, including application forms and safety data sheets by the scheme organiser; this may involve requesting

additional information from the manufacturer and may require that the manufacturer tests their products; and
- testing carried out by an independent body.

BASTA, DGNB Navigator and EMICODE mainly rely on self-certification by the manufacturer while ANAB and Natureplus require that products applying for certification undergo testing, which, in some cases must be carried out by an independent body. In addition, the approval procedure for ANAB and Natureplus involves an inspection of the production site.

More broadly, when considering all 30 schemes in the annexes to this report it is clear that whilst some schemes use only one of the above approaches, many rely on a combination of different assessment methods and procedures. For example, the first stage in the assessment procedure may involve the examination of documentation provided by the manufacturer, followed by independent testing to determine compliance with certain criteria.

ANAB's approval procedure involves a preliminary assessment of products and testing, a lifecycle assessment (LCA) and an in situ audit of the manufacturing processes, which includes an audit of the manufacturer's health and safety and environmental management systems. Certificates awarded to products are valid for three years. The testing of a product will be repeated if a manufacturer changes the composition of the product or the process by which it is manufactured. Whilst this scheme contains requirements for products during manufacture and end use, it does not contain requirements for protecting contractors that install these products. The reasoning behind this is that it is difficult to control the conditions under which a contractor will install the product (e.g. whether they will wear personal protective equipment).

A **BASTA** registration is a self-declaration and as such suppliers are responsible for ensuring the information provided by them is correct. The manufacturer is responsible for providing a declaration of composition, accompanied by supporting documentation which shows that all components meet the criteria and the methods used to determine the absence of specified properties. This can include Safety Data Sheets or test results. In addition, suppliers must also prove that the assessment has been conducted by a person that is competent to assess the relevant health and environmental requirements. If the producer does not have information on the constituent substances of the product or lacks data to determine whether a substance meets the relevant criteria, the product is denied a BASTA registration. A self-declaration approach is favoured by BASTA because it is less time consuming and less costly for suppliers. Suppliers pay an annual subscription fee of around €1,700 which allows them to register an unlimited number of products. Smaller businesses can pay a reduced fee of around €1,400.

BASTA undertake regular audits by means of spot checks with the assistance of external auditors. Each year, BASTA estimates that around 25-30% of suppliers receive an unannounced audit. Within each audit, the supplier must demonstrate that the relevant criteria have been satisfied and submit the documentation showing how the product was

assessed for checking (no tests are carried out by auditors). BASTA estimates that non-compliance is around one in 1,000 products.

EMICODE also operates a self-certification system and ensures compliance by means of spot-checks. Companies carry out or commission the relevant tests, self-classify and self-register the products in a licencing procedure which is free of charge. The advantage of this approach is that it minimises the costs for manufacturers, which are afforded the flexibility to introduce slight changes to their formulations (e.g. adding water) or change brand names without having to resubmit the product to be re-evaluated and retested by a third party.

Compliance with EMICODE is ensured by the Association for the Control of Emissions in Products for Flooring Installation, Adhesives and Building Materials (GEV) which undertakes spot checks of products available on the market. Products that undergo spot checks are usually randomly selected by GEV and tests are carried out by independent test bodies. The number of products tested differs from year to year, primarily depending on the budget available. In the current year, around 30-50 products may be tested this year. As regards non-compliance, the detection rate is usually quite low with only a few of the 30-50 EMICODE-labelled products tested annually not being compliant with the criteria. However, last year, of the 12 products tested, three products were not compliant with GEV criteria. It was noted by GEV that this was the highest non-compliance rate identified to date. In addition, manufacturers often test their competitor's products and inform GEV about products that do not meet the necessary requirements.

Information on the product is entered directly into the **DGNB Navigator** online database by the manufacturer. Data have to be referenced and data sources often include Safety Data Sheets, EPDs or VOC data from the AgBB. Information provided is quality assured by DGNB. In addition, products that do not conform to the philosophy of the DGNB can be refused registration but the DGNB is yet to make use of this option.

The assessment process used by **Natureplus** usually involves visiting production sites to take samples and subsequently completing laboratory tests. Products awarded the Natureplus quality seal are certified for three years, with tests to ensure continued compliance after year one and two. In year three the compliance test is more detailed and similar to the initial testing procedure.

3.8 Communicating Conformity

The five selected schemes communicate conformity by displaying a logo or label; however, BASTA does not allow suppliers to display the logo directly on the product, although it can be used in marketing literature and information sheets accompanying the product. BASTA, DGNB Navigator and Natureplus have published the list of registered products online, with BASTA and DGNB also providing information on the content of the products.

Table 3.6: Methods of communicating conformity to users			
Scheme	**Details**	**Label/ certificate**	**Online database**
Architettura Naturale (ANAB)	Certified products, services and firms are awarded the ANAB-ICEA mark.	X	
BASTA	Products meeting the BASTA or BETA requirements are listed on the BASTA database, which is free to access online. The BASTA logo can be displayed in marketing literature and in the accompanying information sheets. The scheme is not officially an Ecolabel and suppliers are not permitted to display the logo directly on products.	X	X
DGNB Navigator	Products are listed in the online database which complements the DGNB System criteria. Manufacturers are also permitted to use DGNB Navigator logo which includes a unique registration number which relates to their product.	X	X
EMICODE	An EMICODE classification label is affixed to products that comply to set criteria. These labels categorise indoor installation products, adhesives and construction materials in the following categories: • EMICODE EC1 Plus - indicating "very low emission"; • EMICODE EC1 - indicating "very low emission"; and • EMICODE EC2 - indicating "low emission"; In addition, the letter "R" (which stands for "regulated") can be added to the classification, meaning that while these products have low emissions, protective equipment may need to be used when applying them (e.g. protective gloves and/or goggles).	X	
Natureplus	Conformity is communicated by means of a label and publication on the Natureplus website.	X	X

Table A1.10 in Annex 1 provides an overview of the methods of communicating conformity to users for all 30 schemes identified in this report. Around 72% of schemes permit the use of a logo on the product, packaging or marketing material; in addition, certificates may also be awarded that provide further details. Research indicates that 61% of schemes publish information on certified products on their websites in some format. The degree of sophistication varies considerably, from a simple list to a database which allows the user to search according to criteria.

3.9 Objectivity/Impartiality

The five schemes considered in this section all strive to provide independent and objective assessment of products.

ANAB is managed by an independent testing body (Environmental and Ethical Certification Institute, hereinafter ICEA) and the samples supplied by the applicant or obtained during production site inspections are analysed through external laboratories.

BASTA is a non-profit company managed by IVL (Swedish Environmental Research Institute), an organisation that is jointly owned by the Swedish Government and the Swedish industry.

DGNB Navigator is run by the German Society for Sustainable Building (DGNB), which is a non-profit and non-governmental organisation.

EMICODE is run by GEV, which is an industry association of adhesives manufacturers. Independence is ensured for example by GEV refusing to take on new product categories just for the sake of a single company or a single product. Therefore, a new product category is only included if there is widespread interest from an industry branch or at least several companies. Testing laboratories must have a GEV test method chamber and be accredited according to ISO 17025. Although certain testing laboratories are recommended based on the results of previous tests, no testing laboratory is excluded from being assigned in order to keep competitive prices for tests.

The assessment carried out by **Natureplus** is based on a manufacturer declaration, with all inspections and tests being performed by independent, accredited laboratories, certified in accordance with e.g. ISO EN 16000 for emission chamber tests and other EN norms for laboratory testing.

Broadly speaking, the 30 schemes considered in the annexes to this report rely on a range of methods for ensuring that their assessment remains objective and impartial, including:

- compliance with standards, such as ISO/IEC 17025, ISO14040 and ISO 14024;
- reliance on independent bodies for application assessment;
- the use of accredited laboratories for testing; and
- use of the precautionary principle, whereby in instances where there is a lack of information, the relevant label may not be awarded.

3.10 Extent of Use of the Five Schemes

The extent to which the five schemes are being used can be measured in different ways, such as by focussing on the number of certified products or companies, their market shares, the number of units sold, the turnover generated by the sale of these products or the share of the total number of products certified in the relevant Member State(s). Diversity of information provided by the schemes makes it difficult to provide a direct comparison of the extent to which the different schemes are being applied. In addition, even where several schemes provide information on the number of products certified, it is possible that they use different definitions of what constitutes a product. For example, the availability of the product in different colours, may result in that product being counted as several products by organisers of some schemes. Available information on the extent to which the five schemes have been applied is summarised below.

There are 35 companies which offer products that carry the **ANAB** label but it is not clear how many products have actually been certified. Overall, only a small fraction of the overall market for construction products, perhaps as little as one or two per cent, is ANAB-certified. However, within certain product categories, the market share of ANAB certified products may be significant. For example, one of the major Italian clay tile manufacturers produces products that meet the ANAB criteria, which has resulted in about 60% of clay tiles in Italy bearing the ANAB label.

BASTA estimates that all-in-all they cover around 20% of the market in Sweden, with around 80-90% of the chemicals market (paints, glues and adhesives). There has been a steady rise in subscribed suppliers, with roughly 40-50 new suppliers joining the scheme each year, with the total number of suppliers in the BASTA scheme currently being around 320. In total, the BASTA database contains around 82,000 products of which around 77,000 can be classified as construction products in accordance with the definition used for the purposes of this study. It is difficult to quantify the number of products added annually, as products can be removed and can fluctuate depending on the number of products each supplier registers, which can range from 100 – 1000+ products. The **DGNB Navigator** database provides information on 229 products, of which around 190 can be classified as construction products for the purposes of this study.

Around 3,200 products are currently certified with the **EMICODE** scheme (with approximately one-third of them being adhesives), with almost 100% coverage of the market for floor installation products in some countries. It was noted that the number of products certified has been steadily growing both due to the increasing number of GEV members as well as existing members certifying an increasing number of products.

There are currently around 60 manufacturers with products certified by **Natureplus** with a total of 200 products certified under this scheme, with around 92% defined as construction products for the purposes of this study. The associated turnover is around €500 million across Europe.

4 Case Study 2: In-depth Assessment of Five Example Product Groups

4.1 Introduction

This section of the report has identified which products are most likely to be certified under a construction product or Ecolabel scheme in Europe. Desk based research helped to ascertain which products or product groups were covered by each of the schemes. For some schemes, this involved an analysis of the schemes product database whilst for others, an examination of the product group criteria was more appropriate. The teleconferences that formed part of the consultation also helped to clarify any outstanding issues with regard to the products that a scheme covered.

After the list of products or product groups covered by each scheme had been collected, they were allocated to broader categories in the form of CEN mandate groups (see Annex 6 for more details). This allowed us to identify the top five product groups (as defined by CEN mandates) that could potentially be certified by a scheme (Table 4.1).

Table 4-1: Product groups considered for further analysis

Mandate	Title	Number of schemes covering mandate
M119	Flooring	19
M103	Insulation	14
M128	Concrete, mortar and grout	12
M122	Roofing	10
M127	Adhesives	10

4.2 Analysis

The analysis of the product specific and product group criteria for schemes has focused on those criteria pertinent to the potentially hazardous content of construction products. For each scheme a table outlines whether the scheme makes reference to legislation such as REACH, DSD or CLP. In this way, it is possible to see the types of requirements that each scheme requires for groups of products to be certified (as defined by CEN mandate). In addition to this, the extent to which the scheme contains product specific criteria as opposed to general criteria applicable to a range of construction products is discussed.

The overall importance of the CEN mandate group for each scheme has also been explored. By comparing the percentage of construction products that have been certified by the individual CEN mandate against all products that have been certified, broad conclusions will be drawn.

4.3 Flooring

Nineteen schemes have product specific or product group criteria that fall within the scope of the CEN Mandate flooring (Table 4-2). Examples of products certified by schemes include:

- parquet flooring;
- laminate flooring;
- plastic flooring;
- linoleum flooring;
- textile flooring;
- safety tiles;
- subfloor systems;
- clay tiles and bricks;
- wood and cement jacket-blocks and flooring products; and
- skirting strip.

Product specific content criteria

Of the 19 schemes, 10 have specific criteria that relate to flooring. Interestingly, 7 are schemes targeted towards consumers, 5 of which are Ecolabels[5]. Given that flooring is one of the construction products that a consumer may purchase independent of a professional contractor, as opposed to gypsum or structural bearings, this is not surprising. It may also be indicative of consumer demand for flooring products that have been certified with an Ecolabel.

The content requirements go beyond REACH, DSD and CLP, including criteria for heavy metals and phthalates. It is also common for schemes to specify limit values or ban specific chemicals. This range of criteria would indicate that criteria for flooring under the Ecolabel schemes are relevant and contribute to protecting the health of end users.

[5] Milieukeur, European Ecolabel, Ecolabel (National) – Austria, Ecolabel (National) - Croatia and Ecolabel (National) - Czech Republic

Table 4-2: Specific content criteria for flooring (M119)													
Scheme	Specific criteria	REACH / DSD/CLP	Substances of very high concern	Environment – (ecotoxicity, biodegradability and potential for bioaccumulation, biocidal, HFC)	Heavy metals	POPS	Phthalates	Flame retardant	Nano-materials	TRGS	MAK Value	IARC Group	Other content criteria
Architettura Naturale (ANAB)	No	Yes		Yes									Harmfulness to human health – no further details identified Radioactivity Index I
Association of Environmentally Friendly Carpets (GUT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					Banned or limited: • chlorophenols; • formaldehyde; • polycyclic aromatic hydrocarbons; • inorganic fibres; • anti-soil and anti-stain finishes; • vulcanisation accelerators; and • dyes, pigments and dyeing mill adjuvants.
BASTA	No	Yes		Yes	Yes								Assessing criteria are also based on PRIO-guide
Blue Angel	Yes	Yes			Yes		Yes	Yes		Yes	Yes		
BRE Global	No	No		Yes									Human toxicity is measured in kg dichlorobenzene
Cradle to Cradle	No				Yes		Yes	Yes					Banned chemical substances: • halogenated polymers; • chlorinated hydrocarbons; and • polycyclic aromatic hydrocarbons.

Table 4-2: Specific content criteria for flooring (M119)													
Scheme	Specific criteria	REACH / DSD/CLP	Substances of very high concern	Environment – (ecotoxicity, biodegradability and potential for bioaccumulation, biocidal, HFC)	Heavy metals	POPS	Phthalates	Flame retardant	Nano-materials	TRGS	MAK Value	IARC Group	Other content criteria
DGNB Navigator	No				Yes								VOCs
Eco-Institut Label	Yes	Yes		Yes (HFC)	Yes	Yes	Yes			Yes	Yes	Yes	Prohibited substances: • organotin compounds; • antimony trioxide; • barium compounds (except barium sulphate); • pyrethroids; • organophosphates; and • organic halogen compounds.
ECOproduct	No	Yes		Yes									
EMICODE	No	Yes	Yes										Not permitted: • methylethylketoxim; and • methylisobutylketoxim.
GISCODE	Unknown	Yes											
Milieukeur	Yes	Yes		Yes	Yes			Yes					VOCs must be <0.1% in adhesives. **Secondary rubber granulate** Carcinogenic substances are not permitted during the production process in pigments, anti-degrading substances, blowing agents, retarding agents and accelerators. Must conform to the threshold-limit value of the European Toy Standard EN 71.

Table 4-2: Specific content criteria for flooring (M119)													
Scheme	Specific criteria	REACH / DSD/CLP	Substances of very high concern	Environment – (ecotoxicity, biodegradability and potential for bioaccumulation, biocidal, HFC)	Heavy metals	POPS	Phthalates	Flame retardant	Nano-materials	TRGS	MAK Value	IARC Group	Other content criteria
Natureplus	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	**Flexible floor covering** Content limits for: • EOX; • colourants; • metals and metalloids; and • pesticides. **Textile floor coverings** Content limits for: • AOX; • metals and metalloids; • formaldehyde; • pH • amines (azo pigments); • dispersion colourants; • flame retardant and proofing agents; • pesticides; • pentachlorophenol; • natural rubber latex; • filler materials; and • foreign fibres.
Nordic Swan	Yes	Yes		Yes	Yes		Yes	Yes	Yes				

Table 4-2: Specific content criteria for flooring (M119)													
Scheme	Specific criteria	REACH / DSD/CLP	Substances of very high concern	Environment – (ecotoxicity, biodegradability and potential for bioaccumulation, biocidal, HFC)	Heavy metals	POPS	Phthalates	Flame retardant	Nano-materials	TRGS	MAK Value	IARC Group	Other content criteria
SundaHus Miljödata	No	Yes		Yes	Yes								KIFS 2005:7
European Ecolabel	Yes	Yes		Yes	Yes		Yes						Not permitted in wood flooring: • halogenated organic compounds; • ziridine; • polyaziridines; and • organic tin compounds.
Ecolabel (National) - Austria	Yes	Yes		Yes	Yes		Yes	Yes					Prohibited: • fungicides; • bactericidal; • azo dyes; • pentachlorophenol; • hazardous pesticides; • aromatic hydrocarbons; and • cobalt compounds.
Ecolabel (National) - Croatia	Yes	Yes			Yes								Wood intended for indoor use must not be impregnated with preservatives. Prohibited: • halogenated organic compounds; • aziridine;

Table 4-2: Specific content criteria for flooring (M119)													
Scheme	Specific criteria	REACH / DSD/CLP	Substances of very high concern	Environment – (ecotoxicity, biodegradability and potential for bioaccumulation, biocidal, HFC)	Heavy metals	POPS	Phthalates	Flame retardant	Nano-materials	TRGS	MAK Value	IARC Group	Other content criteria
													• poliaziridon nor dyes; • boron; and • organic tin. Limits for VOCs and formaldehyde
Ecolabel (National) - Czech Republic	Yes	Yes		Yes	Yes		Yes	Yes					Content limits for: • wool processing; • polyester; • polypropylene; • foam rubber (natural and synthetic latex and polyurethane); • dyes; and • formaldehyde. Vulcanised foam is not permitted for coatings

Importance of flooring to schemes

In order to determine the importance of flooring products to each of the schemes, the proportion of certified products which are flooring has been calculated. It is interesting that of those schemes for which this information is available (Table 4-3), the percentage of flooring products as a total of all certified products ranges from no flooring products having been certified (Ecolabel Croatia) and all products certified under the scheme being flooring products (Association of Environmentally Friendly Carpets (GUT)). It should be noted that the actual number of certified products for GUT has not been identified and that it has been assumed that 100 per cent of their products are flooring, as this is the only product group covered.

Looking at other schemes, it is notable that of the 17,754 products certified under the European Ecolabel, 35 per cent of them are flooring products. The high percentage of flooring products certified coupled with the fact that flooring products are the only construction product certified under the European Ecolabel may again be indicative of consumer demand for flooring to be certified with an Ecolabel. The high number of flooring products and percentage may also be accounted for by the wide range of flooring products available to consumers that may be certified.

To some extent, this consumer demand may be more generally reflected in the other schemes such as BASTA, Blue Angel, BRE Global, DGNB Navigator and Eco-Institut. Although the percentages for these schemes are relatively low and range from 7 – 17 per cent, the breadth of products that may be covered must also be taken into account.

Table 4-3: Proportion of products under mandate M119 (flooring)			
Scheme	**Number of products certified under M119**	**Total certified products (all mandates and non-construction products)**	**% products under M119**
Architettura Naturale (ANAB)	9	399	2%
Association of Environmentally Friendly Carpets (GUT)	Unknown but only cover flooring	Unknown but only cover flooring	100%
BASTA	6,620	82,197	8%
Blue Angel	383	5,845	7%
BRE Global	538	3,188	17%
Cradle to Cradle	Unknown		
DGNB Navigator	28	217	13%
Eco-Institut Label	41	275	15%
ECOproduct	Unknown		
EMICODE	Unknown		
GISCODE	Unknown		
Milieukeur	19	Unknown	
Natureplus	10	222	5%
Nordic Swan	Unknown		
SundaHus Miljödata	Unable to classify		
European Ecolabel	6,250	17,754	35%
Ecolabel (National) - Austria	6	301	2%
Ecolabel (National) - Croatia	0	12	0%
Ecolabel (National) - Czech Republic	1	119	1%

4.4 Insulation

The range of products that fall within the CEN mandate insulation is comparatively smaller than some of the other CEN mandates. Individual products covered include:

- thermal insulation;
- rigid foam insulation boards from fossil fuels;
- mineral thermal insulation;
- thermal insulation made from renewable resources;
- thermo insulating clay blocks;
- thermo-acoustic insulating products;
- expanded insulating mineral products;
- mineral wool insulation;
- cellular plastic insulation;
- extruded cellular plastic insulation;
- wood wool insulation; and
- foamed plastic insulation.

Product specific content criteria

Table 4-4 shows the content criteria used by the schemes which can potentially certify insulation. As with flooring, it would seem that most schemes that are targeted towards the consumer market have product specific criteria for insulation. These being Blue Angel, Ecolabel (National) Austria, Ecolabel (National) Croatia, Ecolabel (National) Czech Republic and Ecolabel (National) Hungary. The one exception to this rule is Natureplus, which has product specific criteria but is targeted towards professional contractors.

REACH, DSD or CLP legislation forms the basis for the content criteria for 10 out of the 14 schemes, with environment and heavy metal criteria also being important for most of the schemes.

Table 4-4: Specific content criteria for insulation (M103)													
Scheme	**Specific criteria**	**REACH / DSD / CLP**	**Substances of very high concern**	**Environment – (ecotoxicity, biodegradability, potential for bioaccumulation, biocidal, HFC)**	**Heavy metals**	**POPS**	**Phthalates**	**Flame retardant**	**Nano-materials**	**TRGS**	**MAK Value**	**IARC Group**	**Other content criteria**
Architettura Naturale (ANAB)	No	Yes		Yes									Harmfulness to human health – no further details identified Radioactivity Index I
BASTA	No	Yes		Yes	Yes								Assessing criteria are also based on PRIO-guide
Blue Angel	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Aklylphenol ethoxylates are not permitted.
BRE Global	No			Yes									Human toxicity measured as kg 1,4-dichlorobenzene eq.
Cradle to Cradle	No				Yes		Yes	Yes					Banned chemical substances: • halogenated polymers; • chlorinated hydrocarbons; and • polycyclic aromatic hydrocarbons.
DGNB Navigator	No				Yes								VOCs
ECOproduct	No	Yes		Yes									
EMICODE	No	Yes	Yes										Not permitted: • methylethylketoxim; and • methylisobutylketoxim.
Natureplus	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Content limits for: • halogen-organic; compounds • polyester fibres;

Table 4-4: Specific content criteria for insulation (M103)													
Scheme	**Specific criteria**	**REACH / DSD / CLP**	**Substances of very high concern**	**Environment – (ecotoxicity, biodegradability, potential for bioaccumulation, biocidal, HFC)**	**Heavy metals**	**POPS**	**Phthalates**	**Flame retardant**	**Nano-materials**	**TRGS**	**MAK Value**	**IARC Group**	**Other content criteria**
													• PAH; • metals and metalloids; and • pesticides.
SundaHus Miljobyygard	No	Yes		Yes	Yes								KIFS 2005:7
Ecolabel (National) Austria	Yes	Yes						Yes					Lead glass is not permitted in mineral thermal insulation. Limits for boron compounds in thermal insulation made from renewable resources
Ecolabel (National) Croatia	Yes	Yes		Yes									
Ecolabel (National) Czech Republic	Yes	Yes		Yes									Basic requirements relating to national legislation.
Ecolabel (National) Hungary	Yes												Criteria are harmonised with the European Ecolabel where they exist. It has not been possible to identify specific criteria.

Importance of insulation to schemes

Although insulation can be certified by many schemes across Europe, the percentage of insulation products certified as a total of all products is relatively low (Table 4-5). Indeed, there are two schemes which have criteria for insulation but have yet to certify any insulation products (Natureplus and Ecolabel (National) Hungary). Whilst the scheme with the highest percentage is Ecolabel (National) Croatia, this can be attributed to the small number of products certified to date.

Table 4-5: Proportion of products under mandate M103 (insulation)

Scheme	Number of products certified under M103	Total certified products (all mandates and non-construction products)	% products under M103
Architettura Naturale (ANAB)	8	399	2%
BASTA	4,190	82,197	5%
Blue Angel	60 (licenses)	5,845	1%
BRE Global	36	3,188	1%
Cradle to Cradle	Unknown		
DGNB Navigator	11	217	5%
ECOproduct	Unknown		
EMICODE	Unknown		
Natureplus	0	222	0%
SundaHus Miljobyygard	1,655[6]	73,116	2%
Ecolabel (National) Austria	8	301	3%
Ecolabel (National) Croatia	1	12	8%
Ecolabel (National) Czech Republic	2	119	2%
Ecolabel (National) Hungary	0	63	0%

4.5 Concrete, Mortar and Grout

The content criteria for those schemes which have products that fall within the scope of the CEN mandate concrete, mortar and grout are shown in Table 4-6. Individual products include:

- bonding agents and mortar;
- fillers;
- plaster and renders;
- stone mortar;
- drain mortar;
- cement screed;
- calcium sulphate anhydrite screed;
- limestone, sand and calcium sulphate (binder screed);
- cement sulphate screed;
- fibre screed;
- ready mixed concrete;

[6] 1,030 – thermal insulation of houses and 625 – insulation of pipes, tubing and machinery

- concrete admixtures; and
- concrete release agents.

Product specific content criteria

Of the 13 schemes, only El Distintiu and Natureplus have specific criteria for this product group. More than 50% of the schemes refer to REACH, DSD or CLP in their criteria and many also make reference to heavy metals. As would be expected for concrete, mortar and grout products, additional criteria beyond REACH, DSD and CLPS such as phthalates and flame retardants are of little importance and are therefore not included in certification schemes.

Table 4-6: Specific content criteria for concrete, mortar and grout (M128)													
Scheme	**Specific criteria**	**REACH / DSD / CLP**	**Substances of very high concern**	**Environment – (ecotoxicity, biodegradability, potential for bioaccumulation, biocidal, HFC)**	**Heavy metals**	**POPS**	**Phthalates**	**Flame retardant**	**Nano-materials**	**TRGS**	**MAK Value**	**IARC Group**	**Other content criteria**
Architettura Naturale (ANAB)	No	Yes		Yes									Harmfulness to human health – no further details identified Radioactivity of product
Austrian Institute for Health and Ecological Building (IBO)	Unknown				Yes								
BASTA	No	Yes		Yes	Yes								Assessing criteria are also based on PRIO-guide
BRE Global	No			Yes									Human toxicity measured as kg 1,4-dichlorobenzene eq.
Cradle to Cradle	No				Yes		Yes	Yes					Banned chemical substances include: • halogenated polymers; • chlorinated hydrocarbons; and • polycyclic aromatic hydrocarbons.
DGNB Navigator	No				Yes								VOCs
ECOproduct	No	Yes											
EMICODE	No	Yes	Yes										Not permitted: • methylethylketoxim; and • methylisobutylketoxim.
GISCODE	Unknown	Yes											
Natureplus	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Content limits for: • metals and metalloids;

Table 4-6: Specific content criteria for concrete, mortar and grout (M128)													
Scheme	**Specific criteria**	**REACH / DSD / CLP**	**Substances of very high concern**	**Environment – (ecotoxicity, biodegradability, potential for bioaccumulation, biocidal, HFC)**	**Heavy metals**	**POPS**	**Phthalates**	**Flame retardant**	**Nano-materials**	**TRGS**	**MAK Value**	**IARC Group**	**Other content criteria**
													• eluate analysis; • organic compounds (AOX, PAH, phenol index, TOC); • pesticides • pH value; • asbestos fibres; and • radioactivity
SundaHus Miljobyygard	No	Yes		Yes	Yes								KIFS 2005:7
El Distintiu (the Catalonian Eco-label)	Yes	Yes		Yes (product group specific)	Yes								Limits for VOCs

Importance of concrete, mortar and grout to schemes

When considering the importance of concrete, mortar and grout products to the schemes, it is evident that schemes targeted towards professionals in the construction industry have more of a focus on these products. This can be seen in the percentages of schemes such as the Austrian Institute for Health and Ecological Building (IBO) (52 per cent), Natureplus (18 per cent) and the DGNB Navigator (10 per cent).

Table 4-7: Proportion of products under mandate M128 (concrete, mortar and grout)

Scheme	Number of products certified under M128	Total certified products (all mandates and non-construction products)	% products under M128
Architettura Naturale (ANAB)	21	399	5%
Austrian Institute for Health and Ecological Building (IBO)	54	103	52%
BASTA	1,385	82,197	2%
BRE Global	Unable to classify		
Cradle to Cradle	Unknown		
DGNB Navigator	22	217	10%
ECOproduct	Unknown		
EMICODE	Unknown		
GISCODE	Unknown		
Natureplus	40	222	18%
SundaHus Miljobyygard	Unable to classify		
El Distintiu (the Catalonian Eco-label)	7	866	1%

4.6 Roofing

The content criteria used by the schemes which can potentially cover the CEN mandate roofing is summarised in Table 4-8. Products within the scope of this mandate include the following:

- photovoltaic modules;
- roof tiles;
- roofing tiles (brick and concrete);
- roof sheet;
- roof and wall cladding;
- rain drainage system and sheets metal;
- roof slabs;
- roof slates;
- roofing and waterproofing system; and
- clay tiles.

Product specific content criteria

There is a somewhat even split between schemes that have specific product criteria and general product criteria. Just under half of the schemes refer to REACH, DSD or CLP within the criteria and as with the other product groups analysed in detail, heavy metals and environmental criteria are also important.

Table 4-8: Specific content criteria for roofing (M122)													
Scheme	**Specific criteria**	**REACH / DSD / CLP**	**Substances of very high concern**	**Environment – (ecotoxicity, biodegradability, potential for bioaccumulation, biocidal, HFC)**	**Heavy metals**	**POPS**	**Phthalates**	**Flame retardant**	**Nano-materials**	**TRGS**	**MAK Value**	**IARC Group**	**Other content criteria**
AENOR Medioambiente	Yes												It has not been possible to access further details on content criteria
Architettura Naturale (ANAB)	No	Yes		Yes									Harmfulness to human health – no further details identified Radioactivity of product
Austrian Institute for Health and Ecological Building (IBO)	Unknown				Yes								
BASTA	No	Yes		Yes	Yes								Assessing criteria are also based on PRIO-guide
BRE Global	No			Yes									Human toxicity measured as kg 1,4-dichlorobenzene eq.
Cradle to Cradle	No				Yes		Yes	Yes					Banned chemical substances include: • halogenated polymers; • chlorinated hydrocarbons; and • polycyclic aromatic hydrocarbons.
DGNB Navigator	No				Yes								VOCs
Milieukeur	Yes	Yes		Yes	Yes			Yes					VOCs must be <0.1% in adhesives. **Secondary rubber granulate** Carcinogenic substances are not permitted during the production process

Table 4-8: Specific content criteria for roofing (M122)													
Scheme	**Specific criteria**	**REACH / DSD / CLP**	**Substances of very high concern**	**Environment – (ecotoxicity, biodegradability, potential for bioaccumulation, biocidal, HFC)**	**Heavy metals**	**POPS**	**Phthalates**	**Flame retardant**	**Nano-materials**	**TRGS**	**MAK Value**	**IARC Group**	**Other content criteria**
													in pigments, anti-degrading substances, blowing agents, retarding agents and accelerators.
Natureplus	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Content limits for: • metals and metalloids; • eluate analysis; • organic compounds (AOX, PAH, phenol index, TOC); • pesticides • pH value; • asbestos fibres; and • radioactivity
Ecolabel (National) - Slovakia	Yes	Yes			Yes								Limited information identified.

Importance of Roofing to schemes

With the exception of ANAB, it would seem the percentage of products certified under a scheme that fall within the CEN mandate roofing is within the region of 7 and 13 per cent (Table 4 – 9). Whilst this figure would appear to be very low, as noted previously, this must be considered alongside the wide breadth of products that may be certified under these schemes. It is surprising to note that the Ecolabel (National) – Slovakia which targets consumers has the highest percentage of roofing products certified.

Table 4-9: Proportion of products under mandate M122 (roofing)

Scheme	Number of products certified under M122	Total certified products (all mandates and non-construction products)	% products under M122
AENOR Medioambiente	Unknown		
Architettura Naturale (ANAB)	3	373	1%
Austrian Institute for Health and Ecological Building (IBO)	7	103	7%
BASTA	5,435	82,197	7%
BRE Global	264	3,188	8%
Cradle to Cradle	Unknown		
DGNB Navigator	20	217	9%
Milieukeur	3	Unknown	
Natureplus	25	222	11%
Ecolabel (National) - Slovakia	15	118	13%

4.7 Adhesives

The final CEN Mandate considered covers adhesives, which includes products such as:

- pasty adhesives;
- ready to use thin fixations and adhesives
- powder based adhesives with high content of organic binder;
- adhesives for flooring;
- stone adhesive; and
- water soluble adhesives

Product specific content criteria

Almost half of the schemes have developed specific criteria for adhesives, some of which are targeted towards consumers and whist others target professionals. As with other product criteria discussed above, REACH, DSD or CLP are referenced in the content criteria of the majority of the schemes. Similarly, many of the schemes have requirements for heavy metals.

Table 4-10: Specific content criteria for adhesives (M127)													
Scheme	**Specific criteria**	**REACH / DSD / CLP**	**Substances of very high concern**	**Environment – (ecotoxicity, biodegradability, potential for bioaccumulation, biocidal, HFC)**	**Heavy metals**	**POPS**	**Phthalates**	**Flame retardant**	**Nano-materials**	**TRGS**	**MAK Value**	**IARC Group**	**Other content criteria**
Architettura Naturale (ANAB)	No	Yes		Yes									Harmfulness to human health – no further details identified Radioactivity Index I
Austrian Institute for Health and Ecological Building (IBO)	Unknown				Yes								
BASTA	No	Yes		Yes	Yes								Assessing criteria are also based on PRIO-guide
DGNB Navigator	No				Yes								VOCs
Eco-Institut Label	Yes	Yes		Yes (HFC)	Yes	Yes	Yes			Yes	Yes	Yes	Prohibited substances: • Organotin compounds • Antimony trioxide • Barium compounds (except barium sulphate) • Pyrethroids • Organophosphates • Organic halogen compounds
EMICODE	No	Yes	Yes										Not permitted: • Methylethylketoxim; and • Methylisobutylketoxim.
Natureplus	Yes and no Basic criteria and product-specific	Yes	Yes	Yes (HFC)	Yes	Yes			Yes		Yes	Yes	Prohibited: • Organotin compounds; • Antimony; and

Table 4-10: Specific content criteria for adhesives (M127)													
Scheme	**Specific criteria**	**REACH / DSD / CLP**	**Substances of very high concern**	**Environment – (ecotoxicity, biodegradability, potential for bioaccumulation, biocidal, HFC)**	**Heavy metals**	**POPS**	**Phthalates**	**Flame retardant**	**Nano-materials**	**TRGS**	**MAK Value**	**IARC Group**	**Other content criteria**
	requirements in some cases												• Organic halogen phosphates.
NF Environment	Yes												VOC – must be less than 30g per litre Hazardous substances are permissible in permitted quantities.
Ecolabel (National) Croatia	Yes	Yes		Yes (biocides)									No organochlorine or nitrogen compounds No VOCs with the exception of ethanol (up to 2%) Fungacidal agents up to 0.5%
Ecolabel (National) Czech Republic	Yes (adhesives and sealants)	Yes			Yes								Basic requirements relating to national legislation. Limits for VOCs, formaldehyde and solvents.

Importance of adhesives to schemes

The percentage of adhesive products certified under each scheme is particularly low (Table 4-11). However, this is perhaps influenced by the nature of the product. Unlike consumer products such as flooring, which will have a range of products with different performance characteristics (hard flooring, linoleum, carpet etc.); one adhesive product is likely to be suitable for a number of different products. For example, wooden floor adhesive is likely to be suitable for hard and soft wooden flooring.

Table 4-11: Proportion of products under mandate M127 (adhesives)

Scheme	Number of products certified under M127	Total certified products (all mandates and non-construction products)	% products under M127
Architettura Naturale (ANAB)	5	399	1%
Austrian Institute for Health and Ecological Building (IBO)	3	103	3%
BASTA	622	82,197	1%
DGNB Navigator	7	217	3%
Eco-Institut Label	4	275	1%
EMICODE	Unknown		
Natureplus	0	222	0%
NF Environment	0	Unknown	0%
Ecolabel (National) Croatia	0	12	0%
Ecolabel (National) Czech Republic	2	119	<1%

4.8 Conclusion

It would seem that most schemes targeted towards professionals who work in the construction sector have very general criteria. Whilst Ecolabels and schemes targeted towards consumers are likely to have more product specific criteria for particular construction products.

Of the 27 schemes identified which cover construction products, 15 have product group specific criteria whilst 10 have general criteria which are used for all products (the criteria for two schemes has not been identified). As would be expected, those schemes which use general criteria tend to cover more product groups than those which use product specific criteria (Table 4-12).

In terms of the range of products covered, most schemes would seem to cover a number of products. There are however four schemes that cover a single CEN mandate only, namely, AENOR Medioambiente, GUT, NF Environment and the European Ecolabel. However, with the exception of GUT, these schemes do not focus and specialise on one construction

product. Rather, these schemes cover a range of non-construction consumer products in addition to one single construction product group.

In terms of the content criteria, it is evident that REACH, DSD or CLP provide an important basis for many schemes, both in general and specific criteria. Substances which are known to be hazardous to human health and the environment are frequently explicitly banned or limited. These limits vary from scheme to scheme and certain types of products have more requirements than others. Whilst a list of the individually named chemicals has not been provided here, see Annex 2, it would appear that they are more numerous for flooring, than the other product groups. This could be linked to the intended use of the product, with flooring more likely to come into contact with the end user than insulation, roofing, concrete, grout and mortar and adhesives.

Table 4-12: Mandates covered vs. criteria type

Scheme	Mandates covered	Specific criteria
BASTA	21	No
Natureplus	13	Yes
Cradle to Cradle	11	No
DGNB Navigator	11	No
SundaHus Miljödata	11	No
ECOproduct	10	No
Architettura Naturale (ANAB)	9	No
Blue Angel	9	Yes
Austrian Institute for Health and Ecological Building (IBO)	8	?
BRE Global	8	No
Ecolabel (National) – Czech Republic	7	Yes
EMICODE	6	No
Ecolabel (National) - Austria	6	Yes
Ecolabel (National) - Hungary	6	Yes
El Distintiu (the Catalonian Eco-label)	5	Yes
GISCODE	4	?
Nordic Swan	4	Yes
EcoLabel (National) - Slovakia	4	Yes
Eco-Institut Label	3	Yes
Milieukeur	3	Yes
Ecolabel (National) - Croatia	3	Yes
AENOR Medioambiente	1	Yes
Association of Environmentally Friendly Carpets (GUT)	1	Yes
NF Environment	1	Yes
European Ecolabel	1	Yes
Byggvarubedömningen (BVB)	Unable to classify	No
Ecocycle Council (BPD3)	Unable to classify	No

Annex 1 Overview of Identified Schemes

Introduction

This section provides an overview of the main features of the schemes identified by this study (a more comprehensive overview of these schemes is given in Annex 2). Please note that this study focusses only on schemes that a) have established requirements that are specific to construction products and b) that consider the content of the product. However, due to the fact that only one scheme (BASTA) has been identified that focuses solely on the products' content, this section also considers dual schemes (i.e. those considering both the product's content and emissions)[7]. It is proposed that their inclusion might potentially provide the Commission with some useful insights into more generic issues associated with the design and running of construction product labelling and certification schemes. Similarly, this report considers schemes that have more than just construction products (as defined by the CPR) within their scope. In such cases, the number of construction products and non-construction products for which the label can be awarded are specified (where such information is available), thus providing an indication as to the relative importance of the scheme for the construction sector.

For each of the schemes the following aspects will be considered:

- its objectives;
- its geographical coverage;
- are the criteria used by the scheme focussed solely on product content or are emissions also taken into account;
- its scope in terms of the products for which criteria have been established;
- chemicals/substances that are regulated;
- procedures/requirements for assessing conformity to the scheme;
- the methods used for communicating conformity to the scheme;
- methods of ensuring objectivity/impartiality; and
- extent of the use of the scheme (numbers of products certified).

Objectives of the Schemes

The primary objectives of the vast majority (27) of the 30 identified schemes are much broader than just focussing on human health related considerations. Safeguarding the health of construction workers and users of construction products is the primary aim for only three schemes. Most schemes are motivated by a broader range of considerations, often including environmental concerns or sustainable development.

[7] On further examination, a number of certification and labelling schemes identified in the progress report for this study (submitted to the European Commission in April 2013) were deemed not to have criteria relating to the content of construction products and are therefore not considered in this report. These include CESAT, Environmental Product Declarations, VIBE, French VOC label, HQE, Indoor Air Comfort, Indoor Climate Label, LQAI, Total Quality Building, VERDE and Vinyl Plus.

Table A1.1: Objectives of the schemes		
Scheme	**Only human health considered?**	**Details (What is the primary objective of the scheme?)**
AENOR Medioambiente	No	The objectives of this scheme relate to environmental safety of products and service workers' safety
Architettura Naturale (ANAB)	No	ANAB-Certificato per la BIOEDILIZIA identifies construction products that have a reduced environmental impact, meet and provide assurance of compliance with the health and safety of end-users and workers
Association of Environmentally Friendly Carpets (GUT)	No	Make consumers aware of the carpets/textiles that will offer the best environmental and health protection throughout their lifecycle
Austrian Institute for Health and Ecological Building (IBO)	Yes	To provide information on the impact of buildings on human health and well-being
BASTA	Yes	Phase out the use of hazardous substances in construction products
Blue Angel	No	To promote products that score highly in respect of environmental and consumer protection
BRE Global	No	The scheme aims to provide a 'simple green' guide to the environmental impact of buildings products and materials.
Byggvarubedömningen (BVB)	No	Achieve 'a non-toxic environment', which seeks to almost eliminate non-natural and hazardous substances in newly manufactured finished products.
Cradle to Cradle	No	The scheme seeks to encourage innovation and continual improvement of products, so that their impacts on the environment and human health are minimal
DGNB Navigator	No	The scheme seeks to facilitate the planning and realisation of sustainable buildings by providing clear and unambiguous information about construction products.
Ecocycle Council (BPD3)	No	To enable the environmental assessment of building products in the project design/construction/use stage as well as in relation to future actions, such as demolition or waste management
Eco-Institut Label	No	Awarded to products with low emissions and low pollutants
ECOproduct	No	Provides information that allows users to select environmentally friendly construction products.
EMICODE	No	To promote consumer, occupational and environmental protection in the field of chemical construction materials and protection
GISCODE	Yes	To promote the protection of workers when dealing with chemical products in construction work.
Milieukeur	No	The label is awarded to sustainable products and services
Natureplus	No	To promote the use of those building and accommodation products which incorporate high levels of sustainability, in economic and social terms
NF Environment	No	The NF Environment mark is intended to certify, throughout their life cycle, that products or services to which it is applied have a lower impact on the environment than other products or services on the market, maintaining the use quality required.
Nordic Swan	No	Provide an environmental labeling scheme that contributes to sustainable consumption by evaluating the environmental impact of a product throughout its life cycle
SundaHus Miljödata	No	Hopes to encourage demand for products that present less of a hazard to the environment and health throughout their life cycle.

Table A1.1: Objectives of the schemes		
Scheme	**Only human health considered?**	**Details (What is the primary objective of the scheme?)**
BRE Environmental Assessment Method (BREEAM)	No	The scheme sets the standard for best practice in sustainable design, construction and operation and provides an overview of a building's environmental performance.
DGNB System	No	Promote solutions in the planning, construction and operation of buildings which realise the goals of sustainable development.
Eco Green Building	No	To ensure buildings conform to energy efficiency, indoor environment and material use requirements
European Ecolabel	No	Help guide the decisions of consumers when choosing more environmentally friendly products
Ecolabel (National) - Austria	No	Encourage products and services which are environmentally friendly and have fewer environmental impacts
El Distintiu (the Catalonian Ecolabel)	No	Provide users and consumers with better and more reliable information on the environmental quality of products and services
Ecolabel (National) - Croatia	No	The Environment Label promotes products that have a reduced environmental impact when compared to other equivalent products.
Ecolabel (National) – Czech Republic	No	The label encourages the uptake of products with a reduced environmental impact compared with products with the same or similar function.
Ecolabel (National) - Hungary	No	Identify to consumers those products that are environmentally friendly
Ecolabel (National) - Slovakia	No	To mitigate the negative environmental impact of consumption and production through the promotion of environmentally friendly products.

Geographical Coverage

Table A1.2 shows the origin and the coverage of the schemes, i.e. national, European or international and the main countries the scheme is being used in. Efforts have been made to get a broad overview of the geographical coverage of the schemes; however, this list is not exhaustive and the schemes may be in used in countries not listed.

Whilst many of the schemes are national and have been devised for use within the country of origin, others are being used in a number of European countries. The Blue Angel scheme is used in 21 European countries; this widespread use is perhaps not surprising given the scheme was the first of its kind and has been used as a basis for many of the more recent Ecolabels. DGNB System, EMICODE and Natureplus are also widely used.

Some 43% of these schemes originate from two countries; Germany (GUT, Blue Angel, DGNB System, DGNB Navigator, Eco-Institut Label, EMICODE, GISCODE and Natureplus) and Sweden (BASTA, BVB, Ecocycle Council, SundaHus and Eco Green Building). The Swedish parliament has an objective to achieve 'a non-toxic environment', which seeks to almost eliminate non-natural and potentially hazardous substances in newly manufactured finished products. This generates demand for construction products which do not contain hazardous substances and Swedish building contractors tend to demand products which have been

certified. Similarly, Germany has a strong market for products which are not hazardous to human health or the environment.

Table A1.2: Geographical coverage of the schemes			
Scheme	**Country of origin**	**Coverage**	**Countries also used in**
AENOR Medioambiente	Spain	National	
Architettura Naturale (ANAB)	Italy	National	
Association of Environmentally Friendly Carpets (GUT)	Germany	National	
Austrian Institute for Health and Ecological Building (IBO)	Austria	National	
BASTA	Sweden	National	
Blue Angel	Germany	International and Europe	• Austria; • Belgium; • Czech Republic; • Denmark; • Finland; • France; • Germany; • Greece; • Hungary; • Ireland; • Italy; • Luxembourg; • Netherlands; • Norway; • Poland; • Slovakia; • Slovenia; • Spain; • Sweden; • Switzerland; and • United Kingdom.
BRE Global	United Kingdom	International and Europe	• Czech Republic; • Denmark; • France; • Netherlands; and • United Kingdom.
Byggvarubedömningen (BVB)	Sweden	National	
Cradle to Cradle	United States/Denmark	International	• France; • Germany; • Netherlands; • Spain; and • Switzerland.
DGNB Navigator	Germany	International	
Ecocycle Council	Sweden	National	

Table A1.2: Geographical coverage of the schemes			
Scheme	**Country of origin**	**Coverage**	**Countries also used in**
(BPD3)			
Eco-Institut Label	Germany	International and Europe	• Austria; • Germany; • Italy; • Netherlands; and • Switzerland.
ECOproduct	Norway	National	
EMICODE	Germany	Europe	• Belgium; • Bulgaria; • Denmark; • France; • Germany; • Italy; • Netherlands; • Slovenia; • Spain; • Switzerland; and • United Kingdom.
GISCODE	Germany	Well known in German speaking countries	• Austria; and • Switzerland.
Milieukeur	The Netherlands	National	
Natureplus		International	• Austria; • Belgium; • France; • Germany; • Hungary; • Italy; • Lithuania; • Netherlands; • Switzerland; and • United Kingdom.
NF Environment	France	National	
Nordic Swan	Nordic countries	National offices in Denmark, Finland, Sweden, Iceland and Norway	
SundaHus Miljobyygard	Sweden	National	
BRE Environmental Assessment Method (BREEAM)	United Kingdom	International and Europe	• Germany; • Netherlands; • Norway; • Spain; and • Sweden.
DGNB System	Germany	International and Europe	• Bulgaria; • Greece; • Germany; • Luxembourg; • Denmark; • Czech Republic; • Austria;

Table A1.2: Geographical coverage of the schemes			
Scheme	**Country of origin**	**Coverage**	**Countries also used in**
			• Ireland; • Finland; • Iceland; • Italy; • Norway; • Poland; • Slovenia; • Spain; and • Hungary.
Eco Green Building	Sweden	National	
European Ecolabel	European Commission	Europe	• Italy; • France; • United Kingdom; • Netherlands; • Spain; • Sweden; and • Germany
Ecolabel (National) – Austria	Austria	National	
El Distintiu (the Catalonian Eco-label)	Catalonia	Catalonia and neighbouring areas	
Ecolabel (National) – Croatia	Croatia	National	
Ecolabel (National) – Czech Republic	Czech Republic	National	
Ecolabel (National) – Hungary	Hungary	National	
Ecolabel (National) – Slovakia	Slovakia	National	

Content vs. Emissions

As indicated in Table A1.3, the available information suggests that only one of the 30 identified schemes focuses solely on content-related requirements, this being BASTA. The majority of schemes rely on a mixture of content and emissions based approaches which are often product specific. Please note that due to a lack of information it was not possible to determine whether only content-based criteria are used for AENOR Medioambiente and the Czech Republic Ecolabel.

Table A1.3: Content vs. emissions		
Scheme	**Product safety assessment based on content only?**	**Details**
AENOR Medioambiente	Unknown	No information has been identified.
Architettura Naturale (ANAB)	No	This scheme considers both content and emissions.
Association of	No	This scheme considers both content and emissions.

Table A1.3: Content vs. emissions		
Scheme	**Product safety assessment based on content only?**	**Details**
Environmentally Friendly Carpets (GUT)		
Austrian Institute for Health and Ecological Building (IBO)	No	It is assumed this scheme also considers emissions.
BASTA	Yes	The scheme only looks at the content of products.
Blue Angel	No	This scheme considers both content and emissions
BRE Global	Yes	Whilst this scheme assesses the content and not emissions, the main focus of the assessment is on environmental impacts and sustainability.
Byggvarubedömningen (BVB)	No	There are criteria for content and where applicable indoor air emission limits.
Cradle to Cradle	No	Under the Material Assessment both the content and potential exposure are considered
DGNB Navigator	No	Where applicable, manufacturers must provide details on the content of harmful or dangerous substances and emissions which effect indoor air quality.
Ecocycle Council (BPD3)	No	This scheme requires that information is provided on the content of as well as emissions from the product.
Eco-Institut Label	No	Considers both content and emissions
ECOproduct	No	Considers both content and emissions
EMICODE	No	Considers both content and emissions
GISCODE	No	Considers both content and emissions
Milieukeur	Unknown	Products must have a lower environmental impact in terms of raw materials, energy and water use, pollution and packaging waste; and pay attention to aspects such as working conditions and conservation.
Natureplus	No	Considers both content and emissions
NF Environment	No	Considers both content and emissions
Nordic Swan	No	Considers both content and emissions
SundaHus Miljödata	No	This scheme considers the product's content as well as life cycle impacts on health and the environment.
BRE Environmental Assessment Method (BREEAM)	No	Covers buildings – however there are criteria for stipulating the use of BRE rated products and indoor emissions.
DGNB System	No	The presence of harmful or dangerous substances is considered under the 'Local Environmental Impact' criteria and emissions under the 'Indoor air quality' criteria.
Eco Green Building	No	Considers both content and emissions
European Ecolabel	No	Criteria include content and emission limits/requirements
Ecolabel (National) - Austria	No	Product group specific criteria – all have content criteria and some also have emission criteria
El Distintiu (the Catalonian Eco-label)	No	This scheme considers both content and emissions
Ecolabel (National) - Croatia	No	The product group criteria consider content and emissions, although there are considerably more restrictions in relation to content.
Ecolabel (National) –	Unknown	Unable to find any information.

Table A1.3: Content vs. emissions		
Scheme	**Product safety assessment based on content only?**	**Details**
Czech Republic		
Ecolabel (National) - Hungary	No	This scheme considers both content and emissions
Ecolabel (National) - Slovakia	No	There are specific criteria for each product group and includes the content of heavy metals and harmful substances and air pollution from production and use.

Product Groups Covered

Table A1.4 provides detailed information on the potential scope of the schemes. These broad product groups and categories have been sourced from the scheme websites and where appropriate similar groups have been amalgamated for conciseness. Please note that we have not been able to access the product databases for BPD3 and BVB; however, research has revealed that these predominantly focus on construction products.

The majority of schemes certify a wide range of products, however there is an exception with GUT which specialises in textile flooring coverings. The Ecolabels have been grouped together and whilst these do cover construction products, there is a strong focus on consumer products, such as clothing and cleaning products. Those schemes which certify buildings rather than products have not been included.

Table 4A1.4: Products covered by the schemes	
Scheme	**Products covered**
AENOR Medioambiente	• Paints and varnishes • Polyethylene bags and garbage bags • Petrographic machines • Photovoltaic modules • Classifiers • Paper labels and envelopes
Architettura Naturale (ANAB)	• Clay tiles, bricks, and thermo-insulating blocks • Natural stone products • Wood-cement, jacket-blocks and flooring products • Insulating products • Cast stone products • Plastering and masonry mortars • Ceramic tiles • Wood treatment products • Construction systems • Waterproofing roofing membranes
Association of Environmentally Friendly Carpets (GUT)	• Textile floor coverings
Austrian Institute for	• Wall building materials

Table 4A1.4: Products covered by the schemes	
Scheme	**Products covered**
Health and Ecological Building (IBO)	• Building slabs • Plaster and mortar • Mineral fillings • Screeds
BASTA	• Building materials • Wood products • Decoration materials and paint • Interior and joinery products • Fixing devices • Door furniture • Home security • Garden • Building components • Household items • Gas goods, fuel and explosives • Heating, ventilation and sanitation items, water supply and drainage items • Ventilation • Supplies
Blue Angel[8]	• Sanitary paper products made of recycled paper • Low-pollutant varnishes • Recycled paper • Products made from recycled plastics • Wallpapers and woodchip wall coverings primarily made of recycled paper • Low-emission wood products and wood-based products • Recycled cardboard • Printing and publication papers • Low-emission wall paints • Low emission floor covering adhesives and other covering materials • Office equipment with printing function • Textile floor coverings
BRE Global	• Upper floor construction • Ground floor construction • Internal walls • Windows • External wall construction • Insulation • Separating wall • Separating floor • Roof construction • Landscaping • Floor finishes
Byggvarubedömningen (BVB)	This scheme appears to cover construction products.
Cradle to Cradle	• Building materials • Interior design • Personal and home care • Paper and packaging

[8] There are 127 product groups, those with more than 100 products have been included

Table 4A1.4: Products covered by the schemes	
Scheme	**Products covered**
	• Textile and fabric • Other products
DGNB Navigator	• Doors, windows and window systems • Surface treatments and coatings • Ventilation systems • External wall cladding and façade systems • Interior walls, inner wall cladding and building boards • Mortars and screeds • Ceiling coverings and ceiling systems • Flooring and floor systems • Roofing materials and waterproofing systems • Water and wastewater systems • Lighting • Insulation • Metal building materials • Adhesives • Services e.g. engineering services, project management, facility services
Ecocycle Council (BPD3)	This scheme appears to cover construction products
Eco-Institut Label	• Construction products • Bedding • Mattresses • Furniture • Consumer goods • Floor coverings
ECOproduct	• Doors, windows and gates • Waterproof membranes • Insulation • Flooring • Wall coverings • Joint sealant/paste • Building boards and facades • Concrete, wood and steel • Furniture
EMICODE	• Liquid products • Mineral products e.g. cement and screeds • Pasty products e.g. adhesives • Ready for use products e.g. underlays, insulation boards • Joint sealants, joint insulations, joint sealing tapes • Surface coatings for wood flooring
GISCODE	• Flooring installation • Surface treatment agent for wood and parquet floors • Paints and coatings • Cleaning and care products • Cold processable bitumen waterproofing products • Epoxy coatings • Concrete admixtures • Methyl methacrylate coating materials • Concrete release agents • Polyurethane systems in construction

Table 4A1.4: Products covered by the schemes	
Scheme	**Products covered**
	• Wood preservatives • Acid protection • Corrosion protection products • Cementious products
Milieukeur	• Safety Tiles, in-situ floors and infill • Concrete cover, paving, curbs and tiles • Linoleum flooring • Agricultural/food and non-food products • Nursery products • Fire extinguishers • Green electricity
Natureplus	• Components • Floor coverings • Roof slates and tiles • Insulation (from renewable materials, mineral-based and composite insulation systems) • Mineral-based insulation • Paints and varnishes • Timber and wood materials • Adhesives and sealants • Masonry elements • Mortar and plaster renders and adhesives • Dry-wall construction boards • ETICS – Composite insulation system
NF Environment	• Furniture • Paint coatings • Paints, varnishes and related products • Universal colourants • Adhesives for flooring • Laser print cartridges • Individual garden composters • Stationery/paper (various) • Cleaning products • Products for professionals use (various) • Service renovation mechanical automotive articles • Domestics (various)
Nordic Swan	• Floor coverings • Chemical building products • Durable wood alternative to conventionally impregnated wood • Heat pumps • Panels for the building, decorating and furniture industry • Small houses, apartment buildings and pre-school buildings • Stoves • Solid Biofuel Boilers • Windows and exterior doors • Consumer goods/ location based services
SundaHus Miljödata[9]	• Thermal insulation

[9] There are 23 product groups, those with more than 1,000 have been included

Table 4A1.4: Products covered by the schemes	
Scheme	**Products covered**
	• Plastering, painting, protective coatings, wood preservation, concrete impregnation and anti-graffiti coatings • Floorings and wall tiles • House components e.g. windows, doors, stairways, balconies • Apparatus and pipes for piping and pipeline networks • Equipment, ducts, diffusers for ventilation and indoor climate systems • Electrical and telecommunications systems • Furniture and household appliances • Sealants for structural use in joints in buildings, fastening products
European Ecolabel	• Hard floor coverings • Indoor paints and varnishes • All-purpose cleaners and cleaners for sanitary facilities • Tissue paper • Textile products • Copying and graphic paper • Televisions • Soaps and shampoos • Hand dishwashing detergents • Tourist accommodation • Laundry detergents
Ecolabel (National) - Austria	• Building and living products • Office and print • Renewable energy and energy efficiency • Garden and garden products • Home • Mobility • Schools and educational institutions • Tourism and gastronomy
El Distintiu (the Catalonian Eco-label)	• Concrete products • Sanitary appliances • Masonry • Road construction products • Screeds, mortar and grout
Ecolabel (National) - Croatia	• Packaging • Wood flooring • Wood furniture • Products made from recycled material (various) • Free products • Toner cartridges • Paint and varnishes (waster based) • Adhesives (water based) • Thermal insulation
Ecolabel (National) Czech Republic	• Absorbants • Accommodation services for tourists • Adhesives and sealants (water soluble) • Cardboard and paperboard products, printed paper and mulch made from recycled paper • Cleaning and washing products and detergents • Aggregates

Table 4A1.4: Products covered by the schemes	
Scheme	**Products covered**
	• Furniture • Hardwood flooring • Office and administrative services • Paper bags and shopping bags • Plastic pipes • Textile products • Thermal insulation made from recycled paper • Water soluble paints • Wood and gas burning boilers
Ecolabel (National) - Hungary	• Stone-like building materials and building components, including concrete, clay, bricks • Environmentally friendly packaging • Chemically stabilized rubber bitumen products • Purpose and sanitary cleaners • Bituminous binder covers • Digital copiers • Gas-fired condensing boilers and standing wall system • Thermal insulation produced from mineral rock • Aerated concrete technology building components • Regular cleaning service using a micro-fibre fabrics • Soaps, shampoos and conditioners • Oil trap with selective filter • Fire-fighting equipment and fire extinguishers • Thermal solar systems • Ink Cartridges and Toner Cartridges
Ecolabel (National) - Slovakia	• Sanitary appliances • Roofing tiles • Cement • Universal sorbent material • Wire stone constructions

Table A1.6 provides the potential coverage of the schemes by standardisation mandate code, see Table A1-5. The information is an amalgamation of the above table, showing the broad product groups and Table A1.12, showing the number of certified products for each scheme. BRE Global, BPD3, BREEAM, DGNB System and Eco Green Building have not been included.

Table A1.5: CEN mandate codes	
Mandate code	**Title**
M100	Precast concrete products
M101	Doors, windows
M102	Membranes
M103	Thermal insulating products
M104	Structural bearings
M105	Chimneys
M106	Gypsum products
M107	Geotextiles

Table A1.5: CEN mandate codes	
Mandate code	**Title**
M108	Curtain walling
M109	Fixed fire-fighting equipment
M110	Sanitary appliances
M111	Circulation fixtures
M112	Structural timber products and ancillaries
M113	Wood based panels
M114	Cement
M115	Reinforcing steel
M116	Masonry
M118	Waste water disposal
M119	Floorings
M120	Structural metallic products
M121	Wall and ceiling finishes
M122	Roof coverings
M124	Road construction products
M125	Aggregates
M127	Adhesives
M128	Concrete, mortar and grout
M129	Space heating appliances
M131	Pipes, tanks NOT in contact with drinking water
M135	Glass
M/443	Power, control and communication cables
M/474	Sealants for non-structural use in joints in buildings and pedestrian walkways
M/489	External thermal insulation composite systems

BASTA is the most extensive scheme, covering 21 mandates, followed by Natrueplus which covers 13. The majority of the schemes cover 10 or less mandates and AENOR, GUT, NF Environment and European Ecolabel cover just a single mandate. Although it is important to note that these schemes mostly cover consumer products, with the exception of GUT which focuses on textile floor coverings.

'Floorings' (M119) is covered by the most schemes (19), followed by 'Insulation' (M103), 'Concrete, mortar and grout' (M128), 'Roofing (M122) and 'Adhesives' (M127). There are 2 mandates which no schemes have certified; 'Structural bearings' (M104) and 'Circulation fixtures' (M111).

Table A1.6: Construction products eligible for certification by standardisation mandate codes																										
Mandate	**AENOR Medioambiente**	**Architettura Naturale (ANAB)**	**Association of Environmentally Friendly Carpets (GUT)**	**Austrian Institute for Health and Ecological Building (IBO)**	**BASTA**	**Blue Angel**	**BRE Global**	**Cradle to Cradle**	**DGNB Navigator**	**Eco-Institut Label**	**ECOproduct**	**EMICODE**	**GISCODE**	**Milieukeur**	**Natureplus**	**NF Environment**	**Nordic Swan**	**SundaHus Miljödata**	**European Ecolabel**	**Ecolabel (National) - Austria**	**El Distintiu (the Catalonian Eco-label)**	**Ecolabel (National) - Croatia**	**Ecolabel (National) - Czech Republic**	**Ecolabel (National) - Hungary**	**Ecolabel (National) - Slovakia**	**Total schemes covering mandate**
M100				X	X			X										X			X			X		6
M101					X		X	X	X		X				X		X	X								8
M102		X		X							X				X											4
M103		X			X	X	X	X	X		X	X			X			X		X		X	X	X		14
M104																										0
M105																										0
M106				X	X										X					X						4
M107					X																					1
M108							X	X	X																	3
M109					X			X	X									X								4
M110					X																X				X	3
M111																										0

Table A1.6: Construction products eligible for certification by standardisation mandate codes																										
Mandate	**AENOR Medioambiente**	**Architettura Naturale (ANAB)**	**Association of Environmentally Friendly Carpets (GUT)**	**Austrian Institute for Health and Ecological Building (IBO)**	**BASTA**	**Blue Angel**	**BRE Global**	**Cradle to Cradle**	**DGNB Navigator**	**Eco-Institut Label**	**ECOproduct**	**EMICODE**	**GISCODE**	**Milieukeur**	**Natureplus**	**NF Environment**	**Nordic Swan**	**SundaHus Miljödata**	**European Ecolabel**	**Ecolabel (National) - Austria**	**El Distintiu (the Catalonian Eco-label)**	**Ecolabel (National) - Croatia**	**Ecolabel (National) - Czech Republic**	**Ecolabel (National) - Hungary**	**Ecolabel (National) - Slovakia**	**Total schemes covering mandate**
M112					X						X				X											3
M113				X	X	X	X				X				X		X			X						8
M114					X							X	X												X	4
M115					X																					1
M116				X				X							X			X			X			X	X	7
M118					X	X			X				X					X		X				X		7
M119		X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X			19
M120					X				X		X															3
M121		X			X	X	X		X		X															6
M122	X	X		X	X		X	X	X					X	X										X	10
M124																					X			X		2
M125					X																		X	X		3

Table A1.6: Construction products eligible for certification by standardisation mandate codes																										
Mandate	**AENOR Medioambiente**	**Architettura Naturale (ANAB)**	**Association of Environmentally Friendly Carpets (GUT)**	**Austrian Institute for Health and Ecological Building (IBO)**	**BASTA**	**Blue Angel**	**BRE Global**	**Cradle to Cradle**	**DGNB Navigator**	**Eco-Institut Label**	**ECOproduct**	**EMICODE**	**GISCODE**	**Milieukeur**	**Natureplus**	**NF Environment**	**Nordic Swan**	**SundaHus Miljödata**	**European Ecolabel**	**Ecolabel (National) - Austria**	**El Distintiu (the Catalonian Eco-label)**	**Ecolabel (National) - Croatia**	**Ecolabel (National) - Czech Republic**	**Ecolabel (National) - Hungary**	**Ecolabel (National) - Slovakia**	**Total schemes covering mandate**
M127		X		X	X				X	X		X			X	X						X	X			10
M128		X		X	X		X	X	X		X	X	X		X			X			X						12
M129						X											X			X			X			4
M131					X			X										X					X			4
M135								X																		1
M/443										X								X								2
M/474		X			X	X					X	X			X			X					X			8
M/489		X				X									X											3
Number of Mandates Covered	1	9	1	8	21	8	8	11	11	3	10	6	4	2	13	1	4	11	1	6	5	3	7	6	4	0

Substances Covered

Table A1.7 provides a summary of the substances or substance groups covered by the 30 schemes. The overwhelming majority of the schemes define the substances or substance groups that are restricted, whilst some refer to European legislation (most often to REACH and DSD/CLP) or national regulations (e.g. BASTA refers to substances regulated by the Swedish Chemicals Agency). Whilst the diverse nature of the schemes makes generalisations difficult, some substances and substance groups appear to be a popular target of many schemes. By way of example, these include:

- substances of very high concern;
- carcinogenic, mutagenic and reprotoxic substances;
- persistent organic pollutants;
- heavy metals;
- phthalates;
- VOCs.

Table A1.7: Substances considered by the schemes

Scheme	Substances covered
AENOR Medioambiente	No information has been identified.
Architettura Naturale (ANAB)	Substances are defined by their properties: carcinogenic, mutagenic, reprotoxic, radioactive, ecotoxic, biodegradable, bioaccumulative, contributing to global warming, acidification and eutrophication.
Association of Environmentally Friendly Carpets (GUT)	There is a list of substances which are banned or have been assigned limit values: • substances of very high concern; • persistent organic pollutants; • dyes, pigments and dyeing mill adjuvants (e.g. dichlorobenzenes); • heavy metals; • phthalates; • chlorophenols; • biocidal active substances; • formaldehyde; • wool finishes; • flame retardants; • polycyclic aromatic hydrocarbons; • inorganic fibres; • anti-soil and anti-stain finishes; and • vulcanisation accelerators.
Austrian Institute for Health and Ecological Building (IBO)	Not clear but includes heavy metals.
BASTA	Restrictions apply to substances with the following properties: • carcinogenic; • mutagenic; • toxic to reproduction; • effect during lactation; • endocrine disrupting; • persistent, bio accumulative and toxic organic compound; • very persistent and very bio accumulative organic compound;

Table A1.7: Substances considered by the schemes	
Scheme	**Substances covered**
BASTA	• lead; • mercury; • cadmium; • dangerous to ozone layer; • sensitising; • acute toxic; • acute toxic with danger of serious irreversible damage to health; • high chronic toxicity; • volatile organic compounds; and • dangerous for the environment.
Blue Angel	There are individual criteria for different product groups that state which substances are prohibited/must meet threshold requirements.
BRE Global	There are no specific criteria relating to substances, rather it is the effect on the environment and human health that is considered and assessed.
Byggvarubedömningen (BVB)	BVB has content limits for substances with certain properties, including: • very toxic; • toxic; • carcinogenic; • mutagenic; and • harmful to reproduction. To achieve the 'Recommended' classification some substances are not permitted, including: • arsenic and its compounds; • brominated flame retardants; and • organotin compounds Where applicable, emission limits apply to VOCs, TVOCs and formaldehyde.
Cradle to Cradle	There is a list of banned chemicals which are not permitted for intended inputs above a given threshold; these include chemicals belonging to the following groups: metals, flame retardants, phthalates, halogenated polymers, chlorinated hydrocarbons, polycyclic aromatic hydrocarbons.
DGNB Navigator	There are no specific criteria for products; rather it is the type of building which dictates the limits and permitted substances. Content criteria can include but are not limited to the following: • lead; • chromium and its compounds; • tin; • VOC; and • Cadmium. Emission criteria can include but are not limited to the following: • Formaldehyde; • TVOC; and • VOC.
Ecocycle Council (BPD3)	This scheme covers a number of substance groups, including CMR substances, corrosive, irritant, allergenic substances, lead, mercury and cadmium.
Eco-Institut Label	There is a list of prohibited substances and a list of substances that must meet threshold requirements. These include substances prohibited under EU and national legislation, substances with certain hazard and risk phrases, persistent organic pollutants, certain metals, organotin compounds, antimony trioxide,

Table A1.7: Substances considered by the schemes	
Scheme	**Substances covered**
	barium compounds (except barium sulphate), pyrethroids, HFCs, organophosphates, phthalates (except PET) and organic halogen compounds.
ECOproduct	Substances are identified with reference to the DSD/CLP.
EMICODE	Substances must not meet defined criteria under REACH, DSD/CLP.
GISCODE	Considering a large part of the information for the assessment comes from safety data sheets, it appears that substances covered to a large extent are those subject to national legislation and European legislation (e.g. REACH)
Milieukeur	There are specific criteria for each product group. Limits apply to substances with the following properties: • mutagenic; • teratogenic;, • carcinogenic; • toxic; • very toxic; • corrosive; and • harmful to the environment.
Natureplus	With reference to directive 67/548/EEC (transitionally being replaced by the CLP Regulation), there is a general list of prohibited substances. These are substances classified as carcinogenic, mutagenic or toxic to reproduction. There is also a special list of prohibited substances which again reference the CLP Regulation and Directive 67/548/EEC. These are substances that are suspected of being carcinogenic, causing mutations or toxic to reproduction, toxic or sensitizing or classified as harmful to the environment.
NF Environment	Examples of substances regulated include VOCs. Criteria also exist for "hazardous substances" but their definition is not known.
Nordic Swan	Each product group has its own content related criteria; please see Annex 2 for details.
SundaHus Miljödata	This scheme focuses on priority risk substances and other substances hazardous to health.
BRE Environmental Assessment Method (BREEAM)	Substances that are regulated by the Dangerous Substances Directive and substances that may damage human health; these include heavy metals, arsenic, chromium VI and regulated biocides. Criteria also include VOC emission thresholds for the various product groups.
DGNB System	No information identified but assessment includes consideration of indoor air quality and pollution control.
Eco Green Building	For gold award, buildings must not contain "phase-out" substances (as defined by KEMI). For silver award, phase out substances must not exceed defined thresholds.
European Ecolabel	Limits apply to substances which have the following properties: • very toxic; • toxic; • carcinogenic; • mutagenic; • toxic for reproduction; and • dangerous for the environment. Some substances are not permitted, including: • heavy metals; • plasticisers; • CFCs; and • halogenated organic compounds.

Table A1.7: Substances considered by the schemes	
Scheme	**Substances covered**
	There are emission limits, including for formaldehyde, SVOCs and TVOCs.
Ecolabel (National) - Austria	Substances regulated are the same as those regulated by the EU Ecolabel.
El Distintiu (the Catalonian Eco-label)	Toxic substance definition is taken from European legislation (REACH, DSD/CLP) or national or local legislation. Heavy metals are also considered. VOC content of the product or parts of the product (e.g. coverings) is also evaluated.
Ecolabel (National) - Croatia	The requirements are the same as those established by the EU Ecolabel.
Ecolabel (National) – Czech Republic	There are content limits for the following: • heavy metals; • formaldehyde; and • halogenated solvents The following are not permitted in some product groups: • halogen organic compounds; • plasticisers; and • lead, cadmium, chromium and their compounds. Emission limits exist in some product groups e.g. on formaldehyde.
Ecolabel (National) - Hungary	Criteria are fully harmonised with the EU Ecolabel requirements if the product group is also dealt with by the EU Ecolabel but additional criteria exist for products not listed under the EU Ecolabel.
Ecolabel (National) - Slovakia	Products containing chemical substances or mixtures meeting the criteria for classification as toxic, dangerous to the environment, carcinogenic or toxic to reproduction are not permitted.

Table A1.8 outlines the thresholds and prohibited substances classified under different schemes. It can be seen that many schemes make reference to REACH or the DSD/DPD/CLP. It would seem that many schemes contain an additional list of substances that are regulated, referencing either national legislation or specific substances.

Table 3.: References to EU and national legislation					
Scheme	**Content requirements**				
	Thresholds / Banned Substances Listed under REACH	**Thresholds / Banned Substances Listed under DSD/DPD/CLP**	**Thresholds / Banned Substances listed under EPD**	**Thresholds / Banned Substance Listed under National Legislation**	**Other Banned Substances / Content Requirements**
AENOR Medioambiente					
Architettura Naturale (ANAB)					

Table 3.: References to EU and national legislation					
Scheme	Content requirements				
	Thresholds / Banned Substances Listed under REACH	Thresholds / Banned Substances Listed under DSD/DPD/CLP	Thresholds / Banned Substances listed under EPD	Thresholds / Banned Substance Listed under National Legislation	Other Banned Substances / Content Requirements
Association of Environmentally Friendly Carpets (GUT)	Yes				Yes
Austrian Institute for Health and Ecological Building (IBO)					Yes
BASTA	Yes	Yes		Yes	
Blue Angel	Yes/No Product dependent	Yes/No Product dependent		Yes	
BRE Global					
Byggvarubedömningen (BVB)	Yes	Yes			Yes
Cradle to Cradle					Yes
DGNB Navigator			Yes		Yes
Ecocycle Council		Yes		Yes	
Eco-Institut Label		Yes		Yes	Yes
ECOproduct		Yes	Yes		
EMICODE	Yes	Yes		Yes	Yes
GISCODE	Yes			Yes	
Milieukeur					Yes
Natureplus	Yes	Yes		Yes	Yes
NF Environment	Yes	Yes		Yes	Yes
Nordic Swan	Yes	Yes			Yes
SundaHus Miljödata	Yes	Yes		Yes	Yes
BRE Environmental Assessment Method (BREEAM)		Yes			Yes
DGNB System					Yes
Eco Green Building				Yes	Yes
European Ecolabel	Yes	Yes			

Table 3.: References to EU and national legislation					
Scheme	Content requirements				
	Thresholds / Banned Substances Listed under REACH	Thresholds / Banned Substances Listed under DSD/DPD/CLP	Thresholds / Banned Substances listed under EPD	Thresholds / Banned Substance Listed under National Legislation	Other Banned Substances / Content Requirements
Ecolabel (National) – Austria	Yes	Yes			Yes
El Distintiu (the Catalonian Eco-label)	Yes	Yes		Yes	
Ecolabel (National) – Croatia	Yes	Yes			Yes
Ecolabel (National) – Czech Republic	Yes	Yes	Yes	Yes	
Ecolabel (National) – Hungary					
Ecolabel (National) – Slovakia	Yes	Yes			

Assessment Criteria/Procedures

Table A1.9 provides an overview of the approaches to assessing conformity taken by the 30 schemes. Broadly speaking, these schemes may rely on the following approaches:

- full or partial self-certification by the manufacturer (e.g. DGNB Navigator);
- examination of documents provided by the manufacturer, including application forms and safety data sheets by the scheme and subsequent approval/rejection of the application (e.g. GISCODE); this may involve requesting additional information from the manufacturer and may require that the manufacturer tests their products; and
- testing carried out by an independent body (e.g. ANAB).

While some of the schemes use only one of the above approaches, many rely on a combination of approaches, e.g. in the first instance, documentation provided by manufacturers is examined and subsequently independent tests of the product are undertaken.

Table A1.9: Testing/assessment undertaken by the schemes	
Scheme	Testing/assessment methods/criteria
AENOR Medioambiente	This involves both the provision of information by the manufacturer as well as an audit by AENOR (which might include testing of samples).
Architettura Naturale	This includes a preliminary assessment of products and testing, life-cycle

Table A1.9: Testing/assessment undertaken by the schemes	
Scheme	**Testing/assessment methods/criteria**
(ANAB)	assessment and an in-situ audit.
Association of Environmentally Friendly Carpets (GUT)	Carpets are tested in three main segments: • hazardous substances; • emissions; and • odour.
Austrian Institute for Health and Ecological Building (IBO)	They are tested against a range of criteria that take into consideration the life cycle of the product. Prior to testing, IBO makes a decision about the eligibility of the product based on information made available by the client. This is used to determine the nature of the initial test. Amongst other things, the initial test comprises an examination of toxicology and other factors relevant for the individual product.
BASTA	The manufacturer is responsible for providing documentation which demonstrates the product complies with the criteria. BASTA carry out audits using external auditors to ensure the requirements are being met.
Blue Angel	If there is an existing award, suppliers file applications to RAL – the label awarding agency. This board will review the application, allow the relevant Bundesland to comment and then conclude whether the product can bear the Blue Angel.
BRE Global	The assessment is made against human ecotoxicity and environmental impacts, including climate change, waste disposal and mineral resource depletion.
Byggvarubedömningen (BVB)	The assessment is based on building products declarations, MSDS, any certificate of subject content and other relevant information.
Cradle to Cradle	Assessment is carried out by the Cradle to Cradle team – material assessments are completed for each homogeneous material above 0.01% (or 100ppm). This includes chemical hazard profiling, exposure assessment, combined hazard and exposure assessment, cyclability assessment and compilation of the final rating.
DGNB Navigator	Manufacturers enter product information into the database. DGNB verify and quality assures the information before it is published.
Ecocycle Council (BPD3)	The assessment is carried out on the basis of information provided by the manufacturer.
Eco-Institut Label	Undertaken by eco-INSTITUT.
ECOproduct	Not applicable.
EMICODE	Undertaken by external test bodies that have the GEV test method chamber and are accredited according to ISO 17025.
GISCODE	Manufacturers and members companies of GISBAU voluntarily submit information that is used for the GISCODE.
Milieukeur	No information has been identified.
Natureplus	Products with the Natureplus label are assessed based on criteria relating to health, the environment and functionality. Products must have an above average level of safety performance in respect to the dangers posed to the health and environment by chemicals. To fulfil this objective, there are exclusion lists which indicate substances that must not be present within products associated with the Natureplus label. Conformity is verified by an independent third party.
NF Environment	The NF Environment certifies the conformity of products and / or services to the requirements specified in the standards of certification. Although it refers to standards, including specifications for suitability for use, the NF Environment is not a standard. Its specificity is to consider the environmental impacts throughout the life cycle of products, that is to say, to

Table A1.9: Testing/assessment undertaken by the schemes	
Scheme	**Testing/assessment methods/criteria**
	incorporate criteria that go beyond the scope of the technical specifications on the standards.
Nordic Swan	Depending on the product group and nature of the hazard, testing and assessment takes the form of: • manufacturers provide relevant declaration or data sheet (e.g. declaration that biocides are not used or Material Safety Data sheet); and • relevant tests by an impartial and competent test institution (e.g. for durable wood, the laboratory that performs the chemical analysis must meet the general requirements of EN ISO 17026 or be an official, GPL approved, analytical laboratory).
SundaHus Miljödata	Products are divided into 'chemical products' or 'other products' and assessed by collecting all available product documentation (e.g. safety data sheet, building product declarations).
BRE Environmental Assessment Method (BREEAM)	The assessment is carried out by a licensed organisation.
DGNB System	Testing is carried out by an independent auditor.
Eco Green Building	Assessment takes the form of registration, application, validation, decision, certification and then verification.
European Ecolabel	The manufacturer must provide a declaration of compliance along with safety data sheets in accordance with REACH.
Ecolabel (National) - Austria	Assessment is carried out by an independent body. Certification is valid for 4 years.
El Distintiu (the Catalonian Eco-label)	This includes an application by the manufacturer and an independent assessment.
Ecolabel (National) - Croatia	Assessment and award is carried out by a committee appointed by the Environment Minister.
Ecolabel (National) – Czech Republic	Assessment is carried out by the Agency for Environmentally Friendly Products and Services. Certification is awarded for 3 years.
Ecolabel (National) - Hungary	Conformity with the scheme is ascertained in a similar way to the EU Ecolabel process, conformity with the scheme can be ascertained with declarations, information received from suppliers, third party assessment and laboratory testing.
Ecolabel (National) - Slovakia	The Ministry of Environment administers the scheme, whilst the Slovak Environmental Agency Centre for Waste Management and Environmental Management provide professional and technical support.

Communicating Conformity

A brief overview of the methods used to communicate product conformity with consumers, developers and other users is given in Table A1.10. Two methods have been identified; displaying a logo or label and publication on the scheme website. Some 72% of schemes permit the use of a logo on the product, packaging or marketing material; in addition, certificates may also be awarded that provide further details. Research indicates that 61% of schemes publish information on certified products on their websites in some format. The

degree of sophistication varies considerably, from a simple list to a database which allows the user to search according to criteria.

Table A1.10: Methods of communicating conformity to users			
Scheme	**Details**	**Label/ certificate**	**Online database**
AENOR Medioambiente	Certified products, services and firms show the AENOR mark for products, services or companies.	X	
Architettura Naturale (ANAB)	Certified products, services and firms are awarded the ANAB-ICEA mark.	X	
Association of Environmentally Friendly Carpets (GUT)	Products that meet GUT criteria are awarded the GUT label which also contains a license number. Consumers can check the validity of the GUT license using this number.	X	
Austrian Institute for Health and Ecological Building (IBO)	Conformity is communicated by means of a label and a certificate. In addition, certified products are published on IBO's website, together with the dates of first certification and the certificate's expiry date.	X	X
BASTA	Products meeting the BASTA or BETA requirements are listed on the BASTA database, which is free to access online. The BASTA logo can be displayed on marketing material or product information sheets.	X	X
Blue Angel	The Blue Angel logo can be displayed on the product or packaging. Products are also displayed on the scheme website.	X	X
BRE Global	On completion of the profiling, applicants receive a certificate, a Certified Environmental Profile, a Green Guide rating (if the product type is covered in the Guide) and a report of the assessment findings. The products can also be accessed online via the Green Guide website.	X	X
Byggvarubedömningen (BVB)	All certified products are published on the subscription based database that allows users to identify and select construction materials that are good for the environment. Manufacturers are also permitted to display the logo on products.	X	X
Cradle to Cradle	Products which comply with the requirements are listed on the Cradle to Cradle website and are permitted to use the logo subject to terms of use.	X	X
DGNB Navigator	Products are listed in the online database which complements the DGNB System criteria. Manufacturers are also permitted to use DGNB Navigator logo which includes a unique registration number which relates to their product.	X	X
Ecocycle Council (BPD3)	Details of certified products are normally displayed on the manufacturer websites.		X
Eco-Institut Label	Conforming products carry the eco-INSTITUT label. Products are also awarded a certificate which can be viewed on the eco-INSTITUT website. This contains information on the tests program, test results and when the certification expires.	X	X
ECOproduct	The information gathered is used to present the products on a publically available database, which involves a grading system using green, white and red symbols.		X
EMICODE	The GEV-EMICODE label is affixed to products that comply to	X	

Table A1.10: Methods of communicating conformity to users			
Scheme	**Details**	**Label/ certificate**	**Online database**
	set criteria.		
GISCODE	Conformity is communicated in the following ways: • GISCODEs are provided on the product's label and in their safety data sheets; • 2-page summary of information about the product (including instructions on how to handle it) is provided (aimed at companies); • 1-page summary of the main information on the product (including instructions on how to handle it) is provided (aimed at construction workers); and • comprehensive database of information is provided by means of the Wingis system. This is a CD-ROM which is provided free of charge to member companies of the construction industry and contains data similar to an SDS on around 400 groups and more than 20,000 substances or products.	X	X
Milieukeur	List of certified manufacturers along with product details is available on the Dutch version of the website. Manufacturers are permitted to use the label on products.	X	X
Natureplus	Conformity is communicated by means of a label and publication on the Natureplus website.	X	X
NF Environment	Certified products can display the NF Environment Mark and can be found on the website using search functions, such a keywords, themes or type of certification.	X	X
Nordic Swan	The Nordic Ecolabel is affixed to products that comply with the requirements. Each license has a unique number which must always be displayed together with the logo.	X	
SundaHus Miljobyygard	Information on the potentially hazardous content of construction products and substances used to produce the construction product is communicated to subscribers of the SundaHus database through the use of arrows, symbols and parentheses. Other symbols indicate during which phase the health hazards occur. Many of the indicators have a corresponding negative or positive score.		X
BRE Environmental Assessment Method (BREEAM)	Certified buildings receive a BREEAM certificate and are also listed in the Green Book Live website.	X	X
DGNB System	Projects which have been awarded the DGNB label are listed on the DGNB website, which provides further details, including but not limited to: a detailed breakdown of the building evaluation results and site evaluation results. Certified projects are also permitted to use the logo which is Bronze, Silver or Gold.	X	X
Eco Green Building	A building can be awarded a Gold, Silver or Bronze certificate. A plaque is also awarded which may be installed in the building.	X	
European Ecolabel	Products and services awarded with the Ecolabel carry the flower logo, allowing consumers, including public and private	X	X

Table A1.10: Methods of communicating conformity to users			
Scheme	**Details**	**Label/ certificate**	**Online database**
	purchasers, to identify them easily. Certified products are also published on the EU Ecolabel website.		
Ecolabel (National) – Austria	Certified products are published on the Austrian Eco-label website and authorised to use the logo on products subject to terms of use.	X	X
El Distintiu (the Catalonian Eco-label)	The award of the Distinction authorises the use of the logo with certified products, services and firms showing the mark of "El Distintiu de Garantia de Qualitat Ambiental". The logo must specify the property or characteristic of the product or service that meets the environmental requirements and the relevant criteria as a legend.	X	
Ecolabel (National) – Croatia	Products are published on the Ministry of Environmental and Nature Protection website and are authorised to use the logo subject to terms of use.	X	X
Ecolabel (National) – Czech Republic	Products awarded the label are published on the Czech Environmental Information Agency website and are permitted to display the logo subject to terms of use.	X	X
Ecolabel (National) – Hungary	Products are published on the Eco-friendly product website and are authorised to use the trademark logo for 1 to 5 years.	X	X
Ecolabel (National) – Slovakia	Products awarded the label are listed on the Slovak Environmental Agency website and can display the logo on certified products.	X	X

Objectivity/Impartiality

Table A1.11 provides brief details on how the schemes ensure their assessment remains objective and impartial. Common themes which have emerged are:

- compliance with standards, such as ISO/IEC 17025, ISO14040 and ISO 14024;
- reliance on independent bodies for application assessment;
- the use of accredited laboratories for testing; and
- use of the precautionary principle, whereby in instances where there is a lack of information, this may result in products not being awarded the label or assuming they contain substances typical of the product type.

It is apparent that the schemes endeavour to provide a credible label which consumers, developers and other users can trust. However consultation suggests that not all stakeholders believe that every scheme is independent and have a standardised assessment methodology. Another issue highlighted was the unwillingness to discuss assessment results and the absence of a transparent and independent appeals procedure.

Table A1.11 Measures for ensuring objectivity and impartiality					
Scheme	**Scheme provider is independent, non-profit or government owned**	**Scheme operates in accordance with standards**	**Independent testing body**	**Worst case scenario assumed**	**Independent documentation used e.g. SDSs, EPDs**
AENOR Medioambiente	Applicants are required to submit information which is audited by AENOR before awarding the certificate.				
Architettura Naturale (ANAB)			An independent testing body (ICEA) carries out auditing and analysis of samples, which are either obtained during the audit or supplied by the applicant.		
Association of Environmentally Friendly Carpets (GUT)	No information found				
Austrian Institute for Health and Ecological Building (IBO)	IBO is a recognised and independent specialised institute. A comprehensive test report and a summary for consumers are published for all tested products.				
BASTA	BASTA has an independent, and long-term mandatorship through its principal owner IVL (Swedish Environmental Research Institute). BASTA is a non-profit company,				

Table A1.11 Measures for ensuring objectivity and impartiality					
Scheme	**Scheme provider is independent, non-profit or government owned**	**Scheme operates in accordance with standards**	**Independent testing body**	**Worst case scenario assumed**	**Independent documentation used e.g. SDSs, EPDs**
	which is important for credibility.				
Blue Angel	The scheme is owned by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.		Applications are reviewed and the label is awarded by the independent body RAL.		
BRE Global	BRE Global provides independent, third-party certification of environmental products and services.		BRE Global's status as a UKAS accredited laboratory reflects competence and impartiality.		
Byggvarubedömningen (BVB)				If applicants fail to provide adequate information, BVB take the worst case viewpoint and do not certify products.	Assessment is based on Safety Data Sheets and Building Product Declarations to ensure impartiality.
Cradle to Cradle			Accredited Assessment Bodies are used for testing, analysis and evaluation of applications and products. A list of bodies is available on the scheme website.		
DGNB Navigator	DGNB is a non-profit and non-governmental organisation which provides a degree of objectivity.				

Table A1.11 Measures for ensuring objectivity and impartiality					
Scheme	**Scheme provider is independent, non-profit or government owned**	**Scheme operates in accordance with standards**	**Independent testing body**	**Worst case scenario assumed**	**Independent documentation used e.g. SDSs, EPDs**
Ecocycle Council (BPD3)					Information provided is based on that supplied by the manufacturer of the relevant product.
Eco-Institut Label		Compliance with ISO/IEC 17025 accreditation ensures that the testing activities remain objective and impartial.			
ECOproduct					The information to evaluate the product is gathered from EPD documentation (EPD ISO 14025).
EMICODE			Testing laboratories must have a GEV test method chamber and be accredited according to ISO 17025.		
GISCODE	This scheme is run by BG BAU (the German institution responsible for statutory accident insurance and prevention in the construction sector) which is required by law to be neutral.				
Milieukeur	No information found				
Natureplus		Testing laboratories	All inspections and tests		The assessment is based

Table A1.11 Measures for ensuring objectivity and impartiality					
Scheme	**Scheme provider is independent, non-profit or government owned**	**Scheme operates in accordance with standards**	**Independent testing body**	**Worst case scenario assumed**	**Independent documentation used e.g. SDSs, EPDs**
		must conform to ISO EN 16000 for emission chamber tests.	are performed by independent, accredited laboratories.		on a manufacturer declaration.
NF Environment	The NF Network is a group of competent and impartial organisations that AFNOR Certification calls on to issue the NF Mark. AFNOR Certification and the NF Network are accredited by COFRAC.	The organisations meet standards NF EN 45011 or NF EN ISO/CEI 17025.			
Nordic Swan			Testing is undertaken by an independent laboratory.		Testing is based on documentation provided by the manufacturers.
SundaHus Miljobyygard				In accordance with the national objective of working towards a Non-Toxic Environment, if SundaHus receives only very general information about a product, the 'worst case' rule is applied. This means that a product is assessed as if it contains the health/environment agents that can occur in products of the same type.	
BRE Environmental	The final assessment report		BRE Global develops the		

Table A1.11 Measures for ensuring objectivity and impartiality					
Scheme	**Scheme provider is independent, non-profit or government owned**	**Scheme operates in accordance with standards**	**Independent testing body**	**Worst case scenario assumed**	**Independent documentation used e.g. SDSs, EPDs**
Assessment Method (BREEAM)	is audited by BRE Global for accuracy.		BREEAM methodology, trains and licenses independent BREEAM Assessors, who then conduct assessments against the methodology and certifies whether a project has met the requirements.		
DGNB System			The contractor enters into separate contracts with the auditor of their choosing and DGNB. There is no contractual relationship between the auditor and DGNB, which provides a degree of objectivity and impartiality.		
Eco Green Building			The validation is reviewed by independent specialists and reviewers. This is a confidential process, with all communication between the property owners and reviewers via the administrators.		
European Ecolabel			Within each State of the		

Table A1.11 Measures for ensuring objectivity and impartiality					
Scheme	**Scheme provider is independent, non-profit or government owned**	**Scheme operates in accordance with standards**	**Independent testing body**	**Worst case scenario assumed**	**Independent documentation used e.g. SDSs, EPDs**
			European Economic Area a competent, independent body is designated in order to ensure an objective and impartial assessment.		
Ecolabel (National) – Austria	No information found				
El Distintiu (the Catalonian Eco-label)			Applications are evaluated by technical staff and the Environmental Quality Council validates the assessment.		
Ecolabel (National) – Croatia		The criteria and testing assessment comply with ISO 14040 and 14024.			
Ecolabel (National) – Czech Republic	The scheme is administered by the Czech Environmental Information Agency (Cenia).	Information is obtained by Life Cycle Analysis which is carried out according to ISO 14040-49.			EPDs are used to ensure information supplied by applicants is objective, credible and neutral.
Ecolabel (National) – Hungary		Criteria and testing procedures comply with ISO 14024.			
Ecolabel (National) – Slovakia		The scheme follows the principles of the Type II eco-labelling which are standardised in the			

Table A1.11 Measures for ensuring objectivity and impartiality					
Scheme	**Scheme provider is independent, non-profit or government owned**	**Scheme operates in accordance with standards**	**Independent testing body**	**Worst case scenario assumed**	**Independent documentation used e.g. SDSs, EPDs**
		international standard ISO 14021.			
Total	10	7	12	2	6

Extent of Use of the Schemes (Products Certified)

Table A1.12 shows the extent of use of the schemes with regard to the number of certified products (for a summary of products covered by each mandate code please refer to Table A1.5 under the Product Groups Covered heading). This information has been sourced from the scheme websites, which is published in various formats and may not be exhaustive. Efforts have been made to compile the products into the mandates in order to allow a meaningful comparison between the schemes. Construction products which have no referenced material type or intended use were placed into the 'Other construction products' group; for example, miscellaneous sheet material.

There are several schemes which have not been included in this analysis. BRE Global and SundaHus use product groups which cannot be assigned to a particular mandate; they have 3,188 and 73,116 certified products respectively, more details can be found in Annex 2. The BVB database is not free to access; therefore it has not been possible to include this scheme but for comparison the website states that there are currently more than 7,000 construction products. Similarly, we have been unable to access this information for the Ecocycle Council; however they claim to have provided declarations for 4,000 – 5,000 products (2006 estimate).

It has not been possible to gather any information for AENOR Medioambiente, Cradle to Cradle or GUT. Those schemes which certify buildings, BRE Environmental Assessment Method, DGNB System and Eco Green Building have also not been excluded.

There are several schemes for which it was only possible to discern the product groups covered. As it is not possible to make a direct comparison these schemes have also been excluded, these are ECOproduct, EMICODE, NF Environment and Nordic Swan. This is also the case for Blue Angel which lists licenses on their website. It has only been possible to identify the number of construction products covered by Milieukeur, therefore this scheme is also absent from this analysis.

There is a large range in the number of products certified by each scheme, BASTA currently has more than 82,000 products on their database and the European Ecolabel has 17,754 products, whilst the Austrian Institute for Health and Ecological Building (IBO) has 103.

The proportion of certified products which are classified as construction products varies between the schemes. Just one scheme solely covers construction products, the Austrian Institute for Health and Ecological Building (IBO). A high proportion of certified products under BASTA, DGNB Navigator and Natureplus are construction products. Those schemes which cover a smaller proportion of construction products are typically the Ecolabels, with the exception of El Distintiu, the Nordic Swan and Eco-Institut label, all of which focus on consumers rather than the construction sector. It is worth noting that as paints and varnishes are not covered by the Construction Products Regulation and have been classified as a non-construction product, this has skewed the proportions.

Table A1.12 Total number of products certified under the scheme															
Mandate	Architettura Naturale (ANAB)	Austrian Institute for Health and Ecological Building (IBO)	BASTA	DGNB Navigator	Eco-Institut Label	GISCODE	Natureplus	European Ecolabel	Ecolabel (National) - Austria	El Distintiu (the Catalonian Eco-label)	Ecolabel (National) - Croatia	Ecolabel (National) – Czech Republic	Ecolabel (National) - Hungary	Ecolabel (National) - Slovakia	Total schemes certifying product in mandate
M100		5	18							8			2		5
M101			14,839	12			10								4
M102	1	1					60								4
M103	22		4,190	11					20		1	2			7
M104															0
M105															1
M106		27	181				1		3						5
M107			32												2
M108				27											2
M109			43	7											3
M110			309							642				10	3
M111															0
M112			53				11		10						4
M113		2	207				14								4
M114			692			2								2	4
M115			129												2
M116	1	1					29			3				4	6
M118			503	30											3
M119	4		6,620	28	41	27	10	6,250	71			1			10
M120			6,133	1											3

Table A1.12 Total number of products certified under the scheme															
Mandate	Architettura Naturale (ANAB)	Austrian Institute for Health and Ecological Building (IBO)	BASTA	DGNB Navigator	Eco-Institut Label	GISCODE	Natureplus	European Ecolabel	Ecolabel (National) - Austria	El Distintiu (the Catalonian Eco-label)	Ecolabel (National) - Croatia	Ecolabel (National) – Czech Republic	Ecolabel (National) - Hungary	Ecolabel (National) - Slovakia	Total schemes certifying product in mandate
M121	280		8,602	7											4
M122	3	7	5,435	20			25							15	7
M124						7				5					3
M125			155									1	5		4
M127		3	622	7	4							2			6
M128	57	54	1,385	22		10	40			7					8
M129												1			1
M131			2,098						2			10			4
M135															1
M/443					6										1
M/474			2,449												2
M/489							5								1
Other construction products	1	3	22,242	8	48	8				15		2	2		10
Non-construction products	4		5,260	37	176	246	17	11,504	240	186	11	100	54	87	14
Total products/licences	373	103	82,197	217	275	300	222	17,754	346	866	12	119	63	118	n/a
% Construction Products	98.9%	100%	94%	83%	36%	18%	92%	35%	31%	79%	8%	16%	14%	26%	n/a
% Non-construction Products	1.1%	0%	6%	17%	64%	82%	8%	65%	69%	21%	92%	84%	86%	74%	n/a

Annex 2 Labelling and Certification Schemes

AENOR Medio Ambiente (Spain)[10]

Introduction

The Spanish Association for Standardisation and Certification (AENOR) is a private non-profit organisation founded in 1986. The main objective of AENOR is to develop technical standards and certifications. AENOR Medioambiente is a voluntary accredited environmental assessment method for products, services and companies. AENOR's mark provides evidence of products claims and is a differentiating element in the market.

Objectives of the scheme

The objective of the scheme is to offer trust in the environmental safety of products and services and trust in the environmental commitment and workers' security of the company in question.

Geographical coverage

This scheme is mainly used in Spain. AENOR (as a standards and certification body) operates internationally and has permanent offices in 12 other countries mostly in Latin America and Europe and has issued certificates in more than 60 countries. AENOR in general is among the ten most important certification organisations in the world, but when referring to environmental certifications, the relative importance of AENOR is much smaller and these certifications are mainly used in Spain.

Focus of the scheme (content vs. emissions)

AENOR certifies products manufactured in Spain to suit UNE voluntary technical standards of ecological criteria. Certified products have undergone a life cycle analysis which ensures a reduced environmental impact when compared with other similar products.

Products covered

The label offers criteria for 11 product and service categories, most of which are consumer products. So far, AENOR has established the ecological criteria for several product categories including the following:

- paints and varnishes;

[10] Information obtained via direct telephone contact and http://www.aenor.es/aenor/certificacion/procesos/proceso_certificacion_aenor.asp

- polyethylene bags and garbage bags;
- petrographic machines;
- photovoltaic modules;
- classifiers; and
- paper labels and envelopes.

Substances covered (including award criteria)

Photovoltaic modules are regulated by the Spanish Standard UNE 206001 which sets out the award criteria and substance limits. This information is available from AENOR and typically covers the content of substances such as pentachlorophenol, organic solvent and the emission of substances such as formaldehyde.

Testing/assessment

The certificate is only obtained after AENOR has gained sufficient evidence that the criteria within the relevant standard have been met. The award procedure consists of the following steps:

- application for the certificate: the manufacturer completes and submits the application form along with supporting documentation. The Technical Committee of Certification (AENOR CTC) checks the completeness of the form and asks for extra information if necessary;
- award of certificate: AENOR carries out an audit to confirm that the product/service fulfils the requirements. If necessary, samples are taken and analysed. It may be necessary for the manufacturer to provide an action plan detailing how any shortcomings will be corrected; and
- maintenance of certificate: AENOR will perform audits on a regular basis to ensure that the product/service still fulfils the requirements.

Communicating conformity

The AENOR mark certifies that companies, products and services have been subject to controls and evaluations.

Objectivity/impartiality

All the information is audited by AENOR before the certificate is awarded.

Extent of use of the scheme

96 products have been awarded the AENOR Medioambiente label, however at present none of these are classified as a construction product. 294 services have also been awarded the label, 38% of which are paper and recycling centres but it is not clear whether any of them

recycle construction products. On the other hand, AENOR Medioambiente has also been awarded to almost 17,000 companies, of which around 25% are construction companies or construction product manufacturers.

Architettura Naturale (ANAB, Italy)[11]

Introduction

The National Association of Bio-ecological Architecture (ANAB) was the first Italian association in the field of sustainable buildings and was founded in 1989. ANAB coined the term 'Natural Architecture' relying on a widespread and growing environmental awareness to get a comprehensive bio-ecological approach. Certification began in 2004 thanks to an agreement with ICEA (Environmental and Ethical Certification Institute). This partnership offers transparency to users and companies and allows the development of environmentally friendly products for building and decoration. ANAB provides product standards, while ICEA performs certification activities and checks on materials and production processes.

Architettura Naturale certification testifies that construction products and materials:

- have a reduced impact on the environment;
- are produced with reduced air and water emissions and with low energy consumption; and
- reduce the risk of product emissions and thus improve indoor comfort for final users.

The certificate confirms that the products are compatible with building regulation criteria and with Green Public Procurement, which are inspired by sustainability principles.

Quality labels promoted by ANAB in collaboration with ICEA include:

- Certification of Eco-building Products; and
- Certification of Ecological Furniture and Furnishings.

For the purposes of this study, only the certification of construction products will be reviewed.

Objectives of the scheme

The Certification of Eco-building Products scheme identifies construction products that have a reduced environmental impact and meet the requirements for building materials provided as part of the certification and evaluation of buildings. It assures the health and safety of end-users and those who manufacture the product. The scheme is primarily targeted towards professionals, which is why many of the certified products are building materials. There are however products such as finishing products that are targeted towards consumers.

[11] Information obtained from http://www.anab.it/ (Certificazione Section) and http://www.icea.info/it/perche-bio/bio-edilizia

Geographical coverage

The ANAB mark is most prevalent in Italy, although construction products from Portugal (cork panels) and Belgium (insulation/roof panels) have been certified[12]. To some extent, ceramics manufactured in Italy that carry the ANAB label are also sold to markets outside of Italy.

Focus of the scheme (content vs. emissions)

ANAB label is awarded to ecological building materials which are:

- pre-production phase: obtained from renewable raw materials and/or mineral resources, preferably local;
- production phase: manufacturing processes of the product do not involve the use of hazardous substances for humans and the environment, minimize energy consumption and toxic emissions;
- phase of use: no emissions of known pollutants or dangerous substances which affect indoor air quality; and
- phase end of life: are disposed of in accordance with predetermined instructions[13].

Parameters relating to the manufacture of the product and use phases of the product are calculated using substance content and emissions, as well as the bioaccumulation and risks associated with these substances. Content criteria in the form of prohibited substances and thresholds are required, even if products will not emit these substances, because the scheme does not want the presence of these substances in products they certify. Whilst this scheme contains requirements for products during manufacture and for end use, it does not contain requirements for protecting contractors who may install these products. One reason given for this may be that it is difficult to control how a contractor will use a product (e.g. will they wear personal protective equipment)[14].

Products covered

The scheme covers the following construction products:

- clay tiles, bricks, and thermo-insulating blocks;
- natural stone products;
- wood-cement, jacket-blocks and flooring products;
- insulating products;
- cast stone products;
- plastering and masonry mortars;
- ceramic tiles;
- wood treatment products;

[12] Pers. Comm. 2013

[13] ICEA website: Improvement of the standard, accessed at http://old.icea.info/Aree/CertificazioniNoFood/BioEdilizia/Standard/tabid/69/Default.aspx

[14] Pers. Comm. 2013

- construction systems; and
- waterproofing roofing membranes.

There are some products within Italy that are closely associated with the ANAB label. For example, one of the major Italian clay tile manufacturers produces products that meet the ANAB criteria, which has resulted in about 60% of clay tiles in Italy carrying the ANAB label.

Substances covered (including award criteria)[15]

General criteria concerning the raw materials of construction products

The main parameters considered by the scheme are summarised in the following table.

Table A2-1: Substances covered by Architettura Naturale

Basic themes	Indicators
Damage to human health	Harmfulness to man of the product and its components (carcinogenic, mutagenic or toxic for reproduction)
	Radioactivity of the product (Radioactivity Index I)
Damage to the quality of the ecosystem	Harmfulness for the environment of the product and its components (ecotoxicity, biodegradability and potential for bioaccumulation)
	Greenhouse effect: calculated on the basis of the substances given off which contribute to the potential global warming of planet Earth (CO_2 eq.)
	Acidification: the acidification indicator is linked to its emissions into the air of specific substances, such as nitrogen oxides and sulphur oxides (mol H+/g max)
	Eutrophication: this indicator evaluates the eutrophication effect, i.e. the increase in the concentration of nutrients in aquatic environments (0_2/g max)
Damage to mineral and fossil resources	Consumption of renewable resources (kg and MJ)
	Consumption of non-renewable resources (kg and MJ)
	Impact of extraction

More specifically, there are general criteria related to the substances or compounds that may not be used, namely those that are:

- classified as an extreme risk or highly hazardous in the lists prepared by the World Health Organization under the International Program on Chemical Safety;
- carcinogenic, mutagenic or toxic to reproduction (CMR category 1 and 2);
- classified as persistent, bio-accumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB);
- banned or restricted by relevant European Community legislation; and

[15] ANAB (1 Feb 2012) General Standard for the Certification of Eco-Building Products and Materials, MAT_BIOEDIL.01 Ed.00 Rev.03

- have been assigned risk or hazard statements listed in Table A2-2 below.

Table A2-2: Health criteria for raw materials		
Risk Phrase	**Description**	
R26	Very toxic by inhalation	
R27	Very toxic in contact with skin	
R28	Very toxic if swallowed	
R39	Danger of very serious irreversible effects	
R45	May cause cancer	
R46	May cause heritable genetic damage	
R48	Danger of serious damage to health by prolonged exposure	
R49	May cause cancer by inhalation	
R60	May impair fertility	
R61	May cause harm to the unborn child	
Hazard Statement Code	**Description**	
H300	Acute toxicity (oral), Hazard Category 1, 2	Fatal if swallowed
H304	Aspiration hazard, Hazard Category 1	May be fatal if swallowed and enters airways
H310	Acute toxicity (dermal), Hazard Category 1, 2	Fatal in contact with skin
H330	Acute toxicity (inhal.) Hazard Category 1,2	Fatal if inhaled
H340	Germ cell mutagenicity, Hazard Category 1A, 1B	May damage fertility
H350	Carcinogenicity, Hazard Category 1A, 1B	May cause cancer
H350i		May cause cancer if inhale
H360F	Reproductive toxicity, Hazard Category 1A, 1B	May damage fertility
H360Df		May damage the unborn child. Suspected of damaging fertility.
H360FD		May damage fertility. May damage the unborn child.
H360Fd		May damage fertility. Suspected of damaging the unborn child.
H360D		May damage the unborn child
H370	Specific target organ toxicity – single exposure, Hazard Category 1	Causes damage to organs
H372	Specific target organ toxicity – Repeated exposure, Hazard Category 1	Causes damage to organs through prolonged or repeated exposure
H373	Specific target organ toxicity – Repeated exposure, Hazard Category 2	May cause damage to organs
EUH070	Toxic by eye contact	

In addition, substances or compounds must not be used in quantities that exceed 0.1% by weight of substances or compounds that have been classified as, or may be assigned when certification takes place, the risk phrases or hazard statement codes in Table A2-3.

Table A2-3: Health criteria for raw materials		
Risk Phrase	**Description**	
R40	Limited evidence of a carcinogenic effect	
R62	Possible risk of impaired fertility	
R63	Possible risk of harm to the unborn child	
R68	Possible risks of irreversible effects	
Hazard Statement Code	**Description**	
H351	Carcinogenicity, Hazard Category 2	Suspected of causing cancer
H361 fd	Reproductive toxicity, Hazard Category 2	Suspected of damaging fertility. Suspected of damaging the unborn child.
H361 f		Suspected of damaging fertility
H361 d		Suspected of damaging the unborn child
H362	Reproductive toxicity, Additional category, Effects on or via lactation	May cause harm to breast-fed children
H371	Specific target organ toxicity – Single exposure, Hazard Category 2	May cause damage to organs

For each substance or compound listed in the tables above, the applicant for certification must supply a recent SDS, not older than three years, that conforms to REACH.

Recycled Wood material

Recycled wood must not exceed the limit values for contaminants in table A2-4:

Table A2-4: Limit values for recycled wood		
Element or compound	**Limit Values (mg/kg)**	**Test methods**
Arsenic (As)	2	Disintegration + spectrometry by atomic absorption
Cadmium (Cd)	2	
Chrome (Cr)	25	
Copper (Cu)	20	
Lead (Pb)	30	
Mercury (Hg)	0.4	
Fluorine (F)	100	EN 24260
Chlorine (Cl)	600	
PCP	3	Extraction, derivatisation, analysis GC ECD prCEN./TR14823-03
Creosote	Not determined	Extraction + HPLC fluorescence

Criteria Concerning the Finished Product

The final product should not be classified as:

- carcinogenic (cat 1A, 1B and 2), mutagenic (cat 1A, 1B and 2) and toxic to reproduction (cat 1A, 1B and 2) under CLP;
- marked with the following risk phrases/hazard statement codes or combination thereof:
  - R50, R51, R52, R53, R54, R55, R56. R57, R58, R59
  - H400, H410, H411, H412, H413, H420
- the Radioactivity Index shall be $I \leq 1$.

Testing/assessment

The ANAB-ICEA certification is carried out in accordance with the ANAB-ICEA standards, which include the following steps:

Preliminary assessment of products and testing
for each product to be certified, documents such as SDS , EPD's will be assessed to determine that the product is adequate for its declared use, does not contain substances harmful to human health and the environment, is obtained mainly from easily renewable raw materials and secondary materials and has an environmental performance that has been optimised throughout its whole life cycle.

Life Cycle Assessment (LCA) of products, according to ISO 14040 standard
As part of the Certification of Eco-building Products, Life Cycle Analysis is used to define the environmental profile of products, identify the most critical areas within the life cycle, identify areas for improvement (reduction in resource consumption, emissions to air and water, waste production) and provide benchmarking with similar products and alternative products, if possible. By applying the LCA methodology, an environmental profile of the product is compiled which considers all flows of material and energy identified over the course of the entire life cycle of the product, and then sorted, classified and aggregated into different environmental impact categories, also called aggregated impact indicators.

In Situ Audit
The manufacturing processes are inspected, which includes all internal procedures that may compromise the product conforming to the requirements specified in the standard. The audit is extended to the health and safety management system and the environmental management system. Samples supplied by the applicant or obtained during the audit are analysed by ICEA through qualified external laboratories.

Certificates awarded to products last for three years. The testing of a product will be repeated if a manufacturer changes the product or the process by which it is manufactured. This retesting of a product has resulted in some products failing to meet the necessary standards, which has resulted in the manufacture having their ANAB certificate suspended.

As a founding member of Natureplus, the schemes are working together to harmonise the award criteria, so that products awarded the ANAB-ICEA label can also receive the Natureplus label and vice versa[16]. After the two schemes have successfully harmonised criteria, scheme organisers hope to develop a system whereby the scheme can be used alongside the EPD system.

Communicating conformity

Certified products, services and firms are awarded the ANAB-ICEA mark.

Objectivity/impartiality

The audit is performed by ICEA, during which samples may be taken which are analysed by ICEA through qualified external laboratories.

Extent of use of the scheme

As noted above, Natureplus and ANAB are working together to establish a single international scheme. Whilst Natureplus has a presence in Italy, this is marginal since there are only two companies in Italy that have products that carry the Natureplus label compared with 35 companies that have products that carry the ANAB label. Similarly, an Austrian company uses the Natureplus certificate for products that are marketed for Central Europe but will use the ANAB label for the same products that are marketed in Italy. There is thus a clear market demand for the ANAB label in Italy, which is reflected by its dominance within this sector. By way of example, it has been estimated that within the specific market of eco-certification in Italy, around 98% of the products possess the ANAB label. However, it must be remembered that this represents only a small proportion of the overall market, perhaps as little as one or two percent. Furthermore, it was reported that demand for these products has fallen since the onset of the economic crisis, with manufacturers primarily concerned with the cost of materials[17].

Table A2-5: Products certified under Architettura Naturale

Mandate	Type	Number of products	Products in scheme
M102	Membranes	1	Waterproofing roofing membrane (1)
M103	Thermal insulating products	22	Thermoinsulating clay blocks (2), Thermo-acoustic insulating products (4), Expanded insulating mineral products (16)

[16] ANAB website: Certification, accessed at http://translate.google.co.uk/translate?hl=en&sl=it&u=http://www.anab.it/testo/show/id/504e0352af377/Settore_Certificazione.html&prev=/search%3Fq%3DANAB%2B-%2BPRODOTTO%2BCERTIFICATO%2BPER%2BLA%2BBIOEDILIZIA%26biw%3D946%26bih%3D920

[17] Per. Comm. 2013

Table A2-5: Products certified under Architettura Naturale			
Mandate	**Type**	**Number of products**	**Products in scheme**
M116	Masonry	1	Cast stone products (1)
M119	Floorings	4	Clay tiles and bricks - flooring (3), Wood-cement jacket-blocks and flooring products (1)
M121	Wall and ceiling finishes	280	Natural stone products for walls and cladding (1), Ceramic tiles (279)
M122	Roof coverings	3	Clay tiles and bricks - roofing (3)
M128	Concrete, mortar & grout	57	Rendering/plastering and masonry mortars (57)
N/A	Other construction products	1	Construction systems (1)
N/A	Non-construction products	4	Wood treatment products (4)

Association of Environmentally Friendly Carpets (GUT, Germany)

Introduction

This scheme was established by leading carpet manufacturers in 1990.

Objectives of the scheme

The GUT label allows consumers to identify those carpets that will offer the consumer the best environmental and health protection throughout its life cycle.

Geographical coverage

There are 45 members of GUT, which are based in the following countries:

- Belgium;
- France;
- Germany;
- Netherlands;
- Switzerland; and
- United Kingdom.

Of course, many of these companies manufacture and sell carpets across Europe and indeed, worldwide.

Focus of the scheme (content vs. emissions)

There are three broad tests that a product must undertake to comply with GUT criteria, namely:

- hazardous substances;
- emissions (using the AgBB system); and
- odour[18].

Products covered

This scheme only covers textile floor coverings.

Substances covered (including award criteria)

Certain substances must not be used in the manufacture or production of the product or as a constituent of the final product. In accordance with the precautionary principle, there is a list of substances which are banned or have been assigned limit values under GUT. This will always take into account the latest scientific opinion. REACH guidelines and SVHC that are published by ECHA serve as a guide for substances that should be banned. For example, Persistent Organic Pollutants are prohibited from being used in GUT products. Other substances include those that have been classified as:

- substances of very high concern;
- dyes, pigments and dyeing mill adjuvants (e.g. dichlorobenzenes);
- heavy metals;
- phthalates;
- chlorophenols;
- biocidal active substances;
- formaldehyde;
- wool finishes;
- flame retardants;
- polycyclic aromatic hydrocarbons;
- inorganic fibres;
- anti-soil and anti-stain finishes; and
- vulcanisation accelerators[19].

Testing/assessment

18 GUT website: GUT Carpets tested for a better living environment, accessed at http://www.pro-dis.info/about_gut.html?&L=0

19 For details of specific substances, please see GUT website at: http://www.pro-dis.info/chemicals.html

Testing is performed by one of the testing institutes listed on the website.

Communicating conformity

Products that meet GUT criteria are awarded the GUT label which also contains a license number. Consumers can check the validity of the GUT license using this number.

Objectivity/impartiality

Only approved independent testing bodies can be used for sample testing, a list is available on the scheme's website.

Extent of use of the scheme

It has not been possible to discern any information regarding the total number of certified products or annual figures of certification.

Austrian Institute for Healthy and Ecological Building (IBO[20])

Introduction

IBO was founded in 1980 which the intention of informing people about the impacts of buildings on human health and the environment.

Objectives of the scheme

This scheme aims to assess the impacts of building materials and interior furnishings over their whole lifecycle[21]. Products that can be recommended from the point of view of building biology and building ecology are awarded the IBO test mark, which is valid for two years[22].

Please note that the scope of the scheme is intentionally limited. In a bid to curb the growing number of Ecolabels, preference is given to the Natureplus scheme and the IBO test mark can only be awarded to products for which no criteria exist under the Natureplus scheme[23].

[20] Österreichisches Institut für Baubiologie und –ökologie

[21] IBO website: Material Ecology and Product Testing, accessed at http://www.ibo.at/en/producttesting/index.htm

[22] Ibid.

[23] Ibid. and Label Online website: IBO – Prüfzeichen, accessed at http://www.label-online.de/label-datenbank?label=315

Geographical coverage

This appears to be a national scheme covering Austria.

Focus of the scheme (content vs. emissions)

The available information is not sufficient to determine whether content or emission-based criteria (or both) are used for products that undergo testing. However, considering that the scheme aims to prevent emissions and is based on a life-cycle approach, it is assumed that the scheme relies on both content and emissions-based criteria.

Products covered

This scheme applies to building materials and products as well as interior furnishings these include:

- wall building materials;
- building slabs;
- plaster and mortar;
- mineral fillings; and
- screeds[24].

Substances covered (including award criteria)

Limited information has been identified concerning the substances covered within the criteria, other than heavy metal limitations.

Testing/assessment

Prior to testing, IBO makes a decision about the eligibility of the product based on information made available by the client. This is used to determine the nature of the initial test. Among other things, the initial test comprises an examination of toxicology and other factors relevant for the individual product. Subsequent annual tests are performed to ensure the building/product continues to conform to the scheme.

The products are tested against a range of criteria that take into consideration the life cycle of the product. The product is then analysed from a holistic point of view. Testing criteria include heavy metal analyses and material tests.

The principles on which product testing is based include:

[24] IBO website: Materials Ecology and Product testing, accessed at http://www.ibo.at/en/producttesting/index.htm

- reducing resource consumption (e.g. through the use of building materials made from recycled or abundant renewable raw materials);
- waste reduction;
- avoidance of harmful emissions (e.g. by avoiding hazardous materials); and
- risk minimisation (e.g. use of manufactured products with low risk of failure)[25].

Communicating conformity

Conformity is communicated by means of a label and a certificate. In addition, a list of currently certified products is given on IBO's internet site, together with the dates of first certification and the certificate's expiry date.

Objectivity/impartiality

IBO is a recognised and independent specialised institute. A comprehensive test report and a summary are published for consumers for all tested products.

Extent of use of the scheme

A detailed overview of products covered by the scheme is provided below; this is based on product categories covered by standardisation mandates. Please note that this list may not be exhaustive.

Table A2-6: Products certified under Austrian Institute for Health and Ecological Building (IBO)[26]

Mandate	Type	Number of products	Products in scheme
M100	Precast concrete products	5	Concrete panels (2), Precast concrete slabs (2), Glass fibre reinforced concrete boards (1)
M102	Membranes	1	Air polyamide membrane (1)
M106	Gypsum	27	Plasterboard (16), Gypsum-lime machine plaster (2), Gypsum-lime cement machine plaster (1), Gypsum machine plaster (1), Gypsum cement plaster (1), Gypsum lime plaster (2), Gypsum-lime mortar (2), Gypsum compound (2)
M113	Wood based panels	2	Plywood (2)
M116	Masonry	1	Wall stone (1)
M122	Roof coverings	7	Concrete roof tiles (7)
M127	Adhesives	3	Ansetzbinder (1), Stone adhesive (1), Hydraulic binder (1)

[25] Label online website: IBO – Prüfzeichen, accessed at http://www.label-online.de/label-datenbank?label=315

[26] IBO website: Products with IBO test mark, accessed at http://www.ibo.at/de/produktpruefung/wand.htm

Table A2-6: Products certified under Austrian Institute for Health and Ecological Building (IBO)[26]			
Mandate	**Type**	**Number of products**	**Products in scheme**
M128	Concrete, mortar & grout	54	Fillers (8), Plaster and renders thin (11), Stone mortar (1), Drain mortar (1), Cement screed (16), Calcium sulphate anhydrite screeds (8), Limestone, sand and calcium sulphate (binder screed) (1), Cement sulphate screeds (3), Fibre screeds (4), Ready mixed concrete (1)
N/A	Other construction products	3	Expanded clay (1), Expanded glass granulate (1), Wall heating (1)

BASTA (Sweden)

Introduction

BASTA was developed by IVL (the Swedish Environmental Research Institute) and the Swedish Construction Federation and is a self-declaration of the content of a product. The scheme is predominantly used by professionals but as the database is free to access, it is also used by consumers.

Objectives of the scheme

The scheme seeks to phase out hazardous substances from construction products by providing an independent environmental assessment for building and construction products with the intention of protecting human health and the environment[27].

Geographical coverage

The scheme was developed for use in the Swedish market and the database used throughout Europe but mostly Sweden. Suppliers registering products on the database are global, but the majority are from Europe.

Focus of the scheme (content vs. emissions)

Products are required to meet criteria which relate to the chemical content, see Table A1-9 below, emissions from products are not assessed. Emission testing can be complicated and often requires external expert knowledge, therefore the exclusion of this criteria is a pragmatic approach aimed at easing the burden on product suppliers. In addition, according to the IVL, there is insufficient proof of the connection between general chemical

[27] BASTA website: About BASTA, accessed: http://www.bastaonline.se/english/bastaonline/aboutbasta.4.386979f513a1a34373978f.html

emissions and health effects in indoor environment[28]. In combination with a lack of legal support to obtain information from the suppliers and problems of determining which emissions should be presented and evaluated, this means that it is difficult to include chemical emissions in the general evaluation under the BASTA scheme.

Considering the precautionary principle, as emissions are directly linked to the content, if a substance is not present, it appears that there will be no emissions. However BASTA appreciate and acknowledge the importance of assessing the emissions from products and hope to introduce this aspect to the criteria in the future[29].

Products covered

BASTA predominantly covers construction products within the following categories:

- building materials;
- wood products;
- decoration materials and paint;
- interior and joinery products;
- fixing devices;
- door furniture;
- home security;
- garden;
- building components;
- household items;
- gas goods, fuel and explosives;
- heating, ventilation and sanitation items, water supply and drainage items;
- ventilation; and
- supplies.

BASTA estimate that overall they cover around 20% of the market in Sweden, with around 80-90% of the chemicals market (paints, glues and adhesives).

Substances covered (including award criteria)

Products can be certified against two levels of criteria; the more stringent BASTA register which is predominantly based on European and Swedish legislation and the Swedish Construction sector or the more basic BETA register which is derived mostly from European legislation. Applicants can choose which criteria to use, however almost all suppliers (98%) choose to meet the BASTA criteria[30]. Table A2-7 shows the substance properties which

[28] Pers. Comm. 2013
[29] Pers. Comm. 2013
[30] Pers. Comm. 2013

apply to each of the registers. Products on the BETA register must be accompanied by documentation showing which BASTA register criteria are not met, the potential environmental and health risks of these substances throughout the life of the product and precautionary measures which must be taken[31].

Table A2-7: Substance properties assessed under BASTA and BETA[32]		
Substance Property	**BASTA**	**BETA**
Carcinogenic	X	X
Mutagenic	X	X
Toxic to reproduction	X	X
Effects during lactation	X	X
Endocrine disrupting	X	X
Persistent, bio accumulative and toxic organic compound	X	X
Very persistent and very bio accumulative organic compound	X	X
Lead	X	X
Mercury	X	X
Cadmium	X	X
Dangerous to ozone layer	X	X
Sensitising	X	
Acute toxicity	X	
Acute toxic with danger of serious irreversible damage to health	X	
High chronic toxicity	X	
Volatile organic compounds	X	
Dangerous for the environment	X	

Products on the BASTA and BETA registers will not contain substances with properties according to agreed criteria, at concentrations equal to or above specified limits. These are based on:

- KIFS 2005:7 (Swedish Chemical Agency's Classification and Labelling Regulations); and
- Regulation (EC) No. 1272/2008 (classification, labelling and packaging of substances and mixtures)[33].

[31] BASTA (2011): Guidelines to registration of the BASTA system – For suppliers, manufacturers and importers, accessed: http://www.bastaonline.se/download/18.50367b6c13a6fda015212c6/1351500318514/Basta%2BGuidelines.pdf

[32] BASTA website: About BASTA, accessed: http://www.bastaonline.se/english/bastaonline/aboutbasta.4.386979f513a1a34373978f.html

[33] BASTA website: BASTA key documents, accessed: http://www.bastaonline.se/english/bastaonline/aboutbasta/keydocuments.4.386979f513a1a3437398a1.html

The assessing criteria are based on REACH Regulations (Regulation (EC) No. 1907/2006), the Council Directive 67/548EEC and on the PRIO-guide (database for risk reduction of chemicals from Swedish Chemicals Agency)[34]. Properties criteria documentation produced by BASTA has been reviewed and is presented in Table A2-8 below.

The properties criteria documentation also sets out the following guidelines:

- only concentrations for the product in the form it is delivered to site or otherwise need to be considered;
- the concentration of different substances with the same properties must be subject to summation; and
- for composite products, the concentration limits for each part must be calculated based on the weight of the individual part, not the whole article[35].

[34] BASTA (2012): Properties criteria – BASTA, Option 1 – according to KIFS 2005:7, accessed at http://www.bastaonline.se/download/18.50367b6c13a6fda01522a93/1354711809888/Basta+properties+criteria_opt1_2012.pdf

[35] BASTA website: BATSA key documents, http://www.bastaonline.se/english/bastaonline/aboutbasta/keydocuments.4.386979f513a1a3437398a1.html

Table A2-8: Properties criteria of BASTA-Register[36]					
Substance properties	**Definition according to option 1 (KIFS 2005:7)**	**Concentration limit (by weight)**	**Definition according to option 2 (Regulation (EC) No. 1272/2008)**	**Concentration limit (by weight)**	**Summation**
Carcinogenic	Substances with properties according to hazard class of carcinogenic in category 1 or 2 (R45, R49)	0.1%	Substances with properties according to hazard class of carcinogenic in category 1A or 1B (H350)	0.1%	-
	Substances with properties according to hazard class of carcinogenic in category 3 (R40)	1%	Substances with properties according to hazard class of carcinogenic in category 2 (H351)	1%	-
Mutagenic	Substances with properties according to hazard class of mutagenic in category 1 or 2 (R46)	0.1%	Substances with properties according to hazard class of mutagenic in category 1A or 2A (H340)	0.1%	-
	Substances with properties according to hazard class of mutagenic in category 3 (R68)	1%	Substances with properties according to hazard class of mutagenic in category 2 (341)	1%	-
Toxic to reproduction	Substances with properties according to hazard class of toxic to reproduction in category 1 or 2 (R60 and/ or R61)	0.5%	Substances with properties according to hazard class of toxic to reproduction in category 1A or 1B (H360)	0.3%	-
	Substances with properties according to hazard class of toxic to reproduction in category 3 (R62 and/or R63)	5%	Substances with properties according to hazard class of toxic to reproduction in category 2 (H361)	3%	-
Effect during lactation	Substances with properties according to hazard class of: may cause harm to breastfed babies (R64)	0.1%	Substances with properties according to hazard class of: may cause harm to breastfed children (H362)	0.3%	-
Endocrine disrupting	While awaiting criteria there may be no use of substances included in priority group 1 according	0.1%	While awaiting criteria there may be no use of substances included in priority group 1	0.1%	-

[36] BASTA website: BATSA key documents, http://www.bastaonline.se/english/bastaonline/aboutbasta/keydocuments.4.386979f513a1a3437398a1.html

Table A2-8: Properties criteria of BASTA-Register[36]					
Substance properties	**Definition according to option 1 (KIFS 2005:7)**	**Concentration limit (by weight)**	**Definition according to option 2 (Regulation (EC) No. 1272/2008)**	**Concentration limit (by weight)**	**Summation**
	to EU "candidate list of 553 substances" European Commission DG Environment (2000), Annex 1		according to EU "candidate list of 553 substances" European Commission DG Environment (2000), Annex 1 [4].		
Persistent, bio accumulative and toxic organic compound	Substances with a half-life > 60 days in seawater or > 40 days in freshwater or > 180 days in seawater sediment or > 120 days in freshwater sediment or >120 days in soil and BCF (Bio Concentration Factor) >2000 and Chronic NOEC < 0.01mg/l or < 30 mg/kg food or CMR or classified T; R48 or XN; R48 or R64	0.1%	Substances with a half-life > 60 days in seawater or > 40 days in freshwater or > 180 days in seawater sediment or > 120 days in freshwater sediment or >120 days in soil and BCF (Bio Concentration Factor) >2000 and Chronic NOEC < 0.01mg/l or < 30 mg/kg food or CMR or classified H372, H373 and H362	0.1%	-
Very persistent and very bio accumulative organic compound	Substances with a half-life > 60 days in seawater or freshwater or > 180 days in seawater or freshwater sediment or > 180 days in soil and BCF (Bio Concentration Factor) >5000	0.1%	Substances with a half-life > 60 days in seawater or freshwater or > 180 days in seawater or freshwater sediment or > 180 days in soil and BCF (Bio Concentration Factor) >5000	0.1%	-
Lead	Lead or compounds of lead	0.1%	Lead or compounds of lead	0.1%	Yes
Mercury	Mercury or compounds of mercury	Total Ban	Mercury or compounds of mercury	Total Ban	Yes
Cadmium	Cadmium or compounds of cadmium	0.01%	Cadmium or compounds of cadmium	0.01%	Yes
Dangerous to ozone layer	Substances with Ozone Depletion Potential (ODP) > 0 (R59)	0.1%	Substances with Ozone Depletion Potential (ODP) > 0 (EUH 059, H420)	0.1%	-
Sensitising	Substances with properties according to hazard class of causing sensitisation by inhalation and/or on skin contact (R42, R43)	1%	Substances with properties according to hazard class of causing respiratory sensitisation (H334)	0.2%	-

Table A2-8: Properties criteria of BASTA-Register[36]					
Substance properties	**Definition according to option 1 (KIFS 2005:7)**	**Concentration limit (by weight)**	**Definition according to option 2 (Regulation (EC) No. 1272/2008)**	**Concentration limit (by weight)**	**Summation**
			Substances with properties according to hazard class of causing skin sensitisation (H317)	1%	-
Acute toxic	Substances with properties according to hazard class of very toxic or toxic on inhalation, on skin contact and/or if swallowed (R23, R24, R25, R26, R27 or R28)	1 % for R26, R27 or R28 25 % for R23, R24,R25	Substances with properties according to hazard class of Acute toxicity in category 1, 2 and 3. (H300, H310, H330, H301, H311 or H331)	Based on acute toxicity estimates	Yes
Acute toxic with danger of serious irreversible damage to health	Substances with properties according to hazard class of very toxic or toxic: danger of serious irreversible damage to health by inhalation, on skin contact and/or if swallowed (R39 in combination with R23, R24, R25, R26, R27 and/or R28)	1 % for R26, R27 or R28 10 % for R23, R24, R25	Substances with properties according to hazard class of Causes damage to organs after single exposure (STOS-SE) in category 1. (H370)	1%	-
High chronic toxicity	Substances with properties according to hazard class of toxic: danger of serious irreversible damage to health in prolonged exposure by inhalation, on skin contact or if swallowed (R48 in combination with R23, R24 and/or R25).	10%	Substances with properties according to hazard class of Causes damage to organs through prolonged or repeated exposure (STOT-RE) in category 1. (H372)	1%	-
Volatile organic compounds	Substances with an initial boiling point < 250°C measured at a standard pressure of 101, 3 kPa and has properties according to the criteria for risk phrases: R20 (harmful by inhalation), or R23 (toxic by inhalation), or R65 (harmful: may cause	10%	Substances with an initial boiling point < 250°C measured at a standard pressure of 101,3 kPa and has properties according to any of the hazard classes: Fatal, Toxic and Harmful if inhaled (H330, H331, H332)	10%	Yes

Table A2-8: Properties criteria of BASTA-Register[36]					
Substance properties	**Definition according to option 1 (KIFS 2005:7)**	**Concentration limit (by weight)**	**Definition according to option 2 (Regulation (EC) No. 1272/2008)**	**Concentration limit (by weight)**	**Summation**
	lung damage if swallowed), or R67 (vapours may cause drowsiness and dizziness), or R48 together with R20 (harmful: danger of serious damage to health by prolonged exposure through inhalation).		Harmful if swallowed (H302) May cause drowsiness or dizziness (H336) May cause damage to organs (H371) or May cause damage to organs through prolonged or repeated exposure (H373).		
Dangerous for the environment	Substances meeting the criteria to be classified as very toxic to aquatic organisms (R50)	25% only if M=1	Substances with properties according to hazard class of Very toxic to aquatic life in acute category 1 (H400)	25% only if M=1	Yes
	Substances meeting the criteria to be classified as very toxic or toxic to aquatic organisms and may cause long term adverse effects on the aquatic environment (R50/53 or R51/53)	2.5% for just R50/53 substances M=1 25% for just R51/53 substances	Substances with properties according to hazard class of Very toxic to aquatic life in conical category 2 (H411) (also including substances with conical category 1 (H410))	2.5% for just H410 substances M=1 25% for just H411 substances	Yes
	Substances with properties according to hazard class of dangerous: may cause long-term adverse effects in the aquatic environment (R53) (Also including substances containing R50/53, R51/53 and R52/53)	25%	Substances with properties according to hazard class of Very toxic to aquatic life in conical category 4 (H413) (also including substances with conical category 1, 2 and 3 (H410, H411 and H412)	25%	Yes

Testing/assessment

A BASTA registration is a self-declaration that the contents of the product meet the properties criteria and as such suppliers are responsible for ensuring the information is correct. The manufacturer is responsible for providing a declaration of composition, whereby the name, CAS number (or equivalent) and proportional weight must be provided for each substance within the product (non-modified naturally occurring raw materials are exempt)[37]. The declaration must be accompanied by supporting documentation which shows that all components meet the criteria and the methods used to determine the absence of specified properties[38]. This can include Safety Data sheets or results from tests carried out on the substances e.g. data on effects on humans. Suppliers must also prove that the product assessment has been conducted by a person who is competent to assess health and environmental requirements. A self-declaration approach is favoured due to the relatively low costs for suppliers and is not time consuming.

If the producer does not have information on the constituent substances of the product or lacks data to determine whether a substance meets the properties criteria it cannot register in the BASTA system. There is the facility to provide a sub-supplier declaration form where necessary[39].

BASTA undertake regular audits with the assistance of external auditors which are competent and qualified chemists with expert knowledge in ecotoxicology. This is a continual process, although the number of audits for each supplier can vary from year to year and are not pre-arranged[40].

Each year, BASTA estimates that around 25-30% of suppliers receive an unannounced audit[41]. Within each audit, the supplier must demonstrate the criteria have been satisfied, overall competence and the documentation showing how the product was assessed. BASTA

[37] BASTA (2011): Guidelines to registration of the BASTA system – For suppliers, manufacturers and importers, accessed: http://www.bastaonline.se/download/18.50367b6c13a6fda015212c6/1351500318514/Basta%2BGuidelines.pdf

[38] European Commission: BASTA phases out dangerous substances from construction products, accessed at http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.showFile&rep=file&fil=LIFE03_ENV_S_000594_LAYMAN.pdf

[39] BASTA (2011): Guidelines to registration of the BASTA system – For suppliers, manufacturers and importers, accessed: http://www.bastaonline.se/download/18.50367b6c13a6fda015212c6/1351500318514/Basta%2BGuidelines.pdf

[40] Pers. Comm. 2013

[41] Pers. Comm. 2013

estimates that non-compliance is around 1 in 1000 products and suppliers have 3 months to rectify any non-conformities.

At present there is no product testing, largely due to the financial burden on suppliers, if necessary suppliers are requested to carry out testing on their product. However this is a possible area of development for the future.

Suppliers pay an annual subscription fee of around €1,700 which allows them to register an unlimited number of products. Smaller businesses can pay a reduced fee of around €1,400. There has been a steady rise in subscribed suppliers, with roughly 40-50 new suppliers joining the scheme per annum[42]. It is difficult to quantify the number of products added annually, as products can be removed and can fluctuate depending on the number of products each supplier registers, which can range from 100 – 1000+ products. BASTA have opted for this approach in order to build an extensive database for users, however this does increase the likelihood of out of production products remaining on the site.

Communicating conformity

Products meeting the BASTA or BETA requirements are listed on the BASTA database, which is free to access online. The BASTA logo can be displayed on marketing literature and in the accompanying information sheets. The scheme is not officially an Ecolabel and suppliers are not permitted to display the logo directly on products.

Objectivity/impartiality

BASTA has an independent and long-term mandatorship through its principal owner IVL (Swedish Environmental Research Institute). BASTA is a non-profit-driven company, which is important for credibility.

Extent of use of the scheme

There are currently more than 82,000 products on the register, with products on the BASTA register being listed first. In accordance with the definition being used for the purpose of this study, 94% of the products are classified as construction products, Table A2-9.

[42] Pers. Comm. 2013

Table A2-9: Products certified under BASTA			
Mandate	**Type**	**Number of products**	**Product in scheme**
M100	Precast concrete products	18	Building blocks and Aggregate (18)
M101	Doors, windows	14,839	Doors (92), Windows and glazed building elements (14,634), Room fittings (1), Locks and handles (34), Joinery fittings (78)
M103	Thermal insulating products	4,190	Insulation material (4,158), Pipes, valves, joints and fittings (32)
M106	Gypsum	181	Sheet material (181)
M107	Geotextiles	32	Pipes, valves, joints and fittings (32)
M109	Fixed fire-fighting equipment	43	Home security (43)
M110	Sanitary appliances	309	Kitchen joinery (103), Bathroom fittings (61), Bath, shower, WC and washing up (145)
M112	Structural timber products and ancillaries	53	Wood elements (53)
M113	Wood based panels	207	Sheet material (153), Timber (11), Timber based structural elements (2), Joinery fittings (41)
M114	Cement	692	Bonding agents and mortar (656), Sheet material (36)
M115	Reinforcing steel	129	Reinforcement, steel and metal goods (129)
M118	Waste water disposal	503	Installation systems (503)
M119	Floorings	6,620	Subfloor systems (107), Floor coverings (6,450), Garden items (55), Building blocks (8)
M120	Structural metallic products	6,133	Reinforcement, steel and metal goods (6,133)
M121	Wall and ceiling finishes	8,602	Ceramic goods (5,784), Wallpaper (185), Suspended ceiling and wall construction systems (434), Interior timber (846), Nails (587), Screws (220), Bolts, nuts and washers (8), Plugs and expansion bolts (520), Building blocks (18)
M122	Roof coverings	5,435	Roof and wall cladding (1,035), Secondary building elements (4,390), Suspended ceiling and wall construction systems (10)
M125	Aggregates	155	Building blocks and aggregate (155)
M127	Adhesives	622	Chemicals (622)
M128	Concrete, mortar & grout	1,385	Bonding agents and mortar (688), Building blocks and aggregate (140), Chemicals (557)
M131	Pipes, tanks NOT in contact with drinking water	2,098	Pipes, valves, joints and fittings (1,453), Hoses and hose fittings (16), Installation systems (629)

Table A2-9: Products certified under BASTA			
Mandate	**Type**	**Number of products**	**Product in scheme**
M/474	Sealants for non-structural use in joints in buildings and pedestrian walkways	2,449	Sealing systems, tape and weather strip (887), Chemicals (1,120), Ceramic goods (442)
N/A	Other construction products	22,242	Sheet material (119), Secondary building elements (933), Room fittings (320), Built in storage (34), Building blocks (381), Boiler, pumps and floor traps (4), Pipes, valves, joints and fittings (46), Ventilation (20,405)
N/A	Non-construction products	5,260	Chemicals (536), Floor coverings (21), Paints and wood finishes (3,565), Home security (870), Garden items (48), Cleaning items (51), Explosives (5), Fuel (1), Industrial consumables (163)

Future developments

BASTA envisage 2 areas for potential development whilst ultimately upholding the aim of the Swedish Government to create a 'non-toxic environment'. The first development would be the expansion of the BASTA database to other European countries, most notably the Nordic countries, UK, Germany and France[43]. This has been restricted so far by the limited funds and the relative size of the company. There are also plans to introduce new 'tools' to help further the scheme's objective, which may include a database which has criteria for emissions and content[44]. The scheme is well placed for such an initiative as the IVL Swedish Environmental Research Institute has expertise in the field and they already have researchers working on emissions from products. The project tool is a development aimed at professional construction companies, 800 to date, which can document the products being used on a particular project.

With regards to actions by the European Commission (EC) in response to the Construction Product Regulation, BASTA believe that the EC are ideally positioned to introduce or develop existing legislation which obliges sub-suppliers to provide information on content upon request. Sub-suppliers are not limited to Europe; therefore the measure would need to apply to all imports.

[43] Pers. Comm. 2013
[44] Pers. Comm. 2013

Blue Angel (Germany)

Introduction

The Blauer Engel (Blue Angel) is an eco-labelling scheme operated by a consortium of German governmental and non-governmental agencies.

Objectives of the scheme

It is awarded to products and services which have a reduced environmental impact, are fit for purpose and pose no threat to the health of workers and users.

Geographical coverage

The Blue Angel was founded in Germany. Although primarily a national scheme, the German Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) has funded the project 'Strengthening the International image of the Blue Angel as a Climate Protection Label'. However, more may need to be done to increase international coverage, as one stakeholder noted that the Blue Angel is only accepted by the private consumer in Germany and is less accepted by professional crafts due to quality aspects. At present, 1,380 suppliers have concluded a contract on the use of Blue Angel, of which, 22% are foreign suppliers[45].

Focus of the scheme (content vs. emissions)

Blue Angel acknowledges that a wide range of products may cause environmental impacts throughout their entire life cycles. For this reason, compliance criteria consider:

- materials and substances that are used during manufacture;
- the final content of the products (i.e. some substances, pigments and dyes must not be present);
- whether the emissions of the product is acceptable – which is why the Blue Angel serves as a good measure to distinguish comparably low emitting products; and
- that the product does not contain substances that may hinder recycling or disposal.

Products covered

The Blue Angel scheme covers a wide range of products and is predominantly focused on the office sector. Certified products are categorised as follows:

- sanitary paper products made of recycled paper;

[45] Blue Angel website, Blue Angel International, accessed at http://www.blauer-engel.de/en/blauer_engel/international/index.php

- low-pollutant varnishes;
- recycled paper;
- products made from recycled plastics;
- wallpapers and woodchip wall coverings primarily made of recycled paper;
- low-emission wood products and wood-based products;
- recycled cardboard;
- printing and publication papers;
- low-emission wall paints;
- low emission floor covering adhesives and other covering materials;
- office equipment with printing function; and
- textile floor coverings.

Substances covered (including award criteria)

Table A2-10 overleaf outlines the core criteria for different construction products certified by the Blue Angel. In particular, there is a focus on those requirements related to the content of potentially hazardous substances but where relevant there are also emission requirements. New criteria for additional products emerge every year and are developed by the Federal Environment Agency in cooperation with consumer associations and organisations that undertake testing. For example, the scheme has introduced the following categories in 2012 and 2013 respectively, although they currently do not have any certified products:

- doorbell and intercom systems and associated power supply units; and
- low emission interior floor coverings, panels and doors made of wood and wood based materials[46].

[46] Blue Angel website: Survey of all Basic Award Criteria, accessed at http://www.blauer-engel.de/en/products_brands/survey_basic_award_criteria.php

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
RAL-UZ 32: Water-saving flushing boxes[48]	Flushing boxes, including those that do not fall within the scope of DIN 19542 due to small flushing-water volume					
RAL-UZ 35: Wallpapers and woodchip wall coverings primarily made of	Wallpapers made of wallbase paper according to DIN 6730 and woodchip wallpapers according to DIN 6730	Carcinogenic, Mutagenic and harmful to reproduction.	Classified according to TRGS 905 as amended as carcinogenic, mutagenic or teratogenic substances.	Carcinogenic or suspected of having a carcinogenic potential according to MAK III1, III2, III3 or according to EC category Carc.Cat1, Carc.Cat2 or Carc.Cat3.	Products must be made without the use of glyoxal, formaldehyde, sodium hexafluorosilicate'. N-(a-(1-nitroethyl)benzyl)-ethylene diamine, mixture of tris-(hydroxymethyl)-	Content of releasable formaldehyde in the final product must not exceed 8mg per 100g of abs dry wallpaper.

[47] German Technical Rules for Hazardous Substances represents a list of substances that, on conclusive scientific information, have been classified as being carcinogenic, mutagenic or teratogenic. Substances listed under TRGS 905 will not be included under Appendix I of Directive 67/548/EEC. However, substances for which the Committee for Hazardous Substances has decided on a classification in derogation of Directive 67/548/EEC may be included. Accessed at: http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DTRGS%2B905%26client%3Dfirefox-a%26hs%3Dhcn%26rls%3Dorg.mozilla:en-GB:official&rurl=translate.google.co.uk&sl=de&u=http://www.baua.de/de/Themen-von-A-Z/Gefahrstoffe/TRGS/pdf/TRGS-905.pdf%3F__blob%3DpublicationFile%26v%3D3&usg=ALkJrhijjIWu7HK04n5dGFMoj8LW4zbU6w

[48] For more information consult criteria on Blue Angel website, which can be accessed at http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=255

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
recycled paper[49]					nitromethane, 5-chloro-2-methyl-4-isothiazoline-3-on and 2-methyl-4-isothiazoline-3-on, tetramethylthiuran disulphide Lead 20mg/kg Chromium VI 20mg/kg Arsenic 3mg/kg Cadmium 3mg/kg Mercury 2mg/kg.	
RAL-UZ 38: Low-emission wood products and	Furniture and slated frames Products comprised mostly of renewable material (i.e. more	Very Toxic Toxic Carcinogenic	Carcinogenic (EC Category Carc.Cat 1 or Carc.Cat. 2or K1 or K2, or MAK classification III1 or III2) Mutagenic (EC Category			Emission limits for: • formaldehyde; and • VOC

[49] For more information consult criteria on Blue Angel website, which can be accessed at http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=145

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
wood base products[50]	than 50% of wood)	Mutagenic Teratogenic	Mut.Cat 1 or Mut.Cat. 2 or M1 or M2) Teratogenic (EC Category Repr. Cat 1 or Repr. Cat 2 or $R_{E/F}1$ or $R_{E/F}2$)			
RAL-UZ 76: Low-emission composite wood panels[51]	Chipboards, composite wood panels, fibreboards, medium density fibreboard, veneer plywood, solid wood boards and orientated strand boards Chipboards that are not weight heaving					Emission limits for: • Formaldehyde; • monomer MDI; and • phenol. Wood preservatives and halogenated organic compounds may not be added to wood panels and their coatings

[50] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/_downloads/vergabegrundlagen_en/e-UZ-038.zip

[51] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/_downloads/vergabegrundlagen_en/e-UZ-076.zip

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
RAL-UZ 111: Wood Pellet Stoves[52]	Wood pellet stoves according to DN 18894 or DIN EN 14785 with a nominal heat output up to and including 15kW exclusively designed for the use of wood pellets					
RAL-UZ 112: Wood pellet boilers and wood chips boilers	Boilers according to DIN EN 303-5. Including boilers with a nominal heat output up to and including 500kW exclusively designed and approved by the manufacture for the use of the wood pellets and/or wood chips					
RAL-UZ 113: Low emission	Solvent-free adhesives – according to TRGS	Substances listed under Annex I to Directive and under Ordinance on		Carcinogenic working materials (Category 1, 2, or 3)	Polymer emulsions, resins or comparable components: Are prohibited from containing	VOC emissions must meet strictly defined limits

[52] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=218

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
floor-covering adhesives and other covering materials[53]	610 - (e.g. emulsion adhesives according to DIN EN 923, powdered adhesives and fixing materials), cement containing surfacers and calcium sulphate-based surfacers intended for use as installation Materials in indoor environments, adhesive tapes, films for holohedral adhesion of floor coverings and floor covering adhesives based on silane modified polymers Note: excluded from	Hazardous Substances with the following must not be in the product: Very Toxic (T+) Toxic (T) Carcinogenic (EC Category Carc. Cat 1, 2 or 3) Mutagenic (EC Category Mut.Cat 1, 2 or 3) Reprotoxic (EC Category Repr. Cat 1, 2 or 3)		Germ-cell mutagenic working materials (Category 1, 2, 3A or 3B) Teratogenic working materials in column 'pregnancy in Group A or B)	oxidizable fatty acids or oxidizable fatty-acid esters as constituent components Products that contain alkyl phenol ethoxylates must not be added to any products within the scope of RAL-UZ 113 that bear the Blue Angel Plasticising substances (phthalate class) may not be used to manufacture SMP adhesives With the exception of dibutyl tin compounds, products may only contain those organotin compounds that are listed in the Ordinance on Food and Other Commodities. Furthermore, if a catalyst is	Formaldehyde and acetaldehyde emissions must be met

[53] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=114

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
	this criteria are: Wallpaper pastes, tile adhesives and joint fillers				used, impurities of tributyl and dibutyl tin compounds must not exceed 0.1% The product must also not contain any biocides	
RAL-UZ 115: Low solvent roof coatings and bitumen adhesives[54]	Low solvent roof coverings, low solvent coatings for protection of usual mineral substrates in civil engineering and low solvent cold adhesives for full surface bonding of bitumen strips to protect the roof from moisture penetration.	Substances marked as very toxic (T+) or toxic (t) Carcinogenic in accordance with EC category Carc. Cat. 1 , Carc. Cat 2. Mutagenic in accordance with EC category Mut. Cat. 1 , Mut. Cat 2. Reprotoxic in accordance with EC category Repr. Cat. 1 , Repr. Cat 2.	carcinogenic, mutagenic or reprotoxic substances in the respective category 1 or 2.	Carcinogenic working materials – category 1 or 2 Germ cell mutagenics – category 1 or 2 Teratogenic working materials in the column “pregnancy” in group A or B	Content of VOC in bitumen emulsions must not exceed 1% wt of finished product.	
RAL-UZ 118: Energy-Efficient	Heat pumps with electricity driven compressors gas-				Manufacturer must declare compliance with:	

[54] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=125

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
Heat Pumps[55]	fired absorption and adsorption heat pump devises, gas-fired adsorption heat pumps, ready to use heat absorption pumps and ready to use heat pumps with internal combustion engine driven compressors				Cadmium, lead, mercury, chrome (VI) or flame-retardant materials i.e. polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE), as listed in Article 4 of Regulation 2011/65/EU of the European Parliament and of the Council, may not be used in the systems. The tolerance limits listed in An-nex II of Regulation 2011/65/EU are valid	
RAL-UZ 120: Elastic floor coverage[56]	Flexible floor coverings that are: Plastic, made of natural and synthetic, rubber, linoleum and cork	On REACH list or has Hazard or risk phrase listed in Table A1-14	Carcinogenic (K1, K2) Mutagenic (M1, M2) Reprotoxic (R_F1, R_F2) Teratogenic (R_E1, R_E2).	Carcinogenic working materials (category 1 or 2) Germ cell mutagenic working materials (category 1 or 2)	Plasticising substances derived from phthalates must not be used in the manufacture of floor coverings Only the following flame retardants may be used:	Carcinogenic N-nitrosamines, as classified under TRGS 552, if used in rubber-based floorings must meet strict emission limits to ensure it is not detectable (detection

[55] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=257
[56] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=222

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
					Inorganic ammonium phosphates Other dehydrating minerals Expandable graphite	limit: 3.6 µg/kg, determination limit: 11 µg/kg)
RAL-UZ 123: Low-emission sealants for interior use[57]	Sprayable and plastically processable sealants, as defined under DIN EN 26 927 (jointing products, sealants) - products which are filled into joints in their seal the latter by making complete contact to the joint flanks. Whilst sealants for surface application	Substances listed under Annex I to Directive and under Ordinance on Hazardous Substances with the following must not be in the product: Very Toxic (T+) Toxic (T) Carcinogenic (EC Category Carc. Cat 1 or 2) Mutagenic (EC Category	Carcinogenic (K1, K2) Mutagenic (M1, M2) Reprotoxic (R_F1, R_F2) Teratogenic (R_E1, R_E2)	Carcinogenic working materials (Category 1 or 2) Germ-cell mutagenic working materials (Category 1 or 2).	With the exception of the microbicide thiaibendazole (the content of which must be below 400 ppm), biocides must not be used in sealants Sealants shall not contain pigments that have lead, cadmium or chromium VI compounds as constituent elements. However, it is accepted that it in some cases, these impurities will be found within the sealant. This is permitted, provided they are in	Emission values have been set for VOC to ensure adequate indoor air quality

[57] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=144

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
	are within the scope, sealants designed for exterior applications are not. This will include products such as: Water-based, acetate-based silicone joint sealants, neutral curing silicones (except for oxime curing systems) and acrylate-based joint sealants	Mut.Cat 1 or 2) Reprotoxic (EC Category Repr. Cat 1 or 2)			the raw material and below 100ppm or in the case of lead, below 200ppm. Plasticisers from the class of phthalates must not be used in the manufacture of sealants Should organotin compounds be used as a catalyst in the curing reaction, only those organotin compounds listed in the Ordinance on Food and Other Commodities may be used (with the exception of dibutyl tin compounds). Furthermore, the impurities of tributyl and dibutyl tin compounds (TBT/DBT) must not exceed 0.1%. Those sealants that may be used in the kitchen and thus come into contact with food or used in pipes and come into	

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
					contact with drinking water must be accompanied by additional test certificates	
RAL-UZ 128: Textile floor covering[58]	Textile flooring products that meet the definition of DIN ISO 2424	Substances listed under Annex I to Directive and under Ordinance on Hazardous Substances with the following must not be in the product: Very Toxic (T+) Toxic (T) Carcinogenic (EC Category Carc. Cat 1 or 2) Mutagenic (EC Category Mut.Cat 1 or 2) Reprotoxic (EC Category	Carcinogenic (K1, K2) Mutagenic (M1, M2) Reprotoxic (RF1, RF2) Teratogenic (RE1, RE2)		Textile floor coverings may not use halogenated organic compounds in their manufacture. If necessary to comply with fire protections, inorganic ammonium phosphates, other dehydrating minerals or expandable graphite may be used as flame retardants. It should be noted that antimony oxides should not be used as flame retardants. Plasticising substances from the class of phthalates may not be used in the manufacture of	N-nitrosamines that are emitted from foam backings made of styrene butadiene rubber must be below a set threshold. Emissions of VOC must meet strict criteria values to ensure there are no hazards to health. The textile floor covering must satisfy the odour criteria developed by the

[58] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=155

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
		Repr. Cat 1 or 2)			floor coverings. The pigments and dyes used in textile floor coverings must not contain cadmium, lead or nickel. Further dyes and pigments not to be used in textile floor covering are listed in Table A2-11: Textile floor coverings must not use polymer dispersions, resins or binders that contain alkylphenol ethoxylates	GUT association
RAL-UZ 132: Low-Emission Thermal Insulation Material and Suspended Ceilings for Use in	Those thermal insulation materials that accord to DIN EN 13162 to 13171 and ceilings that are used in the following applications (according to DIN 4108-10) are within the scope of RALU-	Substances listed under Annex I to Directive and under Ordinance on Hazardous Substances with the following must not be in the product: Very Toxic (T+)	Carcinogenic (K1, K2) Mutagenic (M1, M2) Reprotoxic (R_F1, R_F2) Teratogenic (R_E1, R_E2)	Carcinogenic working materials (Category 1 or 2); Germ-cell mutagenic working materials (Category 1 or 2).	Not use halogenated organic compounds in their manufacture, including as a blowing agent , nor as a flame retardant Plasticising substances from the class of phthalates may also not be used in the manufacture of	VOC emissions must meet defined criteria

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
Buildings[59]	UZ 132 criteria. This includes: Interior insulation of the wall (WI), insulation of double-leaf walls (WZ), insulation of timber frame and timber panel constructions (WH), insulation of partition walls (WTR), interior insulation of the ceiling (on the underside) of the roof (DI), intermediate rafter insulation (DZ) Interior insulation of the ceiling or base	Toxic (T) Carcinogenic (EC Category Carc. Cat 1 or 2) Mutagenic (EC Category Mut.Cat 1 or 2) Reprotoxic (EC Category Repr. Cat 1 or 2)			these insulation materials Insulation material that has been manufactured from mineral wool must warn users about temporary short-term skin irritations that may occur Not contain biocides For coated insulation products that make up part of a suspended ceiling, the following requirements apply to preparations of dyes and pigments Lead, cadmium or chromium VI compounds or constituent parts must be used. However, process related or technically unavoidable impurities are	

[59] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=171

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	Scope	Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following				Emissions
		REACH / Directive DSD/ CLP	TRGS 905[47]	MAK Value	Additional criteria	
	plate (on the upper side) without sound-proofing requirements Interior insulation of the ceiling or base plate (on the upper side) with soundproofing requirements) (DES) according to DIN 4108-10 Any insulation material or suspended ceilings that are approved by the building inspection authorities.				permitted in its raw material up to a maximum of 100 ppm, or 200 ppm for lead Aklylphenol ethoxylates may not be used in products Those dyes and pigments that contain plasticisers can be added, provided they meet the definition under the VdL Directive 01 and the quantity added does not exceed in terms of content 1g/m^2 in finished products Biocides must not be used, with the exception of those micro-biocides used as in-can preservatives that have been listed under Table A2-12	
RAL-UZ 140 External Thermal	External Thermal Insulation Composite Systems (ETICS) are					

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
Insulation Composite Systems[60]	used to insulate building facades. They are typically materials/components that are inter-connected and applied to the outside of a wall with a view to improving the thermal insulation of a building. These are comprised of at least four layers: A means to fix the ETICS to the wall, whether that be an adhesive layer or a mechanical fixing etc.					

[60] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=229

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
	Thermal insulating layer Reinforcing layer that is often made with plaster or mesh Final layer that serves as the surface design as well as offering weather protection. Within the scope of this criteria are ETICS that accord with 'DIN 55699, application of external thermal insulation criteria'.					
RAL-UZ 156: Low-emission floorings	Applies to underlays made of the following material: Wood fibres, rubber	Toxic substances or carcinogenic, mutagenic and reprotoxic substances. (Table A1-14)	Carcinogenic (K1, K2), mutagenic (M1, M2), reprotoxic (R_F1, R_F2) and tetragenic (R_E1, R_E2)	Carcinogenic (category 1 and 2), germ-cell mutagenic (category 1 and 2)	Plasticising substances from the class of phthalates Carcinogenic N-nitrosamines	Emission limits for • TVOC; and • Formaldehyde.

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	**Scope**	**Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following**				**Emissions**
		REACH / Directive DSD/ CLP	**TRGS 905[47]**	**MAK Value**	**Additional criteria**	
underlays[61]	granules, cork granules, paperboard, polyethylene, polystyrene foam and polyurethane				according to TRGS 552 Halogenated organic compounds or partially halogenated hydrochlorofluorocarbons may be used as blowing agents Azo dyes or pigments that may release amines listed in Directives 2002/61/EEC or TRGS 614 or colourants which contain mercury, lead, cadmium or chromium VI compounds.	
RAL-UZ 176: Low emission floor coverings, panels and doors for interiors made of	Ready to use interior floor coverings as well as panels and interior door elements. Floor coverings includes: Parquet, laminate and linoleum.	Carcinogenic in cat 1 or 2 Mutagenic in cat 1 or 2 Reprotoxic in cat 1 or 2 Being of very high concern (included in the list set up in accordance with REACH.			Formaldehyde limits referring to RAL-UZ 76: Wood based materials or if not awarded 0.1 ppm. The use of biocide is not permitted.	Emission limits for: • TVOC; • TSVOC; carcinogenic substances; • VOC; • formaldehyde; and • ammonia.

[61] For more information consult criteria on Blue Angel website, which can be accessed at http://www.blauer-engel.de/_downloads/vergabegrundlagen_en/e-UZ-156.zip

Table A2-10: Construction product requirements under Blue Angel						
Award Criteria and Product Group	Scope	Content Requirements – Products must not contain substances, preparations or constituent parts that have these classifications under the following				Emissions
		REACH / Directive DSD/ CLP	TRGS 905[47]	MAK Value	Additional criteria	
wood and wood based materials.						

Table A2-11: Hazard and risk phrases applicable to the award of the Blue Angel label (RAL-UZ 120 and RAL-UZ 156)[62]		
Regulation (EC) 1272/2008 (GHS Regulation)	**Directive 67/548/EEC (Dangerous Substance Directive)**	**Description**
Toxic Substance		
H300	R28	Fatal if swallowed
H301	R25	Toxic if swallowed
H304	R65	May be fatal if swallowed and enters airways
H310	R27	Fatal in contact with skin
H311	R24	Toxic in contact with skin
H330	R26	Fatal if inhaled
H331	R23	Toxic if inhaled
H370	R39/23/24/25/26/27/28	Causes damage to organs
H372	R48/25/24/23	Causes damage to organs
Carcinogenic, Mutagenic and Reprotoxic Substances		
H340	R46	May cause genetic defects
H350	R45	May cause cancer
H350i	R49	May cause cancer by inhalation
H360F	R60	May damage fertility
H360D	R61	May damage the unborn child
H360FD	R60/61	May damage fertility. May damage the unborn child
H360Fd	R60/63	May damage fertility. Suspected of damaging the unborn child
H360Df	R61/62	May damage the unborn child Suspected of damaging fertility
H362	R64	May cause harm to breast-fed children

[62] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=222

Table A2-12: Pigments and dyes banned from Blue Angel textile floor covering product group[63]		
Azo dyes (potentially cleave one the aromatic amines listed below)*	**Dyes that are carcinogenic, teratogenic or reprotoxic****	**Potentially sensitising dyes**
4-aminobiphenyl (92-67-1)	C.I. Basic Red 9: C.I. 42 500	C.I. Disperse Blue 3 C.I. 61 505
Benzidine (92-87-5)	C.I. Disperse Blue 1: C.I. 64 500	C.I. Disperse Blue 7 C.I. 62 500
4-chloro-o-toluidine (95-69-2)	C.I. Acid Red 26: C.I. 16 150	C.I. Disperse Blue 26 C.I. 63 305
2-naphthylamine (91-59-8)	C.I. Basic Violet 14: C.I. 42 510	C.I. Disperse Blue 35
o-aminoazotoluene (97-56-3)	C.I. Disperse Orange 11: C.I. 60 700	C.I. Disperse Blue 102
2-amino-4-nitrotoluene (99-55-8)	C.I. Direct Black 38: C.I. 30 235	C.I. Disperse Blue 106
p-chloroaniline (106-47-8)	C.I. Direct Blue 6: C.I. 22 610	C.I. Disperse Blue 124
2,4-diaminoanisole (615-05-4)	C.I. Direct Red 28: C.I. 22 120	C.I. Disperse Brown 1
4,4'-diaminodiphenylmethane (101-77-9)	C.I. Disperse Yellow 3: C.I. 11 855	C.I. Disperse Orange 1 C.I. 11 080
3,3'-dichlorobenzidine (91-94-1)		C.I. Disperse Orange 3 C.I. 11 005
3,3'-dimethoxybenzidine (119-90-4)		C.I. Disperse Orange 37
3,3'-dimethylbenzidine (119-93-7)		C.I. Disperse Orange 76 (formerly „Orange 37“)
3,3'-dimethyl-4,4' diaminodiphenylmethane (838-88-0)		C.I. Disperse Red 1 C.I. 11 110
p-cresidine (120-71-8)		C.I. Disperse Red 11 C.I. 62 015
4,4'-methylene-bis-(2-chloroaniline) (101-14-4)		C.I. Disperse Red 17 C.I. 11 210
4,4'-oxydianiline (101-80-4)		C.I. Disperse Yellow 1 C.I. 10 345
4,4'-thiodianiline (139-65-1)		C.I. Disperse Yellow 3 C.I. 11 855
o-toluidine (95-53-4)		C.I. Disperse Yellow 9 C.I. 10 375
2,4-diaminotoluene (95-80-7)		C.I. Disperse Yellow 39

[63] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=155

2,4,5-trimethylaniline (137-17-7)		C.I. Disperse Yellow 49
4-aminoazobenzene (60-09-3)		
o-anisidine (90-04-0)		
** according to Directive 2002/61/EC* *** according to Commission Decision 2002/371/EC (EU eco-label for textile products) and Őko-Tex Standard 100*		

Table A2-13: Substances that must not be used in binders and coatings for textile floor covering product group[64]	
Active substances/active substance combination	**Content**
Titanium dioxide/silver chloride	≤ 100 ppm in relation to silver chloride
2- methyl - 2H- isothiazol- 3- one / 1,2- benzisothiazol- 3(2H)- one in a ratio of 1:1	≤ 200 ppm
5- chloro - 2- methyl - 4- isothiazolin - 3- one / 2-methyl - 4- isothiazolin - 3- one in a ratio of 3:1	≤ 15 ppm
3- iodo - 2- propynyl butylcarbamate	≤ 80 ppm
1,2- benzisothiazol- 3(2H)- one	≤ 200 ppm
2- bromo - 2- nitropropane -1,3- diol (BNPD)	≤ 200 ppm
BNPD & CIT/MIT (3:1)	≤ 130 ppm + ≤ 15 ppm
BNPD & CIT/MIT (3:1)	≤ 150 ppm + ≤ 10 ppm
BNPD & CIT/MIT (3:1)	≤ 170 ppm + ≤ 5 ppm
MIT/BIT (1:1) & CIT/MIT (3:1)	≤ 150 ppm + ≤ 12,5 ppm
MIT/BIT (1:1) & CIT/MIT (3:1)	≤ 125 ppm + ≤ 15 ppm
1,2- dibromo - 2,4- dicyanobutane (DBDCB)	≤ 500 ppm
BIT & CIT/MIT (3:1)	≤ 150 ppm + ≤ 12.5 ppm
BNPD & MIT/BIT (1:1)	≤ 120 ppm + ≤ 75 ppm
Zinc pyrithione (ZNP) & BIT	≤ 100 ppm + ≤ 100 ppm
Zinc pyrithione (ZNP) & MIT/BIT (1:2 to 1:1)	≤ 50 ppm + ≤ 150 ppm
BNPD & BIT	≤ 100 ppm + ≤ 100 ppm
Sodium pyrithione (NaP) & BIT	≤ 50 ppm + ≤ 150 ppm

[64] For more information consult criteria on Blue Angel website, which can be accessed at: http://www.blauer-engel.de/en/products_brands/vergabegrundlage.php?id=155

Testing/assessment

If there is an existing award criteria, suppliers file applications to RAL – the label awarding agency. This board will review the application, allow the relevant Bundesland to comment and then conclude whether the product can bear the Blue Angel.

For new award criteria, the proposal is submitted to the Federal Environment Agency and RAL, with expert hearings and an Environmental Label Jury making recommendations where appropriate.

Product group criteria are only valid for a set period of time and are then reviewed.

Communicating conformity

The Blue Angel is affixed to the product.

Objectivity/impartiality

The scheme is owned by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. Applications are reviewed and the label is awarded by the independent body RAL.

Extent of use of the scheme

The Blue Angel label may be awarded for a wide range of products, however only 16% of them are construction products (see Table A2-14) with many more products focused on the office sector (e.g. printers, copiers, multifunction devices). This figure was derived from the number of licenses listed under the Blue Angel product groups, whereby a license gives a company the right to use the label for a specific product group.

Table A2-14: Product licences under Blue Angel[65]

Mandate	Title	Number of product licenses	Products in scheme
M103	Thermal insulating products	60	Low-Emission Thermal Insulation Material and Suspended Ceilings for Use in Buildings (60)
M113	Wood based panels	209	Low-Emission Wood Products and Wood-Base Products (192), Low-emission Composite Wood Panels (17)
M118	Waste water disposal	19	Water-saving Flushing Boxes (19)

[65] Blue Angel website: Survey of all Basic Award Criteria, http://www.blauer-engel.de/en/products_brands/survey_basic_award_criteria.php

Table A2-14: Product licences under Blue Angel[65]			
Mandate	**Title**	**Number of product licenses**	**Products in scheme**
M119	Floorings	383	Low emission floor-covering adhesives and other covering materials (242), Elastic Floor Coverings (13), Textile Floorcoverings (125), Flooring Underlays (3)
M121	Wall and ceiling finishes	162	Wallpapers and Woodchip Wall Coverings primarily made of Recycled Paper (162)
M129	Space heating appliances	89	Wood pellet stoves (17), Wood pellet boilers and wood chips boilers (72)
M/474	Sealants for non-structural use in joints in buildings and pedestrian walkways	23	Low-Emission Sealants for Interior Use (23)
M/489	External Thermal Insulation Composite Systems	2	External Thermal Insulation Composite Systems (ETICS) (2)
N/A	Other construction products	5	Low solvent roof coatings and bitumen adhesives (5)
N/A	Non-construction products	4,893	Office Equipment with Printing Function (Printers, Copiers, Multifunction Devices) (1,414), Low-Emission Wall paints (844), Recycled Paper (647), Low-pollutant Varnishes (402), Recycled Cardboard (323), Sanitary Paper Products made of Recycled Paper (284), Printing and Publication Papers (115), Products made from Recycled Plastics (Edition March 2010) (114)[66]

BRE Global's Green Guide

Introduction

This Green Guide to specification provides a Life Cycle Assessment of the environmental impacts of major building elements using BRE's Environmental Profiles Methodology[67]. The Green Guide contains generic impact assessments for over 2000 commonly used construction elements. BRE Global also offers a certification scheme, Environmental

[66] For conciseness, only products with more than 100 licenses have been included.
[67] BRE Global website: Environmental profiles, http://www.bre.co.uk/page.jsp?id=53

Profiles, for proprietary product assessments[68]. The Environmental Profiles scheme is a type III environmental labelling scheme for construction products, conforming to the relevant ISO standards[69] [70] and allows proprietary products to be benchmarked against industry averages.

Objectives of the scheme

The scheme aims to provide a guide to the environmental impact of building products and materials which is easy to use and based on a sound methodology and data[71]. The database is mostly intended to be used by trade associations, designers, developers, architects, contractors, facility managers and their clients.

Geographical coverage

The Green Guide Online certification and database are mostly used in the UK.

Focus of the scheme (content vs. emissions)

Manufacturers are required to provide detailed information on material inputs. This includes a specification of materials and substances that can adversely affect human health and the environment, in all life cycle stages[72]. The assessment does not consider in-use emissions but does include impact assessments for toxicity effects (human, aquatic and ecotoxicity) related to upstream emissions in manufacturing and those associated with end-of-life (disposal, recycling, energy recovery)[73].

Products covered

From the information on the Green Guide Online website it can be seen that the majority of the products which the BRE Global scheme covers are construction products:

- upper floor construction;
- ground floor construction;

[68] Pers. Comm. 2013

[69] BRE (2007): Methodology for Environmental Profiles of Construction Products – Product Category Rules for Type III environmental product declaration of construction products (DRAFT), accessed at http://www.bre.co.uk/filelibrary/greenguide/PDF/Environmental_Profiles_Methodology_2007_-_Draft.pdf

[70] BRE (2007): Methodology for Environmental Profiles of Construction Products – Product Category Rules for Type III environmental product declaration of construction products (DRAFT), accessed at http://www.bre.co.uk/filelibrary/greenguide/PDF/Environmental_Profiles_Methodology_2007_-_Draft.pdf

[71] BRE Global website: Background to the Green Guide to Specification, accessed at http://www.bre.co.uk/greenguide/page.jsp?id=2069

[72] BRE (2007): Methodology for Environmental Profiles of Construction Products – Product Category Rules for Type III environmental product declaration of construction products (DRAFT), accessed at http://www.bre.co.uk/filelibrary/greenguide/PDF/Environmental_Profiles_Methodology_2007_-_Draft.pdf

[73] Perss Comm. 2013

- internal walls;
- windows;
- external wall construction;
- insulation;
- separating wall;
- separating floor;
- roof construction;
- landscaping; and
- floor finishes.

Substances covered (including award criteria)

There are no specific criteria relating to substances, rather it is the effect products have on the environment and human health during their life cycle which are considered and assessed, Table A2-15. Whilst most categories focus on the environment, under the 'Human toxicity' category, the threat of exposure and effects for each toxic substance are expressed as kg 1, 4 dichlorobenzene equivalent.

Table A2-15: BRE Global's environmental impact categories

Environmental impact categories	Reference characterisation units
Climate change	kg CO_2 eq (100yr)
Stratospheric ozone depletion	kg CFC-11 eq
Eutrophication	kg phosphate (PO_4) eq
Acidification	kg sulphur dioxide (SO2) eq
Photochemical ozone creation	kg ethane (C_2H_4) eq
Human toxicity	kg dichlorobenzene (1,4-DB) eq
Ecotoxicity to water	kg dichlorobenzene (1,4-DB) eq
Ecotoxicity to land	kg dichlorobenzene (1,4-DB) eq
Fossil fuel depletion	tonnes of oil equivalent (toe)
Waste disposal	tonnes solid waste
Water extraction	m^3 water extracted
Mineral resource depletion	tonnes of minerals extracted
Nuclear waste	mm^3 high level waste

Testing/assessment

In order to certify a product, the manufacturer must supply information about the factory and the manufacturing process. This information is reviewed by BRE Global and verified

with a site audit. The assessment is made against environmental impacts, above, and a BRE Global 'Ecopoints' score, which compares the impacts against a typical person[74, 75].

Products modelled in the context of a building element (i.e. in an assembly with other products) receive a rating from A+ to E for each environmental impact category, where A+ represents the best environmental performance and least environmental impacts under the 13 impact categories[76]. The outcomes for each impact are normalised and weighted so that the ratings provide an impartial value on the relative importance of each impact[77].

Construction products assessed via the Environmental Profiles scheme are benchmarked in the building context by substituting proprietary data for the generic data within Green Guide element specifications[78]. For example, the LCA results for proprietary plasterboard might be substituted for the generic data in a range of internal wall specifications in order to benchmark its specific performance relative to the industry average.

Communicating conformity

On completion of the profiling, a client obtains a Certificate, a Certified Environmental Profile, a Green Guide rating (if the product type is covered in the Guide) and a report of the assessment findings[79].

Objectivity/impartiality

The Environmental Profiles scheme is run in accordance with the requirements of BS EN 45011[80]. The scheme is run under third party accreditation of UK Accreditation Services (UKAS).

Extent of use of the scheme

[74] 100 Ecopoints represents the impact of one European person (Western Europe - EU15 plus Norway and Switzerland) in one year.

[75] BRE Global (2012): Environmental Profiles of Construction Products – Scheme Document, accessed at http://www.bre.co.uk/filelibrary/greenguide/PDF/EP.CP.1.3_SD028-5_Environmental_Profiles_of_construction_products_Feb_2012.pdf

[76] BRE: 'Is it Really Green?' brochure, accessed at http://www.bre.co.uk/filelibrary/greenguide/PDF/BRE_Materials_Brochure.pdf

[77] BRE (2007): Methodology for Environmental Profiles of Construction Products – Product Category Rules for Type III environmental product declaration of construction products (DRAFT), accessed at http://www.bre.co.uk/filelibrary/greenguide/PDF/Environmental_Profiles_Methodology_2007_-_Draft.pdf

[78] Pers. Comm. 2013

[79] Green Book Live website: Environmental Profile, accessed at http://www.greenbooklive.com/search/scheme.jsp?id=9

[80] Pers. Comm. 2013

BRE Global certified Environmental Profiles are available on the 'GreenBookLive' website, along with products certified by other certification bodies within the scheme. Products and environmental profiles are reviewed each year to ensure they are up to date and are reassessed every three years.

Construction elements listed on the Green Guide are categorised by building type, category, sub-category and element type. The elements are composite and cannot be allocated to a specific mandate, for example, 'Chipboard decking on galvanised steel joists' which BRE categorise as upper floor construction for domestic and retail buildings, could be classed as M113 – Wood based products and M115 – Reinforcing steel. Therefore products have not been classified into the mandates but instead remain in the categories used by BRE (Table A2-16). The scheme currently covers approximately 700 proprietary products from over 50 manufacturing organisations[81].

Table: A2-16: Products certified under BRE Global[82]

Category	Building Type						Total No. products
	Domestic	Health	Industrial	Commercial	Retail	Education	
Upper floor construction	56	23	0	26	28	23	64
Ground floor construction	142	0	0	0	0	0	142
Internal wall	64	66	64	66	64	9	75
Windows	19	22	22	22	22	22	39
External wall construction	484	484	491	484	484	484	491
Insulation	36	36	36	36	36	36	36
Separating wall	60	0	0	0	0	0	60
Separating floor	197	0	0	0	0	0	197
Roof construction	264	202	164	166	202	154	264
Landscaping	91	91	91	91	91	91	91
Floor finishes	53	16	0	33	58	18	135
Total	***1,466***	***940***	***868***	***924***	***985***	***837***	***1,594***

[81] Pers. Comm. 2013

[82] BRE Global website: Green Guide 2008 ratings, http://www.bre.co.uk/greenguide/ggselectelement.jsp?buildingType=Housing

Byggvarubedömningen (BVB, Sweden)

Introduction

Byggvarubedomningen (BVB), meaning Building Material Assessment, is a voluntary system developed by major property owners and developers in Sweden with the aim that only products which have been evaluated and approved are used in future buildings[83].

Objectives of the scheme

The Swedish parliament has an objective to achieve 'a non-toxic environment', which seeks to almost eliminate non-natural and hazardous substances in newly manufactured finished products[84]. Therefore there is a strong demand for construction products which do not contain hazardous substances and most Swedish building contractors demand products assessed by BVB, BASTA or both[85].

Geographical coverage

This scheme was developed and is primarily used in Sweden.

Focus of the scheme (content vs. emissions)

There are seven assessment categories; the 'Chemical content' category sets limits for substances and also prescribes substances which are not permitted for the higher classification. If products are intended for indoor use they must also meet the criteria in the 'Indoor environment' category, which sets emission limits for VOC, TVOC and formaldehyde.

Products covered

The database is not free to access, therefore it has not been possible to ascertain the types of product covered. New products are either added voluntarily by manufacturers requesting for their products to be evaluated or when members identify a need[86].

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[83] BVB: Information brochure, accessed at http://www.byggvarubedomningen.se/documents/public/A4_broschyr_BVB_Final_2.pdf

[84] Swedish Chemicals Agency (KEMI): Phase-out of substances of very high concern – interim target 3, http://www.kemi.se/en/Content/A-Non-toxic-environment/The-objective-and-interim-targets/Interim-target-3-/

[85] Ruukki website: News and events, http://translate.google.co.uk/translate?hl=en&sl=sv&u=http://www.ruukki.se/Nyheter-och-event/Nyhetsarkiv/2012/Ruukkis-produkter-val-godkanda-av-Byggvarubedomningen&prev=/search%3Fq%3Dbvb%2BByggvarubed%25C3%25B6mningen%26start%3D10%26client%3Dfirefox-a%26sa%3DN%26rls%3Dorg.mozilla:en-US:official%26biw%3D946%26bih%3D921

[86] BVB: Information brochure, accessed at http://www.byggvarubedomningen.se/documents/public/A4_broschyr_BVB_Final_2.pdf

Substances covered (including award criteria)

The scheme has developed a set of environmental and health related criteria which assess the product content and the production processes; these are split into the following areas:

- chemical content (declaration of content);
- input materials (raw materials);
- construction phase;
- management phase;
- demolition;
- residual waste products; and
- indoor environment[87].

For the purpose of this study only the criteria relating to chemical content and indoor emissions will be reviewed.

The BVB 'Chemical content' criteria are comprehensive and based on EU REACH legislation, see Table A2-21. In addition to these criteria, there are substances which are not permitted in products awarded the 'Recommended' classification, these are:

- arsenic and its compounds;
- brominated flame retardants;
- PFOA (perfluoroctaneacids);
- PFOS (perfluorooctane sulfonate); and
- organotin compounds[88]

In 2009 BVB and BASTA began working together towards a common set of criteria, whereby those products which meet BASTA content requirements will automatically achieve the BVB 'Accepted' classification for chemical content[89].

[87] Ecolabel Index website: Byggvarubedömningen, http://www.ecolabelindex.com/ecolabel/byggvarubedomningen

[88] BVB (2010) Building Material Assessment – Assessment Criteria, accessed at http://www.byggvarubedomningen.se/documents/public/bedomningskriterier/Byggvarubedomningen_criteria_101109_english_red_3_2011.pdf

[89] BVB website: Press Release June 12 2009, http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DBVB%2BByggvarubed%25C3%25B6mningen%26client%3Dfirefox-a%26hs%3DYL6%26rls%3Dorg.mozilla:en-US:official%26biw%3D946%26bih%3D921&rurl=translate.google.co.uk&sl=sv&u=http://www.byggvarubedomningen.se/documents/public/090612pressmeddelandeBASTABVB.pdf&usg=ALkJrhiZO_A8uwqbCfCpOp_DXYUrHYSSTA

Table A2-17: BVB chemical content criteria[90]			
Substance property	**Recommended classification**	**Accepted classification**	**Avoided classification**
Product registered in BASTA	-	Classification met	-
R45, R49	<0.01% of individual substance	0.01% < conc. <0.1% of individual substance	> 0.1% of individual substance
R40	<0.1% of individual substance	0.1% <conc. <1% of individual substance	> 1% of individual substance
R46	<0.01% of individual substance	0.01% <conc. <0.1% of individual substance	> 0.1% of individual substance
R68	<0.1% of individual substance	0.1% <conc. <1% of individual substance	> 1% of individual substance
R60, R61	<0.01% of individual substance	0.01% <conc. <0.5% of individual substance	> 0.5% of individual substance
R62, R63	<0.1% of individual substance	0.1% <conc. <5% of individual substance	> 5% of individual substance
R64	<0.01% of individual substance	0.01 <conc. <0.1% of individual substance	> 0.1% of individual substance
R42, R43	<0.01% of individual substance	0.01% <conc. <1% of individual substance	> 1% of individual substance
R26, R27, R28	<0.01%	0.01% <conc. <1%	> 1%
R39 combined with R26, R27 and /or R28	<0.01% of individual substance	0.01% <conc. <1% of individual substance	> 1% of individual substance
R23, R24, R25	<0.01%	0.01% <conc. <25%	> 25%
R39 combined with R23, R24 and /or R25	<0.01% of individual substance	0.01% <conc. <10% of individual substance	> 10% of individual substance
(R48 combined with R23, R24 and /or R25	<0.01% of individual substance	0.01% <conc. <10% of individual substance	> 10% of individual substance
Volatile organic chemical substances; R48 combined with R20, R23, R65 or R67	<1%	1% <conc. <10%	> 10%
Very persistent and very bio-accumulative organic substances	<0.001%	0.001% <conc. <0.1%	> 0.1%

[90] BVB (2010): Assessment Criteria, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DBVB%2BByggvarubed%25C3%25B6mningen%26client%3Dfirefox-a%26hs%3DYL6%26rls%3Dorg.mozilla:en-US:official%26biw%3D946%26bih%3D921&rurl=translate.google.co.uk&sl=sv&u=http://www.byggvarubedomningen.se/documents/public/bedomningskriterier/Byggvarubedomningens_bedomningskriterier_fran_20110101_Red_5_2011.pdf&usg=ALkJrhhKSt-3-jZqPv4I81MYcnoSfQ-z3w

Table A2-17: BVB chemical content criteria[90]			
Substance property	**Recommended classification**	**Accepted classification**	**Avoided classification**
Persistent, bio-accumulative and toxic organic substances	<0.001%	0.001% <conc. <0.1%	> 0.1%
Pure substance or compound of cadmium in homogeneous material	*Chemical products:* Pure cadmium or its compounds will not occur regardless of grades. *Other products:* <0.001%	0.001% <conc. <0.01%	> 0.01%
Pure substance or compounds of lead in homogeneous material	*Chemical products:* Pure lead and its compounds will not occur regardless of grades. *Other products:* <0.001%	0.001% <conc. <0.1%	> 0.1%
Pure substance or compound of mercury in homogeneous material	Total ban Mercury (and its compounds) have not been used in, or added to, the product. Possible contamination <0.25 mg/kg	Total ban Mercury (and its compounds) have not used in, or added to, the product. Possible contamination <0.25 <conc. <2.5 mg/kg	Occurs Mercury (and its compounds) have used in, or added to, the product. Possible contamination >2.5 mg/kg
R59	<0.01% of individual substance	0.01% <conc. <0.1% of individual substance	> 0.1% of individual substance
R50	<0.1 x "Concentration limit under Classification list*".	X 0.1 "Concentration limit under Classification List * "<conc. < "Concentration limit under Classification list*"	> "Concentration limit under Classification list*".
R51/53	<0.1%	0.1% <conc. <25%	> 25%
R50/53	<0.1 x "Concentration limit under Classification list * ".	X 0.1 "Concentration limit under Classification List * "<conc. < "Concentration limit under Classification list *.	> "Concentration limit under Classification list*".
R53	<1%	1% <conc. <25%	> 25%
Potential PBT/vPvB	<0.01%	-	-

Table A2-17: BVB chemical content criteria[90]			
Substance property	**Recommended classification**	**Accepted classification**	**Avoided classification**
Disruptors	<0.01% of individual substance	0.01% <conc. <0.1% of individual substance	> 0.1% of individual substance

Those products which are intended to be used indoors also need to be assessed against the 'Indoor environment' criteria, see Table A2-18.

Table A2-18: BVB emissions (indoor environment) criteria[91]			
Substance property	**Recommended classification**	**Accepted classification**	**Avoided classification**
Documentation on emissions	Details are on issue speed for the five highest peaks VOC or Being made of stone, brick, tiles, terrazzo tiles, glass or metal	Details are on the VOC	The data on VOC
Formaldehyde	The emission rate of formaldehyde <0.05 mg/m 2 hrs **or** Formaldehyde Content <0.05 mg/m	The emission rate of formaldehyde 0.05 to 0.124 mg/m 2 hrs **or** Formaldehyde content of 0.05 to 0.124 mg/m	The emission rate of formaldehyde > 0,124 mg/m 2 hrs **or** Formaldehyde Content> 0.124 mg/m
Assessment of issues	Emission rate for TVOC <200 g/m 2 , H **or** TVOC levels <200 mg/m	Emission rate for TVOC 200-400 g/m 2 , H **or** TVOC content of 200-400 g/m	Emission rate for TVOC> 400 g/m 2, H **or** TVOC levels> 400 mg/m
Electric Fields	N/A	N/A	N/A
Magnetic fields	N/A	N/A	N/A
Noise	N/A	N/A	N/A

Substance properties from the seven assessment categories listed above are classified as 'Recommended', 'Accepted' and 'Avoided'[92] and the final assessment is determined according to Table A2-19.

[91] BVB (2010): Assessment Criteria, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DBVB%2BByggvarubed%25C3%25B6mningen%26client%3Dfirefox-a%26hs%3DYL6%26rls%3Dorg.mozilla:en-US:official%26biw%3D946%26bih%3D921&rurl=translate.google.co.uk&sl=sv&u=http://www.byggvarubedomningen.se/documents/public/bedomningskriterier/Byggvarubedomningens_bedomningskriterier_fran_20110101_Red_5_2011.pdf&usg=ALkJrhhKSt-3-jZqPv4I81MYcnoSfQ-z3w

Table A2-19: Weighting of criteria[93]		
Recommended	**Accepted**	**Avoided**
All content criteria are assessed as recommended	No content criteria are assessed as avoided	One of more of the content criteria are assessed as avoided
No life cycle criteria are assessed as avoided	No more than one life cycle criterion is assessed as avoided	Two or more of the life cycle criteria are assess as avoided
At least 50% of the goods relevant criteria are assess as recommended		

The final outcome is displayed as a symbol (Figure A2-1) in the database which aims to provide clear guidance to users.

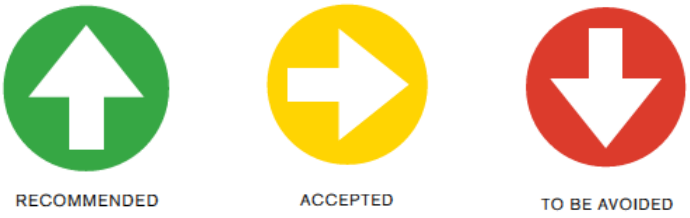

Figure A2-1: BVB final outcome classifications[94]

In May 2013 BVB and BASTA announced that they may choose to waive the content level assessment for stainless steel alloys[95]. The decision follows a literature review by the Finnish Institute of Occupational Health into the environmental and health properties of stainless steel which revealed that the release of nickel from stainless steel alloys was much

[92] Byggarubedomningen website: How the assessments, http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DBVB%2BByggvarubed%25C3%25B6mningen%26client%3Dfirefox-a%26hs%3DYL6%26rls%3Dorg.mozilla:en-US:official%26biw%3D946%26bih%3D921&rurl=translate.google.co.uk&sl=sv&u=http://www.byggvarubedomningen.se/sa/node.asp%3Fnode%3D484&usg=ALkJrhhrIJ3inUIXrhb_m1jlxO89lRb0Pw

[93] BASTA website: Evaluation results, http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DBVB%2BByggvarubed%25C3%25B6mningen%26client%3Dfirefox-a%26hs%3DYL6%26rls%3Dorg.mozilla:en-US:official%26biw%3D946%26bih%3D921&rurl=translate.google.co.uk&sl=sv&u=http://www.byggvarubedomningen.se/documents/public/bedomningskriterier/Byggvarubedomningens_viktning_av_kriterier.pdf&usg=ALkJrhgmRQVKLzABdIGRl0I_jgn9KQv-Mg

[94] BVB: Information brochure, accessed at http://www.byggvarubedomningen.se/documents/public/A4_broschyr_BVB_Final_2.pdf

[95] BVB website: Important information – Stainless steel, http://translate.google.co.uk/translate?hl=en&sl=sv&u=http://www.byggvarubedomningen.se/&prev=/search%3Fq%3Dbvb%2BByggvarubed%25C3%25B6mningen%26client%3Dfirefox-a%26sa%3DN%26rls%3Dorg.mozilla:en-US:official%26biw%3D946%26bih%3D894

lower than the corresponding metal and in fact toxicology is dependent on the properties of the alloy rather than the constituent metals[96].

Testing/assessment

The assessment is based on building products declarations, MSDS, certificates of subject content and other relevant information.

Assessment of construction products requires a building product declaration (Recycling Council template BPD3) which is no more than five years old and for chemicals a Swedish safety data sheet which is no more than 3 years old[97]. In order to achieve the 'Recommended' classification the producer must also complete a form stating the product is free from undesirable substances.

Communicating conformity

All certified products are published in the database that allows users to identify and select construction materials that have a reduced impact on the environment. Manufacturers are also permitted to display the logo on products.

Objectivity/impartiality

If applicants fail to provide adequate information, BVB take the worst case viewpoint and do not certify products. Applicants are encouraged to provide all relevant information and are allowed to submit further details if necessary. Assessment is based on Safety Data sheets and Building Product Declarations to ensure impartiality.

Extent of use of the scheme

The BVB product database is not free to access but the website claims to contain more than 7,000 construction products.

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[96] Jernkontoret website, http://translate.google.co.uk/translate?hl=en&sl=sv&u=http://www.jernkontoret.se/stalindustrin/staltillverkning/anvandning/godkanda_rostfria_stal/Rostfria_stal_i_BASTA_och_Byggvarubedomingen.pdf&prev=/search%3Fq%3Dbvb%2BByggvarubed%25C3%25B6mningen%26start%3D20%26client%3Dfirefox-a%26sa%3DN%26rls%3Dorg.mozilla:en-US:official%26biw%3D946%26bih%3D894

[97] BVB website: How the assessments, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3Dbyggvarubedomningen%26client%3Dfirefox-a%26rls%3Dorg.mozilla:en-US:official%26channel%3Dnp%26biw%3D946%26bih%3D920&rurl=translate.google.co.uk&sl=sv&u=http://www.byggvarubedomningen.se/sa/node.asp%3Fnode%3D484&usg=ALkJrhjSaoLRdPJ0XzvVklnpGxj_ir0pOg

Cradle to Cradle (Denmark/International)

Introduction

Cradle to Cradle was originally developed in the USA and now has an independent division in Denmark known as Vugge til Vugge. This voluntary scheme is multi-faceted with 5 categories relating to human and environmental health:

- material health: using materials that pose no danger to humans and the environment;
- material re-utilisation: designing products so all materials can be re-used by nature or industry;
- renewable energy and carbon management: assembling and manufacturing products with energy from renewable sources;
- water stewardship: making products in ways that protect and enhance water supplies; and
- social fairness: treating all the people involved in the product manufacturing process in socially responsible ways[98].

Objectives of the scheme

The scheme seeks to encourage innovation and continual improvement of products, so that their impacts on the environment and human health are minimal.

Geographical coverage

Although developed in the USA, it is now found in Denmark, France, Germany, the Netherlands, Spain and Switzerland.

Focus of the scheme (content vs. emissions)

Under the material health category the content of products is assessed and prescribes a list of banned substances. The likelihood of exposure for different scenarios is considered in unison with the base material matrix.

Products covered

Many of the products which this scheme certifies are classified as construction products, as well as interior design, personal and home care, paper and packaging and textile and fabric.

[98] Cradle to Cradle Certified website: Product certification, www.c2ccertified.org/product_certification/c2ccertified_product_standard

Substances covered (including award criteria)

There are 5 levels of certification for products, with each increment representing more stringent requirements, Table A2-20. Applicants are encouraged to work their way through the levels as their product is developed and tweaked over time.

Table A2-20: Material health requirements under each certification level[99]	
Certification level	**Requirements**
Basic	The product is 100% characterised by its generic materials (e.g., aluminium, polyethylene, steel, etc.) and/or product categories and names (e.g. coatings).
	The product does not contain any Banned List chemicals based on supplier declarations.
	The appropriate metabolism (i.e. technical nutrient (TN) or biological nutrient (BN)) is identified for the product and its components.
Bronze	The product is at least 75% assessed (by weight) using ABC-X ratings. Externally Managed Components (EMCs) are considered assessed and contribute to the overall percentage of the product that has been assessed. Products that are entirely BN in nature (e.g. cosmetics, personal care, soaps, detergents, etc.) are 100% assessed.
	A phase out or optimisation strategy has been developed for those materials with an X rating.
Silver	The product has been at least 95% assessed (by weight) using ABC-X ratings. Externally Managed Components (EMCs) are considered and contribute to the overall percentage of the product that has been assessed. Products that are entirely BN in nature (e.g. cosmetics, personal care, soaps, detergents, etc.) must be at least 100% assessed.
	The product contains no substances known or suspected to cause cancer, birth defects, genetic damage, or reproductive harm (CMRs) after the A, B, C, X assessment has been carried out.
Gold	The product has been 100% assessed (by weight) using A, B, C ratings. All EMCs have been assessed as non-X.
	Product meets C2C emissions standards.
	The product contains no X assessed materials (optimisation strategy is not required).
Platinum	All process chemicals have been assessed and none have been assessed as X.

This scheme provides a comprehensive list of specific chemical substances which are not permitted in certified products above a specified threshold, Table A2-21.[100]

[99] Cradle to Cradle website: Product certification – Material health, accessed at http://c2ccertified.org/product_certification/criteria/material_health/v3_0

100 Cradle to Cradle website: Remaking he way we make things, accessed at http://www.c2ccertified.org/images/uploads/C2CCertified_Product_Standard_%20V3_121112.pdf

Table A2-21: Substances banned from use in Cradle to Cradle certified products as intentional inputs of above 1,000ppm[101]			
Banned technical nutrient[102]	**CAS #**	**Banned biological nutrient[103]**	**CAS #**
Metals			
Arsenic	7440-38-2	Arsenic	7440-38-2
Cadmium	7440-43-9	Chromium VI	18540-29-9
Chromium VI	18540-29-9	Mercury	7439-97-6
Mercury	7439-97-6	Cadmium	7440-43-9
		Lead	7439-92-1
Flame Retardants			
Hexabromocyclododecane	3194-55-6;	Hexabromocyclododecane	3194-55-6;
Penta-BDE	2567994 32534-81-9	Penta-BDE	2567994 32534-81-9
Octa-BDE	32536-52-0	Octa-BDE	32536-52-0
Deca-BDE	1163-19-5	Deca-BDE	1163-19-5
Polybrominated Diphenyl Ethers (PBDEs)	Several	Polybrominated Diphenyl Ethers (PBDEs)	Several
Tetrabromobisphenol A	79-94-7	Tetrabromobisphenol A	79-94-7
Tris(1,3-dichloro-2-propyl)phosphate	13674-87-8	Tris(1,3-dichloro-2-propyl)phosphate	13674-87-8
Phthalates			
Bis(2-ethylhexyl)phthalate	117-81-7	Bis(2-ethylhexyl)phthalate	117-81-7
Butyl benzyl phthalate	85-68-7	Butyl benzyl phthalate	85-68-7
Dibutyl phthalate	84-74-2	Dibutyl phthalate	84-74-2
Halogenated Polymers			
Polyvinyl chloride (PVC)	9002-86-2	Polyvinyl chloride (PVC)	9002-86-2
Polyvinylidenechloride (PVDC)	9002-85-1	Polyvinylidenechloride (PVDC)	9002-85-1
Chlorinated polyvinyl chloride (CPVC)	68648-82-8	Chlorinated polyvinyl chloride (CPVC)	68648-82-8
Polychloroprene	9010-98-4	Polychloroprene	9010-98-4
		Polytetrafluoroethylene (PTFE)	9002-84-0
Chlorinated Hydrocarbons			
1,2-Dichlorobenzene	95-50-1	1,2-Dichlorobenzene	95-50-1
1,3-Dichlorobenzene	541-73-1	1,3-Dichlorobenzene	541-73-1
1,4-Dichlorobenzene	106-46-7	1,4-Dichlorobenzene	106-46-7
1,2,4-Trichlorobenzene	120-82-1	1,2,4-Trichlorobenzene	120-82-1
1,2,4,5-Tetrachlorobenzene	95-94-3	1,2,4,5-Tetrachlorobenzene	95-94-3
Pentachlorobenzene	608-93-5	Pentachlorobenzene	608-93-5
Hexachlorobenzene	118-74-1	Hexachlorobenzene	118-74-1

[101] Cradle to Cradle (2012): Banned Lists of Chemicals – Cradle to Cradle Product Standard Version 3.0, accessed at http://www.c2ccertified.org/images/uploads/C2CCertified_Banned_Lists_V3_121113.pdf

[102] Any material that cannot be processed by biological systems

[103] A product usable by defined living organisms to carry on life processes

Table A2-21: Substances banned from use in Cradle to Cradle certified products as intentional inputs of above 1,000ppm[101]			
Banned technical nutrient[102]	**CAS #**	**Banned biological nutrient[103]**	**CAS #**
PCB and Ugilec	Several	PCB and Ugilec	Several
Short-chain chlorinated paraffins	Several	Short-chain chlorinated paraffins	Several
Other			
Pentachlorophenol	87-86-5	Pentachlorophenol	87-86-5
Nonylphenol	104-40-5, 84852-15-3	Nonylphenol	104-40-5, 84852-15-3
Octylphenol	27193-28-8	Octylphenol	27193-28-8
Nonylphenol ethoxylates	Several	Nonylphenol ethoxylates	Several
Octylphenol ethoxylates	Several	Octylphenol ethoxylates	Several
Tributyltin	688-73-3	Tributyltin	688-73-3
Trioctyltin	869-59-0	Trioctyltin	869-59-0
Triphenyltin	892-20-6	Triphenyltin	892-20-6
Perfluorooctane sulfonic acid	1763-23-1	Perfluorooctane sulfonic acid	1763-23-1
Perfluorooctanoic acid	335-67-1	Perfluorooctanoic acid	335-67-1
Polycyclic Aromatic Hydrocarbons			
		PAH group (as defined in TRI)	Not applicable
		Benzo(a)pyrene	50-32-8
		5-Methylchrysene	3697-24-3
		Acenaphthene	83-32-9
		Anthracene	120-12-7
		Benz(a)anthracene	56-55-3
		Benz(j)aceanthrylene	202-33-5
		Benzo(b)fluoranthene	205-99-2
		Benzo(c)phenanthrene	195-19-7
		Benzo(g,h,l)perylene	191-24-2
		Benzo(j)fluoranthene	205-82-3
		Benzo(k)fluoranthrene	207-08-9
		Chrysene	218-01-9
		Cyclopenta(c,d)pyrene	27208-37-3
		Dibenzo(a,h)anthracene	53-70-3
		Dibenzo(a,h)pyrene	189-64-0
		Dibenzo(a,i)pyrene	189-55-9
		Dibenzo(a,l)pyrene	191-30-0
		Fluoranthene	206-44-0
		Fluorene	86-73-7
		Indeno(1,2,3,c,d)pyrene	193-39-5
		Naphthalene	91-20-3
		Phenanthrene	85-01-8
		Pyrene	129-00-0

Testing/assessment

Material assessments are completed for each homogeneous material above 0.01% (or 100ppm). There are different stages to the Material Health Assessment Process, these have been reviewed and summarised below[104].

Chemical hazard profiling

The profiling methodology uses 24 human health, environmental health and chemical class endpoints to evaluate a chemical according to a "traffic light" hierarchy, Table A2-22, which is based on the criteria for each hazard endpoint.

Table A2-22: Hazard rating system for chemicals using the Cradle to Cradle Certified Chemical Profiling Methodology

Rating	Details
GREEN	No hazard identified for the given endpoint
YELLOW	Borderline hazard identified for the given endpoint
GREY	No data available to determine hazard level for this endpoint
RED	Considered hazardous for this specific endpoint

Exposure assessment

There are two aspects to this test; firstly a series of questions identifies the product interaction scenarios under probable routes of exposure. The base material matrix is used to estimate the likelihood of additives or components diffusing into the environment during and after the products use.

Hazard x exposure – single risk assessment

If the exposure assessment identifies a potential concern, this information is combined with the chemical hazard information to give a risk assessment rating for each homogenous material as below.

[104] MBDC, LLC (2012): Material Health Assessment Methodology: Cradle to Cradle Certified Product Standard Version 3.0, report prepared for Cradle to Cradle, accessed at http://c2ccertified.org/images/uploads/C2CCertified_Material_Health_Methodology_121112.pdf

Table A2-23: Risk Assessment Rating System	
Rating	**Details**
A	This material is ideal from a human and environmental health perspective for the defined product scenarios in which it exists.
B	No moderate or significant risks identified for the given use scenarios.
C	One or more moderate risks identified for the material and/or one or more process chemicals where evaluated.
X	One or more significant risks identified for the material and/or one or more process chemicals subject to review at any level.

Cyclability assessment

Following on from the product interaction scenarios of the exposure assessment, each homogenous material is rated for its cyclability, a measure of how easy it is to recycle the article at the end of its life.

The Final ABC-X Material Assessment

The final rating is determined by combining the Single Risk Assessments and Cyclability Assessments, whereby the lowest rating is used.

Table A2-24: Final ABC-X Material Assessment Rating System	
Rating	**Details**
A	The material is ideal from a Cradle to Cradle perspective for the product in question.
B	The material largely supports Cradle to Cradle objectives for the product.
C	Moderately problematic properties of the material in terms of quality from a Cradle to Cradle perspective are traced back to the ingredient. The material is still acceptable for use.
X	Highly problematic properties of the material in terms of quality from a Cradle to Cradle perspective are traced back to the ingredient. The optimisation of the product requires phasing out this ingredient or material.
GREY	This material cannot be fully assessed due to either lack of complete ingredient formulation, or lack of toxicological information for one or more ingredients.
Banned	BANNED FOR USE IN CERTIFIED PRODUCTS This material contains one or more substances from the Banned List and cannot be used in a certified product.

If a product contains a banned chemical, it will not be certified through this scheme[105].

[105] Cradle to Cradle (2012): Banned Lists of Chemicals – Cradle to Cradle Certified Product Standard Version 3.0, accessed at http://www.c2ccertified.org/images/uploads/C2CCertified_Banned_Lists_V3_121113.pdf

Communicating conformity

Products which comply with the requirements are listed on the Cradle to Cradle website and are permitted to use the logo subject to terms of use.

Objectivity/impartiality

Accredited Assessment Bodies are used for testing, analysis and evaluation of applications and products. A list of bodies is available on the scheme website.

Extent of use of the scheme

Whilst there are certified products on the Cradle to Cradle website, it is unclear if these are available on the European market and whether the Vugge til Vugge scheme has its own database of products.

German Society for Sustainable Building Navigator (DGNB Navigator)[106]

Introduction

In 2011 the German Society for Sustainable Building (DGNB) introduced the Navigator scheme, an online database which provides technical information about the characteristics of construction products to all those involved in the building and construction sector. The DGNB Navigator was introduced after initial experience with DGNB system showed that there was a need for product-level information[107].

Objectives of the scheme

The scheme seeks to facilitate the planning and realisation of sustainable buildings by providing information about construction products. The scheme serves as an important link between construction products and the DGNB System building certification scheme, with product data being presented in the context of DGNB Systems criteria[108].

The objectives of scheme are based on environmental, economic and social-cultural considerations and include the indoor air quality and thus of user health and comfort. It is of interest that when used in conjunction with DGNB System, the goals and criteria change depending on the purpose of the building in which building materials are used; for example,

106 Deutsche Gesellschaft für Nachhaltiges Bauen

107 Pers. comm. with DGNB, 7th August 2013

108 DGNB Navigator website: About the DGNB Navigator, accessed at http://www.dgnb-navigator.de/&prev=/search%3Fq%3Ddgnb%2Bnavigator%26biw%3D946%26bih%3D920

different criteria apply to an industrial installation and to a kindergarten. Some of the criteria are relevant to worker health while others relate to consumer health[109].

Currently, the DGNB Navigator scheme is primarily aimed for use by professionals (architects and contractors) but DGNB believes that in the future information provided by the scheme will be increasingly accessed by consumers[110].

Geographical coverage

The DGNB Navigator is applied across Europe but Germany is its strongest market accounting for 90% of its business. Outside Germany, DGNB Navigator is active in German speaking countries, some Nordic countries, Central and Eastern European countries and China. To a lesser degree, DGNB Navigator is also active in Southern Europe. On the other hand, the scheme is rarely applied in Sweden and many Western European countries[111].

Focus of the scheme (content vs. emissions)

Manufacturers are required to declare the content of products including harmful or dangerous substances under the 'Local Environmental Impact' section and the emissions under the 'Indoor air quality' section e.g. TVOC and formaldehyde. This is largely dependent on the product type. One of the reasons why this scheme also considers product content (and not just emissions) is that content is relevant from the life-cycle perspective[112].

Products covered

The majority of the product groups are construction products, although there are some non-construction products:

[109] Pers. comm. with DGNB, 7th August 2013
[110] Ibid.
[111] Ibid.
[112] Ibid.

- doors, windows and window systems;
- surface treatments and coatings;
- ventilation systems;
- external wall cladding and façade systems;
- interior walls, inner wall cladding and building boards;
- mortars and screeds;
- ceiling coverings and ceiling systems;
- flooring and floor systems;
- roofing materials and waterproofing systems;
- water and wastewater systems;
- lighting;
- insulation;
- metal building materials;
- adhesives; and
- services, e.g. engineering services, project management, facility services.

Substances covered (including award criteria)

As noted above, assessment by DGNB Navigator encompasses environmental, economic and health aspects of the product[113]. Some of the product characteristics which the criteria cover are energy requirements, life cycle costs, emissions behaviour, life cycle assessment or classification of harmful substances.

Content limits include but are not limited to the following:

- lead;
- chromium and its compounds;
- tin;
- VOC; and
- cadmium.

Emission limits include but are not limited to the following:

- Formaldehyde;
- TVOC; and
- VOC.

Testing/assessment

[113] DGNB Navigator website: DGNB navigator for construction, accessed at http://translate.google.co.uk/translate?hl=en&sl=de&u=http://www.dgnb-navigator.de/&prev=/search%3Fq%3Ddgnb%2Bnavigator%26client%3Dfirefox-a%26hs%3DCtF%26rls%3Dorg.mozilla:en-US:official

Information on the product is entered directly into the online database by the manufacturer following registration. Data have to be referenced and data sources include Safety Data Sheets, EPDs or VOC data from AgBB. In addition, products that do not conform to the philosophy of the DGNB can be refused registration but the DGNB has not made use of this option as of yet[114]. In addition, the DGNB has commenced work on developing more extensive exclusion criteria for products seeking to be listed in the Navigator database but these are not yet in place. The data are quality assured by DGNB, using the options below:

- externally audited specific product information e.g. product EPD;
- externally audited industry specification e.g. association EPD;
- average/standard values; and
- unaudited manufacturer e.g. self-made LCA[115].

Communicating conformity

Products are listed in the online database which complements the DGNB Certification System criteria. Manufacturers are also permitted to use DGNB Navigator logo, which has a unique registration number, on their product or in corporate communications.

Objectivity/impartiality

DGNB is a non-profit and non-governmental organisation.

Extent of use of the scheme

The DGNB Navigator database is free to access and provides detailed information for each product or service, including the outcomes for each relevant indicator. 229 products are currently listed[116]. The products are classified into product groups and subgroups. The products have been classified into the mandate codes and are displayed in Table A2-25 below. Roughly 83% are classified as construction products for the purpose of this study.

Table A2-25: Products certified under DGNB Navigator[117]

Mandate	Type	Number of products	Products in scheme
M101	Doors, windows	12	Doors (7), Windows and window systems (5)

[114] Pers. comm. with DGNB, 7th August 2013

[115] DGNB Navigator website: Certainly on the right track – The DGNB navigator for construction, accessed at http://translate.google.co.uk/translate?hl=en&sl=de&u=http://www.dgnb-navigator.de/&prev=/search%3Fq%3Ddgnb%2Bnavigator%26client%3Dfirefox-a%26hs%3DCtF%26rls%3Dorg.mozilla:en-US:official

[116] Pers. comm. with DGNB, 7th August 2013

[117] DGNB Navigator website: Products with DGNB label, accessed at http://www.dgnb-navigator.de/Product

Table A2-25: Products certified under DGNB Navigator[117]			
Mandate	**Type**	**Number of products**	**Products in scheme**
M103	Thermal insulating products	11	Insulation (11)
M108	Curtain walling	27	External wall cladding and façade systems (14), Interior walls (6), Inner wall cladding and building boards (7)
M109	Fixed fire-fighting equipment	7	Ventilation systems (6), Smoke control (1)
M118	Waste water disposal	30	Water and wastewater systems (30)
M119	Floorings	28	Flooring and floor systems (28)
M120	Structural metallic products	1	Metal building materials (1)
M121	Wall and ceiling finishes	7	Ceiling coverings and ceiling systems (7)
M122	Roof coverings	20	Roofing tiles (2), Roofing and waterproofing systems (18)
M127	Adhesives	7	Adhesives (7)
M128	Concrete, mortar & grout	22	Material and floor screed (1), Mortars and screeds (21)
N/A	Other construction products	8	Room acoustics and noise control (3), Sun and glare protection (4), Solid materials (1)
N/A	Non-construction products	37	Surface treatments and coatings (25), Services - facility services (1) , Services - project management (1), Lighting (9), Services - engineering services (1)

Ecocycle Council – Building Product Declarations (BPD3, Sweden)

Introduction

BPD3 is a voluntary system for reporting and assessing the environmental performance of building products (however, it appears that the scheme is also used by companies to choose suitable products not only regarding their environmental properties but also with respect to human health). It is a part of the Environmental Programme 2010 of the Swedish Ecocycle Council. The scheme has been in existence for over 15 years and provides an industry-wide format for communicating information about environmental impacts of construction

products. The current version of the Building Product Declarations follows two previous versions published in 1997 and 2000, and as such, it is called BPD3[118].

The updated BPD guidance was developed within the framework of the Swedish Ecocycle Council's 'Phasing Out Hazardous Substances' Action Programme by a working group comprising the building materials industry, construction clients and property owners, architects and technology consultants as well as contractors, taking into account the views of the Swedish Chemicals Agency and other stakeholders[119].

Objectives of the scheme

The objective of the scheme is twofold:

- to enable the environmental assessment of building products in the project design/construction/use stage, i.e. to assist with the choice of the most suitable building product; and
- to enable documentation of built-in products to assist with future actions, such as demolition or waste management.

BPDs provide information that is relevant to:

- energy housekeeping;
- materials housekeeping;
- phasing out hazardous substances; and
- guaranteeing a good indoor environment.

Geographical coverage

This appears to be a Swedish national scheme.

Focus of the scheme (content vs. emissions)

This scheme requires that information is provided on the content of as well as emissions from the product.

Products covered

It has not been possible to discern the exact products which this scheme covers, however literature suggests that all construction products are covered.

[118] Kretsloppsradet (2007): Building Product Declarations – Ecocycle Council guidelines (BPD3), accessed at http://www.vvsfabrikanterna.se/upload/pdf-dokument/071026_Guidelines_BPD_3.pdf

[119] Kretsloppsradet (2007): Building Product Declarations – Ecocycle Council guidelines (BPD3), accessed at http://www.vvsfabrikanterna.se/upload/pdf-dokument/071026_Guidelines_BPD_3.pdf

Substances covered (including award criteria)

BPD3 requires that complete information on the chemical content has to be provided for all types of products. This includes both the chemical content of the product at the time of delivery as well as during the use phase.

For some substance categories, the BPD must also provide information on their proportion by weight in the whole product if their content is equal to or exceeds certain reporting thresholds, Table A2-26. This excludes metals including alloys that are fixed in the construction product during its use in the case where the entire product is not classified as hazardous. The weight of minerals, ores or other naturally occurring substances and raw materials do not have to be declared unless classified as hazardous.

Reporting of substances present in below-threshold levels is encouraged. On the other hand, certain exemptions are provided for substances whose inclusion in the BPD would breach company confidentiality.

Testing/assessment

Manufacturers are required to complete a standard application form, which includes information on whether the product is registered with BASTA and whether the product has been awarded another Ecolabel.

The complete chemical content must be declared as they are when delivered (excluding packaging), and where appropriate its risk classification is to be provided as well. Where the chemical contents change, it is also necessary to list the contents of the final fully thermoset composition. As noted above, for some substance categories, the BPD must also provide information on their proportion by weight in the whole product if their content is equal to or exceeds certain reporting thresholds. These substance categories and the associated thresholds are provided below.

Table A2-26: Substances to be reported by weight in BPDs[120]	
Substance Category	**Threshold**
Highly toxic	0.1 %
Toxic	
Carcinogenic (Categories 1&2)	

[120] See www.kretsloppsradet.com

Mutagen (Categories 1&2)	
Toxic to reproduction (Categories 1&2)	
Harmful to health	1 %
Corrosive	
Irritant	
Allergenic	
Carcinogenic (Category 3)	
Mutagen (Category 3)	
Toxic to reproduction (Category 3)	
Harmful to the environment with a hazard symbol	0.1 %
Harmful to the environment with a hazard symbol and risk phrase R59	
Harmful to the environment without a hazard symbol	1%
Pure substances or compounds of cadmium (Cd) and organic substances which are highly persistent and bio-accumulable or persistent, bio-accumulable and toxic	0.01%
Substances that are ozone depleting (R59) or pure substances or compounds of lead (Pb) and mercury (Hg)	0.1%
All other substances if the KIFS (Swedish Chemicals Agency Regulations on the Classification and Labelling of Chemical Products) does not indicate other content limits	2%
Note: Information does not need to be provided if patent or classified information might be revealed.	

Communicating conformity

Information is communicated by means of a product declaration. In this respect, it is of interest that the Swedish Ecocycle Council notes that "a good level of competence is required by the person assessing the environmental properties of a building product based on the BPD." This includes a certain degree of knowledge of both chemistry and construction[121].

Objectivity/impartiality

Information provided is based on that supplied by the manufacturer of the relevant product.

Extent of use of the scheme

In 2006 the Swedish Ecocycle Council estimated that around 4,000 – 5,000 products had provided declarations. The majority of these are published on internet sites of companies selling these products. The Swedish Ecocycle Council further notes that some industry sectors have produced BPDs en masse and "several players within the sector currently use data from BPDs for choosing building products with regard to environmental properties and human health". However, a document published by the Swedish Ecocycle Council in 2007

[121] Kretsloppsradet (2007): Building Product Declarations – Ecocycle Council guidelines (BPD3), accessed at http://www.vvsfabrikanterna.se/upload/pdf-dokument/071026_Guidelines_BPD_3.pdf

notes that the uptake of BPDs and the quality of information provided therein did not match the expectations that the sector and the Swedish Ecocycle Council had prior to adopting the scheme; the reasons for this were said to include difficulty in generating the required data and a perception of a lack of demand for these declarations on the part of those purchasing construction products[122].

Eco-Institut Label (Germany)

Introduction

The eco-INSTITUT GmbH is a business that can test products against international and national standards.

Objectives of the scheme

In addition to the above, eco-INSTITUT GmbH can award the eco-INSTITUT label to products with low emissions and low pollutants. Testing services can be provided for manufacturers, businesses, importers and exporters worldwide.

Geographical coverage

The eco-INSTITUT label was founded in Germany.

Focus of the scheme (content vs. emissions)

Products can also be awarded the eco-INSTITUT label if they meet emissions and content requirements.

Products covered

The eco-INSTITUT label is aimed at a range of products which include construction products, mattresses, bedding and furniture.

Substances covered (including award criteria)

With regard to the content of the product, some substances must not be used in the products whilst others are only permitted if they comply with established threshold limits (Table A2-27). To ensure transparency, all of the materials that are used within the product must be declared.

[122] Kretsloppsradet (2007): Building Product Declarations – Ecocycle Council guidelines (BPD3), accessed at http://www.vvsfabrikanterna.se/upload/pdf-dokument/071026_Guidelines_BPD_3.pdf

Table A2-27: Substances prohibited from use in construction products[123]
Prohibited substances under Regulation (EC) No 1272/2008, Ordinance on Hazardous Substances, TRGS, national law (D, A, NL)
POPs (Persistent Organic Pollutants)
Substances according to the MAK list III1 and III2
Substances according to Regulation (EC) No 1272/2008 Categories Carc. 1A and 1B, Muta. 1A and 1B, 1A and 1B Repr
Substances according to Rule 905 K1 and K2, M1 and M2, R1 and R2
Substances according to IARC Group 1 and 2a
Substances with hazard symbol N in liquid products except aliphatics
Substances with hazard symbol N, whose classification is not based on the combined R-phrase R 51 / R 53
Substances with hazard symbol N, whose classification is based on the R-combination R 51 / R 53> 1%
Substances with hazard symbol T +
Substances with hazard symbol T:> 0.1%
Materials with the following R: R 26, R 27, R 28, R 45, R 46, R 48, R 49 Materials with the following R> 0.1%: R 23, R 24, R 25, R 60, R 61, R 62, R 63, R 65 Substances with combinations in which one of the R-phrases mentioned above occurs
Substances with class 3 According to CITI or OECD persistent accumulating (log Pow> 3) substances with LC5010 mg / l
Arsenic, lead, cadmium, mercury and compounds
Organotin compounds
Antimony trioxide
Barium compounds, except barium sulphate
Pyrethroids
HFC
Organophosphates
Phthalates (except PET)
Organic halogen compounds

There are further requirements related to specific construction products. Although the requirements are broadly the same, sealants have additional restrictions for flame retardants whilst wood based materials have no requirements for phthalates (Table A2-28).

[123] eco-INSTITUT website: Certified products, accessed at http://www.eco-institut.de/en/certified-products/

Table A2-28: Content related requirements for construction products[124]				
Mineral building products	**Wood-based materials**	**Wood flooring, laminate, panels**	**Adhesives**	**Sealants**
AOX (absorbable organic halogen Compounds) ≤ 1.0 mg / kg	AOX (absorbable organic halogen Compounds) ≤ 1.0 mg / kg	AOX (absorbable organic halogen Compounds) ≤ 1.0 mg / kg	AOX (absorbable organic halogen Compounds) ≤ 1.0 mg / kg	AOX (absorbable organic halogen Compounds) ≤ 1.0 mg / kg
EOX (extractable organic halogen Compounds) ≤ 2.0 mg / kg	EOX (extractable organic halogen Compounds) ≤ 2.0 mg / kg	EOX (extractable organic halogen Compounds) ≤ 2.0 mg / kg	EOX (extractable organic halogen Compounds) ≤ 2.0 mg / kg	EOX (extractable organic halogen Compounds) ≤ 2.0 mg / kg
Phthalates (plasticisers, sum) DMP, DEP, DPP, DBP, BBP, DEHP, DOP, DINP, DIDP, DIPB ≤ 500 mg / kg		Phthalates (plasticisers, sum) DMP, DEP, DPP, DBP, BBP, DEHP, DOP, DINP, DIDP, DIPB ≤ 500 mg / kg	Phthalates (plasticisers, sum) DMP, DEP, DPP, DBP, BBP, DEHP, DOP, DINP, DIDP, DIPB ≤ 500 mg / kg	Phthalates (plasticisers, sum) DMP, DEP, DPP, DBP, BBP, DEHP, DOP, DINP, DIDP, DIPB ≤ 500 mg / kg
				Organophosphorus flame retardants (Limit for each individual substance) TMP, TEP, TPP, TiBP, TBP, TDBPP, TCEP, TCPP, TDCPP, TEHP, TBEP, TPhP, CPM ≤ 1 mg / kg

Testing/assessment

Products are tested/assessed outside the production plant (pers. comm., 2013).

Communicating conformity

Products that meeting the criteria carry the eco-INSTITUT label. Products are also awarded a certificate which can be viewed on the eco-INSTITUT website. This contains information on the tests program, test results and when the certification expires.

Objectivity/impartiality

Compliance with ISO/IEC 17025 accreditation ensures that the testing activities undertaken by eco-INSITITUT remain objective and impartial.

[124] eco-INSTITUT website: Certified products, accessed at http://www.eco-institut.de/en/certified-products/

Extent of use of the scheme

The types of products that can be certified under this scheme are shown in Table A2-29; around 36% of the products are classified as a construction product.

Table A2-29: Products certified under ECO-Institut[125]			
Mandate	**Type**	**Number of products**	**Products in scheme**
M119	Floorings	41	Wood Flooring / Laminate / Panels (41)
M127	Adhesives	4	Adhesives / Glues Flooring (4)
M/474	Sealants for non-structural use in joints in buildings and pedestrian walkways	6	Sealing Materials (6)
N/A	Other construction products	48	Wood-based materials (MDF, particle boards, OSB) (16) Mineral building products (32)
N/A	Non-construction products	176	Paint and coating materials (5), Mattresses (89), Bedding (57), Furniture (24) , Consumer Goods (1)

ECOproduct (Norway)

Introduction

This is a voluntary Norwegian system that allows users to select environmentally friendly construction materials and products based on information in an Environmental Product Declaration. It has been developed in collaboration with SINTEF, Building AS, Norwegian Building Service and NAL/EcoBe Ox.

Objectives of the scheme

The scheme aims to provide sufficient information that allows users to select construction products which do not pose a threat to human health or the environment.

Geographical coverage

ECOproduct is a national scheme mainly used in Norway.

Focus of the scheme (content vs. emissions)

[125] eco-INSTITUT website: Certified products, accessed at http://www.eco-institut.de/en/certified-products/

There are four assessment areas which are considered individually and finally together to produce one overall score for the product[126].

Indoor air

The assessment of indoor air suitability is based on the test methods developed by the Finnish Indoor Air Quality scheme. Thus it considers TVOC, formaldehyde, ammonia and carcinogenic substances with issues of particles and fibres. There are defined limit values for each respective parameter (green, white and red). All of the potential emissions are combined to produce one overall result for the products indoor emissions.

Content of health-hazardous substances

See below

Greenhouse effect

This takes into account CO_2 emissions.

Use of resources

This considers the raw materials, specifically whether they are renewable or sustainable, that will be used throughout the entire life cycle of the product. Other factors taken into consideration include the amount and type of energy used by the product, how this energy use will impact global warming and the type and the quantity of waste resulting from the use of the product. All of this information is individually calculated and then combined to produce an overall score.

Products covered

Several product groups are covered by the scheme, including:

- doors, windows and gates;
- waterproof membranes;
- insulation;
- flooring;
- wall coverings;
- joint sealant/paste;
- building boards and facades;
- concrete, wood and steel; and
- furniture.

[126] ECOroduct (2008): Method Description – Version 2.0, accessed at http://www.byggtjeneste.no/Artikkelbilder/Produkter/ECOproduct/Metodebeskrivelse%20Ecoproduct%20%20SINTEF%20Byggforsk%2009122008.pdf

Substances covered (including award criteria)

Products are assessed and graded (red, white and green) against in 4 areas, see Table A2-30[127]. The Health and hazardous substances assessment area shall be explored further.

Table A2-30: Parameters considered under each assessment area	
Assessment Area	**Substance considered**
Indoor air quality	TVOC, formaldehyde, ammonia and carcinogenic substances with particles and fibres
Health and hazardous substances	Health and environmentally hazardous chemicals in production and in the finished product
Greenhouse effect	Emissions measured in CO_2 equivalents
Resource consumption	Type of raw material parameters, the type and amount of energy and the type and amount of waste generated

There are 2 parameters within the Health and hazardous substances area, the first focuses on chemicals which are hazardous to human health and/or the environment during production, whilst the second is concerned with the presence of these chemicals in the finished product. The classification is based on R-phrases, which have been divided into groups (Table A2-31), and the presence of substances classified as PBT, vPvB, which cause serious long term effects on health and are very toxic to the environment. For the purposes of classifying a product, these are considered Group 1 substances.

Table A2-31: Classification of R-phrases for the ECOproduct[128]	
Group	**R-phrases**
Group 1: CMR substances	R40, R45, R46, R49, R60-63 (R64, R215)
Group 2: Acute toxic (very toxic / toxic)	R23 – R28
Group 3: Chronic effects	R33, R39, R48, R68 (R41, R65, R66)
Group 4: Sensitizing/Allergy	R42, R43
Group 5: Environmentally harmful	R51 – R59 (R50)
Group 6: Harmful (corrosive, harmful, irritant)	R20, R21, R22, R34 – R38 (R29, R31, R32, R67)
Group 7: Groups without a marking or explosive or flammable	R1 – R19 (R30, R44)

[127] Byggtjeneste website: ECOproduct, accessed at http://translate.google.co.uk/translate?hl=en&sl=no&u=http://www.byggtjeneste.no/&prev=/search%3Fq%3Dhttp://www.byggtjeneste.no/WPpages/Forsiden.aspx%26client%3Dfirefox-a%26hs%3Dnah%26rls%3Dorg.mozilla:en-US:official

[128] ECOproduct (2008): Method Description – Version 2.0, accessed at http://www.byggtjeneste.no/Artikkelbilder/Produkter/ECOproduct/Metodebeskrivelse%20Ecoproduct%20%20SINTEF%20Byggforsk%2009122008.pdf

R-phrases have been allocated to groups, with different criteria associated with each group. There are different criteria for each Group which reflects its importance. If a product qualifies for multiple groups, it will need to satisfy the criteria of the highest Group. Table A2-32 and Table A2-33 show the assessment criteria during production and the finished product, as well as the awarded grade.

Table A2-32: Assessment criteria for hazardous chemicals in production for ECOproduct[129]

Group	None	Trace amounts	<2% (weight)	≥2% (weight)	≥10% (weight)	≥20% (weight)	Grade	Score
No marking or marked flammable	1	1	1	1	1	1	Excellent	1
Harmful	1	2	2	3	4	7	Good	2
Environmentally harmful	1	2	3	4	5	8	Average to good	3
Sensitising	1	2	4	5	6	8	Average	4
Chronic effects	1	2	5	6	7	8	Adjoining average	5
Acute toxic (very toxic)	1	2	6	6	7	8	Marginally average	6
CMR effects, PBT, vPvB	1	2	7	7	7	8	Poor	7
Priority list	1	2	8	8	8	8	Unacceptable	8

[129] ECOproduct (2008): Method Description – Version 2.0, accessed at http://www.byggtjeneste.no/Artikkelbilder/Produkter/ECOproduct/Metodebeskrivelse%20Ecoproduct%20%20SINTEF%20Byggforsk%2009122008.pdf

Table A2-33: Assessment criteria for hazardous chemicals in the finished product for ECOproduct[130]								
Group	None	Trace amounts	<2% (weight)	≥2% (weight)	≥10% (weight)	≥20% (weight)	Grade	Score
No marking or marked flammable	1	1	1	1	1	1	Excellent	1
Harmful	1	2	3	4	6	7	Good	2
Environmentally harmful	1	2	4	5	7	7	Average to good	3
Sensitising	1	2	5	6	7	8	Average	4
Chronic effects	1	2	6	6	7	8	Adjoining average	5
Acute toxic (very toxic)	1	2	6	7	7	8	Marginally average	6
CMR effects, PBT, vPvB	1	2	7	7	7	8	Poor	7
Priority list	1	2	8	8	8	8	Unacceptable	8

Testing/assessment

The assessment procedure consists of 4 stages:

- manufacturer provides documentation for the product to be assessed in the form of an Environmental Product Declaration;
- environmental data are assessed against the criteria for each parameter in the methodology;
- results are calculated for the various parameters; and
- results are aggregated for each of the assessment areas.

Communicating conformity

The information gathered is used to present the products on a subscription based database, which involves a grading system using green, white and red symbols.

Objectivity/impartiality

The information to evaluate the product is gathered from the EPD documentation (EPD ISO 14025). Using this information, rather than data from a manufacturer or supplier, ensures a degree of objectivity.

Extent of use of the scheme

[130] Ibid.

It has not been possible to gather information on the number of products currently certified by ECOproduct. However Table A2-34 below outlines the product groups for which there are criteria.

Table A2-34: Products groups certified under ECOproduct			
Mandate	**Type**	**Number of product groups**	**Products in scheme**
M101	Doors, windows	1	Doors, windows, doors, gates and windows (1)
M102	Membranes	1	Waterproof membranes (1)
M103	Thermal insulating products	1	Insulation (1)
M119	Floorings	1	Flooring / parquet floors / carpets M. M. (1)
M121	Wall and ceiling finishes	1	Internal linings / wallpaper (1)
M/474	Sealants for non-structural use in joints in buildings and pedestrian walkways	1	Joint Sealing / paste (1)
N/A	Other construction products	5	Building hardware (1), Building boards (1), Cover of concrete / wood / steel (1), Façade (1), Columns of concrete/wood/steel (1)
N/A	Non-construction products	3	Furniture (1), Fireplaces (1), Coating, impregnation (1)

Additional information

The ECOproduct is administered by the Byggtjneste, which also oversees the Norwegian Building Materials Base (NOBB). This database contains information on all building materials and construction products that are sold in Norway. Suppliers and manufacturers supply the data, very often following a template devised by Byggtjeneste, which allows users of the database to easily compare products. This particular database is tailored to those who work within the construction sector, with users including:

- builders and contractors;
- engineers/architects/developers; and
- public authorities[131]

EMICODE (Germany)

[131] Byggtjeneste website: ECOproduct, accessed at http://www.byggtjeneste.no/WPpages/Produkter/NOBBskanner.aspx

Introduction

The purpose of the EMICODE product classification system is to provide a review and differentiation between materials in respect of their impacts on users' and installers' health and safety as well as the environment. EMICODE is run by the Association for the Control of Emissions in Products for Flooring Installation, Adhesives and Building Materials (GEV)[132], which was set up in 1997 by German adhesive manufacturers.

Objectives of the scheme

The aim of the EMICODE scheme is to ensure that compliant construction products do not present a hazard to the health of users and installers in terms of emissions and also have the lowest possible impact on the environment[133].

While the main target group of this scheme are building contractors, some products, such as adhesives, can also be purchased by consumers and as such it is also possible that consumers take EMICODE classification into account in their purchasing decisions[134].

Geographical coverage

Only companies that are members of GEV can apply for an EMICODE classification. Currently, GEV has 89 members from the following countries (however, please note that six companies are not manufacturers of construction products but rather producers of raw materials[135]):

- Austria;
- Belgium;
- Canada;
- Denmark;
- France;
- Germany;
- Italy;
- Netherlands;
- Slovenia;
- Spain;
- Switzerland;
- Turkey; and

[132] Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e. V.
[133] Personal communication with GEV-EMICODE, 6th August 2013.
[134] Ibid.
[135] Ibid.

- United Kingdom.

One of the reasons for restricting the participation in the EMICODE scheme to members of the GEV association is that membership provides a useful tool for the ensuring compliance with the EMICODE scheme. For example, member companies commit themselves to abide by GEV's constitution[136].

As regards countries where EMICODE-classified adhesives are sold, EMICODE has almost 100% coverage for floor installation products in Germany, Austria, Switzerland and the Netherlands whilst in Italy more than 50% of floor installation products are covered. Based on the development of the scheme to date, GEV expects that EMICODE will expand to other countries[137].

Focus of the scheme (content vs. emissions)

For each product category and classification level, there are specific basic requirements that a product must meet relating to emissions and the content of the product. The reason for adopting a mixed approach is that for some substances it is easier to have a ban rather than an emissions test and it is not practicable to test for emissions of all substances[138].

Products covered

Criteria exist for several products groups used in floor covering, parquet and tiling work, including:

- liquid products;
- mineral products e.g. cement and screeds;
- pasty products e.g. adhesives;
- ready for use products e.g. underlays, insulation boards;
- joint sealants, joint insulations, joint sealing tapes; and
- surface coatings for wood flooring.

GEV – as a non-profit organisation - refuses to take on new product categories just for the sake of a single company or a single product. Therefore, a new product category is only included if an industry branch or at several companies are willing to improve in the direction

[136] Personal communication with GEV-EMICODE, 6th August 2013.
[137] Ibid.
[138] Ibid.

of health and environment. The product registration is free of charge and the annual subscription fees are between €2,500 and €5,000 per member company[139].

Substances covered (including award criteria)

The EMICODE label aims to protect workers' and users' health by restricting certain chemicals and emissions. The focus of this report is on describing those GEV-EMICODE requirements on product content rather than those that specify emission limit values. On a broad level, substances that are classified as Category 1, 2 or 3 Acute Toxicity are not permitted under the EMICODE scheme. More specifically, products that contain the following specific substances or substances with the following properties shall not be awarded the EMICODE:

- substances that have been identified under REACH as being of very high concern[140] and have been listed in the candidate list[141];
- substances that are listed in the SDS with properties for which it is possible for that substance to be listed in the candidate list;
- for the purposes of occupational hygiene, methylethylketoxim (MEKO) and methylisobutylketoxim (MIBKO) must not be used in products; and
- emission controlled products must be free of solvents[142], the only exception being parquet surface treatment products[143].

The EMICODE label may also contain an 'R', thereby indicating that although the product meets the content requirements above, further precautions need to be taken when installing or using the product. This includes products that have to be labelled:

- in accordance with EU Directive 67/548/EEC (Dangerous Substances) and 45/1999/EC (Dangerous Preparations) or the CLP Regulation (EU) No. 1272/2008;
- with risk phrases (e.g. H or R);
- as hazardous preparations according to local law where the product is used (e.g. cement with materials that requires gloves and goggles to protect eyes and hands); or will form and release VOC by chemical reaction[144].

[139] Personal communication with GEV-EMICODE, 6th August 2013.
[140] REACH, Article 57
[141] REACH, Article 59
[142] For the purposes of GEV Classification criteria, defined as "VOC and their mixtures with a boiling point ≤ 200 °C, liquid at normal conditions (20 °C and 1013 hPa), which are used for solving or diluting other substances without changing their chemical characteristics" However, "solvent free products may contain traces of solvent (<0.5 weight-percent) due to contamination of ingredients".
[143] Classification Criteria – Controlled Building Materials, accessed at: http://www.emicode.com/fileadmin/redaktion/pdf/GEV_Classification_Requirements_2013-04-15.pdf
[144] Classification Criteria – Controlled Building Materials, accessed at: http://www.emicode.com/fileadmin/redaktion/pdf/GEV_Classification_Requirements_2013-04-15.pdf

GEV-EMICODE also requires that emissions controlled products are accompanied by an SDS, even where this is not a legal requirement.

As regards the reasons for using content based criteria, GEV stated that there are both technical reasons as well as market acceptance reasons. For example, it is better to exclude certain substances as it is too difficult to carry out an emissions test. In addition, some substances (such as oximes in sealants) are undesirable for reasons of preventing bad odour[145] and as such not desirable at all.

Testing/assessment

EMICODE operates a self-certification system but ensures compliance by means of spot-checks. Assessment criteria are drawn up centrally by technical experts and communicated by GEV to their members. Member companies of GEV subsequently organise the testing of their products, classify their products according to the criteria issued by GEV, and register the products in a licencing procedure, which is free of charge. The advantage of this approach is that it minimises the burden placed on manufacturers, which are afforded the flexibility to introduce slight changes to their formulations (e.g. adding water) or change brand names without having to undergo repeated centrally organised assessments. Together with the fact that schemes mainly rely on promotional activities undertaken by the manufacturers themselves, this means that the costs of the scheme are kept to a minimum[146].

Products that undergo spot checks are identified at random by GEV (although previous non-compliance can also be a reason for selecting certain products) and tests are carried out by independent test bodies. The number of products tested differs from year to year, primarily depending on the budget available. In the current year, the budget allocated to spot checks is €80,000 which means that around 30-50 products may be tested this year (with the overall annual budget of GEV-EMICODE being around €270,000). As regards non-compliance, the detection rate is usually quite low with only a few of the EMICODE-labelled products tested annually not being compliant with the criteria. However, last year, of the 12 products tested, three products were not compliant (these products belong to three different product categories and were made by three different manufacturers and the main reason for non-compliance was a recent change in raw materials used in these products). It was noted by GEV that this was the highest non-compliance rate identified to date.

[145] Personal communication with GEV-EMICODE, 6th August 2013.
[146] Ibid.

However, it was also noted that non-compliance may be becoming more common as requirements become more stringent (e.g. the EMICODE EC1 Plus award is based on much more challenging requirements) and the fact that emissions increase during storage. However, manufacturers are obliged to ensure that the products comply with the criteria even after a period of storage[147].

Products can also be tested by their competitors. When they identify non-compliance, they inform GEV which subsequently decides on the most appropriate sanctions.

Tests that are performed for other approval procedures or schemes may be used as evidence for compliance with the EMICODE criteria, provided the testing criteria used satisfy GEV requirements. For example, the procedures undertaken for German DIBt approval may be used. On the other hand, materials that comply with the EMICODE EC1 will also fulfil the requirements of other emission labels (e.g. Blue Angel). With regard to the requirements of the EMICODE, one stakeholder contrasted its low bureaucracy with that of complex national regulations such as the German DIBt which can act as a barrier to trade to foreign SMEs[148].

Communicating conformity

An EMICODE classification label is affixed to products that comply to set criteria. These labels categorise indoor installation products, adhesives and construction materials in the following categories:

- EMICODE EC1 Plus - indicating "very low emission";
- EMICODE EC1 - indicating "very low emission"; and
- EMICODE EC2 - indicating "low emission";

In addition, the letter "R" (which stands for regulated) can be added to the classification, meaning that while these products have low emissions, protective equipment may need to be used when applying them (e.g. protective gloves and/or goggles). [149]

Objectivity/impartiality

Testing laboratories must have a GEV test method chamber and be accredited according to ISO 17025 as a minimum requirement. This is required for any test lab applying the GEV test method be it on request of the GEV for checking purposes or a GEV member company

[147] Personal communication with GEV-EMICODE, 6th August 2013.

[148] GEV and EMICODE® - Questions and Answer: Accessed at: http://www.emicode.com/fileadmin/redaktion/pdf/30questionsanswers.pdf

[149] GEV and EMICODE®: Questions and Answer, accessed at http://www.emicode.com/fileadmin/redaktion/pdf/30questionsanswers.pdf

in order to classify a given product. Although certain testing laboratories are recommended based on the results of previous tests, no testing laboratory is excluded from being assigned in order to keep prices for tests competitive. However, any GEV member company is liable for the test result of a chosen test laboratory.

Extent of use of the scheme

As of 1st August 2013, there 3,222 products were certified with the EMICODE scheme (with approximately one-third being adhesives)[150], with almost 100% coverage for floor installation products in some countries. It was noted that the number of products certified has been steadily growing both due to the increasing number of GEV members as well as existing members certifying an increasing number of products. Table A2-35 gives an indication as to the product groups that are certified.

The scope of products that can be subjected to GEV tests and be assessed according to the product specific EMICODE evaluation has increased.

Table A2-35: Products certified under EMICODE-GEV[151]

Mandate	Type	Number of product groups	Products in scheme
M114	Cement	2	Cement and Calcium sulphate based levelling compounds (1), Cement based and other material tile mortars and joint fillers (1)
M119	Floorings	3	Underlays (1), Insulating underlays (1), Self-adhesive tapes and underlays (1)
M127	Adhesives	4	Ready to use thin fixations and adhesives (1), Pasty adhesives for floor coverings and parquet, ready to use adhesives for ceramic tiles, other adhesives (1), Pasty fixations for floor coverings (1), Powder based adhesives with high content of organic binder (1)
M128	Concrete, mortar & grout	2	Screeds and screed binding material (1), Levelling compounds (based on dispersion or reactive resin) (1)
M/474	Sealants for non-structural use in joints in buildings and pedestrian walkways	4	Liquid sealants (1), Joint sealants (based on dispersion or reactive resins), repair fillers (1), Joint insulations, expanding foams (1), Pre-compressed or foam plastic joint sealing tapes (1), Sealing membranes, tapes, sleeves for small surfaces (1), Sealing membranes for large surfaces (1)
n/a	Non-construction products	3	Primers (1), Damp proof primers and barrier products (1), Waterbourne wood floor coatings (1)

[150] Interview with GEV-EMICODE, 6th August 2013.
[151] GEV-EMICODE website, accessed at: http://www.emicode.com/index.php?id=31&L=1

GISCODE/GISBAU (Germany)[152]

Introduction

BG BAU[153] (the German institution responsible for statutory accident insurance and prevention in the construction sector) developed the hazardous materials information system for the construction sector or GISBAU (Gefahrstoffinformationssystem Bau) in 1989. It is this organisation that operates the GISCODE, which was launched in 1993[154]. Similar schemes have since been adopted by the chemicals and metals statutory accident insurance institutions[155]. These are institutions established by law and tasked with accident prevention as well as with funding the treatment of accidents and occupational diseases.

Objectives of the scheme

GISBAU and the GISCODE was developed in co-operation with the whole sector to help SMEs, as many have no toxicological knowledge or expertise, to reduce the risks that are presented by potentially hazardous substances in construction products by providing them with a clear and easy to understand indication of the hazards associated with substances and mixtures used in the construction industry, as well as with instructions on how to handle these products safely. The objective of this scheme is therefore the protection of workers' health and safety rather than the protection of consumers or the environment[156].

The target audience of this scheme are companies and workers in the construction sector, not consumers.

Geographical coverage

This system was founded in Germany and is well known throughout German speaking countries, including Austria and Switzerland. A one page summary of product information aimed at construction workers is provided in 15 languages but this is to assist non-German speakers working in the construction industry in Germany rather than to facilitate the uptake of the scheme in other countries[157].

Focus of the scheme (content vs. emissions)

The database contains product information on:

- threshold limit values for substances that are contained within product groups, as well as classifications for product groups;
- toxicological profile and risk assessment;
- exposure situation, based on the results of own ambient air monitoring data from work places;

[152] See http://www.bgbau.de/gisbau
[153] Berufsgenossenschaft der Bauwirtschaft
[154] See http://www.uzin.de/fachwissen/gefahrstoffverordnung/giscode/
[155] Pers. comm. 2013
[156] Ibid.
[157] Ibid.

- legal restrictions on use;
- protective measures;
- product transport, storage and disposal; and
- recommendations for substitute substances, substitute products or substitute procedures.

This information has fed into the development of the GISCODE, a coded system which summarises the health hazards of products and required protective measures. Products are sorted into comparable product groups, allowing users to identify the least hazardous products and suitable substitutes.

Products covered

Products are largely split into a few groups so that their potential health hazards and the necessary protective measures can be compared. As the scheme aims to provide comparisons, "exotic" products that do not belong to any of the main product groups cannot obtain a GISCODE[158]. GISCODE typically focuses on liquid products and pastes that are chemical substances or mixtures, such as adhesives, paints and varnishes, polyurethane and wood treatment products[159]:

- flooring installation;
- surface treatment agent for wood and parquet floors;
- paints and coatings;
- cleaning and care products;
- cold processable bitumen waterproofing products;
- epoxy coatings;
- concrete admixtures;
- methyl methacrylate coating materials;
- concrete release agents;
- polyurethane systems in construction;
- wood preservatives;
- acid protection;
- corrosion protection products; and
- cementious products.

Substances covered (incl. award criteria)

Limited information has been identified concerning the substances which are covered by criteria. However considering a large part of the information for the assessment comes from safety data sheets (SDS), it is likely that the substances covered to a large part are those subject to national legislation and European legislation (e.g. REACH).

Testing/assessment

[158] Pers. comm. 2013
[159] Ibid.

BG BAU does not carry out laboratory tests of products. Manufacturers voluntarily submit information on the product composition (including the SDS for the product) and the proposed GISCODE classification to BG BAU. Where insufficient data are provided by the manufacturer BG BAU requests additional information. Information provided by the manufacturer (alongside tests undertaken at the workplace) is used by BG BAU to determine whether the proposed classification is correct and to compile information on the most appropriate protective measures. The assessment and the resulting classification remain valid as long as the product composition and the legal framework do not change.

Manufacturers sometimes request that some aspects of their composition remain confidential.

Communicating conformity

Information is communicated in the following ways:

- GISCODEs are provided on the product's label and in their SDS;
- a 2-page summary of information about the product (including instructions on how to handle it) is provided (aimed at companies);
- a 1-page summary of the main information on the product (including instructions on how to handle it) is provided (aimed at construction workers); and
- a comprehensive database of information is provided by means of the Wingis system. This is a CD-ROM which is provided free of charge to member companies of the construction industry and for a fee to everyone interested. To a slightly reduced extend the database is available on the internet and even optimised for mobile phones[160]. It contains data similar to an SDS but in an easy to understand format on around 500 chemical substances, 400 product groups and more than 15,000 products.

Objectivity/impartiality

This scheme is run by BG BAU (with self-administration on the basis of parity between employers and employees of the construction sector) is required by law to be neutral[161].

In general, the GISCODEs have been established in cooperation between the associations of the manufacturers and the employers, trade unions and BG BAU.

[160] See http://www.wingis-online.de resp. http://www.wingismobile.de
[161] Pers. comm. 2013

Extent of use of the scheme

In total, over the 20 years of existence of this scheme, GISCODEs have been awarded to around 15,000 products (some of which however will not be construction products within the definition used in this study). For some product groups, GISCODE covers the vast majority of the market, with the large manufacturers typically using GISCODEs. In some market segments, GISCODE's coverage is thus around 70-80% of the market[162]. However, as the criteria for the different product groups were introduced at different points in time and as uptake tends to increase over time, the level of market coverage differs by product group.

Using information available on the scheme's website it has been possible to calculate that around 18% of the products under GISCODE are construction products, Table A2-36. As many of the products are paints, resins or coatings (which are not deemed construction products for the purposes of this study) the proportion is relatively low.

Table A2-36: Products certified under GISCODE[163]

Mandate Code	Mandate Type	Total no products	Types of products in scheme
M114	Cement	2	Cementitious products (2)
M119	Floorings	27	Flooring installation (27)
M124	Road construction products	7	Cold-processable bitumen waterproofing products (7)
M128	Concrete, mortar & grout	10	Concrete admixtures (3), Concrete release agents (7)
N/a	Other construction products	8	Polyurethane systems in construction (8)
N/a	Non-construction products	246	Surface treatment agent for wood and parquet floors (27), Paints and coatings (55), Cleaning and care products (68), Epoxy coatings (11), Methyl methacrylate coating materials (2), Wood preservatives (23), Acid protection (29), Corrosion protection products (31)

Milieukeur – Environment Quality Label (the Netherlands)[164]

Introduction

The Milieukeur label is a Dutch Ecolabel that is awarded to sustainable products and services. Product criteria are compiled and administered by the Stichting (SMK) [Foundation Ecolabel).

Objectives of the scheme

[162] Pers. comm. 2013
[163] See http://www.bgbau.de/gisbau/giscodes/Liste/giscodes-gesamtliste
[164] Milieukeur website, accessed at http://www.smk.nl/19/home.html

Products that comply with the scheme will typically be more durable and have a lower impact on the environment throughout their lifecycle. Thus the label promotes products and services that are more sustainable.

Geographical coverage

The label was founded in the Netherlands.

Focus of the scheme (content vs. emissions)

There are specific criteria for each product group which includes criteria for the sourcing of raw materials, the content of products and where relevant the emissions. For example:

- the coarse aggregate of concrete paving, must consist of at least 10% concrete or mixed granulate;
- the coarse aggregate concentration of concrete tiles must be at least 25%; and
- concrete paving and concrete tiles must also satisfy the requirements of the KOMO quality mark.

These measures are designed to protect the environment from gravel extraction, improve recycling and reduce the reliance on landfill sites.

Products covered

This scheme is primarily focused on consumer products and services (agricultural/food and non-food products, nursery products, fire extinguishers, green electricity etc.) only providing specific criteria for 3 construction products out of a total of 91 products and services. These being:

- safety tiles, in-situ floors and infill for AstroTurf;
- concrete products, concrete curbs (barriers), concrete paving blocks and concrete tiles (small size, large size and roof tiles); and
- linoleum flooring.

The manufacturer Granuflex is registered as a manufacturer of Safety Tiles, in situ floors and infill, which includes rubber products made from recycled tyres[165]. It should be mentioned that the manufacturer does not permit the usage of technical rubber as a raw material of rubber products. The reason has been given in a scientific assessment of the tiles by an accredited Dutch laboratory as "technical rubber (hoses, conveyor belts, etc.) have a very

[165] Granuflex® website: Rubber Products, accessed at http://www.granuflex.com/pg-23826-7-31301/pagina/about_granuflex.html

diverse composition and often contain very high levels of PAHs and volatile substances. For this reason, technical rubbers are in principle excluded as raw material for rubber tiles."[166]

Substances covered

The criteria for the product groups are established by procedures under the responsibility of the Boards of Experts, which includes representatives from producer organisations, the retail sector, government, scientists, ecologists and consumer groups. The content criteria for the products groups identified above are summarised in Table A2-37.

[166] Kempeneers Milieu en Management BV (2013): Granuflex veiligheidstegels, daktegels en Sportsfill Eco+ 0,8-2,5 mm Beoordeling milieukeurcriteria [Granuflex safety-tiles, roof-tiles and sportsfill Eco+ 0,8-2,5 mm assessment environmental criteria], accessed at http://www.granuflex.nl/content/23825/download/clnt/43630_VGM_aspecten_rubbertegels_2012_01.pdf

Table A2-37: Content criteria for construction product covered by Milieukeur			
Product group	**Relates to**	**Requirements according to DSD/CLP**	**Additional requirements**
Safety-tiles, in-situ floors and infill for AstroTurfs[167]	Rubber products used to dampen the consequences of a fall of an attraction or playground device or the prevention of injuries or the contribution to sport-technical attributes.	**Secondary rubber –granulate** Adhesives, accelerators, colourants, flame retardants must not be added which contain substances and/or preparations that have been classified according to the 'Dangerous Substances Directive and 'Dangerous Preparations Directive', such as mutagenic, teratogenic, carcinogenic, toxic, very toxic, corrosive or harmful to the environment.	**Secondary rubber –granulate** VOCs must be <0.1% in adhesives. It is not permitted to use or add the following substances during the production process: Pigments: • cadmium chloride; • cadmium oxide; • cadmium sulphate; • o-dianisidine and its salts; • o-tolidine and its salts salts; and • zinc chromate. Anti-degrading: • *N,N*'-di-ß-naphtyl-p-phenylene diamine (DNPD); contains ß-naphtylamine; • phenyl-ß-naphtylamine (PAN), if it contains more than 2 ppm ß-naphtylamine; and • phenyl-ß-naphtylamine (PBN), if it contains more than 2 ppm ß-naphtylamine. Blowing agents: • di-nitrosopentamethylenetetramine (DNPT). Retarding agents: • *N*-nitrosodiphenylamine. Accelerators: • tetramethylthiuram monosulphide (TMTM); • tetramethylthiuram disulphide (TMTD); • tetraethylthiuram disulphide (TETD); • dipentamethylenethiuram disulphide (Thiuram); • dipentamethylenethiuram tetrasulphide/ hexasulphide (DPTTS);

[167] Stichting (SMK) (2011): Certificatieschema: Veiligheidstegels, In-situ vloeren en infill voor Kunstgrasvelden [certification-scheme: Safety-tiles, In-situ floors and infill for AstroTurf's, accessed at http://www.smk.nl/Public/_NonFood_schemas/VHTINFILL101111DEF.pdf

Table A2-37: Content criteria for construction product covered by Milieukeur			
Product group	**Relates to**	**Requirements according to DSD/CLP**	**Additional requirements**
			• 2-(morpholinothio)-benzothiazole (MBS); • zinc dimethyldithiocarbamate (ZDMC); • zinc diethyldithiocarbamate (ZDEC); • zinc pentamethylenedithiocarbamate (ZPD); • copper dimethyldithiocarbamate; • bismuth dimethyldithiocarbamate (BDMC); • tellurium diethyldithiocarbamate (TDEC); • piperidine pentamethylenedithiocarbamate (PPD); and • 4,4'-Dithiodimorpholine (DTDM). Other substances: • 4,4'-methylene bis(2-chloroaniline) and its salts (MOCA). The following substances must only be used in a non-powder form: • benzenesulphonyl hydrazide (BSH); • cobalt naphthenate; • methylene diisocyanate; and • organic peroxides. In order to avoid inhalation of dangerous substances, the chemical composition of the product conforms to the threshold-limit-value of the 'decision soil-quality'. In The chemical composition of the product must conform to the threshold-limit value of the European Toy Standard EN 71 in the unlikely event that the product is ingested.
Concrete products[168]	Concrete pavement blocks and concrete	None	A minimum of 10% of the coarse supplementary material (fraction bigger than 4 mm) in the underlayment of the concrete curbs and concrete pavement blocks have to be

[168] Stichting (SMK) (2012): Certificatieschema : Betonproducten, betonbanden, betonstraatstenen en betontegels (klein format, groot format en daktegels) [certification-scheme : concrete products, concrete curbs [barriers], concrete paving blocks and concrete tiles (small format, large format and roof tiles], accessed at http://www.smk.nl/Public/_NonFood_schemas/BTP10MK58241012.pdf

Table A2-37: Content criteria for construction product covered by Milieukeur			
Product group	**Relates to**	**Requirements according to DSD/CLP**	**Additional requirements**
	curbs (barriers) and concrete tiles (small format, large format and roof tiles)		composed of concrete granulate, mixed granulate or clean burned gravel from tar asphalt concrete. A minimum of 25% of the coarse supplementary material (fraction bigger than 4 mm) in the underlayment of the concrete tiles (small format, large format and roof tiles) must be composed of concrete granulate, mixed granulate, or clean burned gravel from tar asphalt concrete. Crusher conforms to the National assessment guideline BRL Nr. 2605 or the applicant possesses documents which show that the utilised concrete granulate and mixed granulate conforms to NEN-EN 12620 and NEN 5905:2004. Clean burned gravel from tar asphalt concrete conforms with BRL No. 2502[169] and the content of PAH is a maximum of 5 mg/kg (on the basis of a method approved by AP04[170]. Concrete pavement blocks, concrete curbs and concrete tiles have to conform for the functional quality with the requirements of the KOMO-certification. The products must conform to the requirements of the BRL's (assessment guidelines):

[169] KOMO (2012): Nationale Beoordelingsrichtlijn voor het KOMO productcertificaat voor Korrel vormige Materialen met een volumieke Massa van ten minste 2000 kg/m³ voor toepassing in onder andere mortels, beton en asfalt [National assessment guideline for the KOMO product-certificate for granulate materials with a volume mass of at least 2000 kg/m³ for the application, amongst others, in mortars, concrete and asphalt], information downloaded from http://beheer.komo.nl/brl/BRL%202502.pdf

[170] The Accreditation Programme Building Materials (AP04) establishes implementing requirements for laboratory analysis for samples of batches of soil, building materials and granular waste, for research in the context of the Soil Quality Decree. This includes research that was previously performed under the regime of the 'construction products decision' (Bouwstoffenbesluit). AP04 has been updated on the first of October 2008 in order to match the new regulations under the Soil Quality Decree." [translated from the Dutch original text], information downloaded from the OMEGAM laboratoria (Standard analyses: AP04): (http://www.omegam.nl/omegam/content2.nsf/0/Homepage.html?open&cat2=homepage&right=861D658C8565FB99C125742B00512E3A)

Table A2-37: Content criteria for construction product covered by Milieukeur			
Product group	**Relates to**	**Requirements according to DSD/CLP**	**Additional requirements**
			• concrete pavement blocks: BRL 2312; • concrete curbs/barriers: BRL 2314; • concrete tiles (small/large format): BRL 2313; and • concrete tiles (roof): BRL 2315.
Linoleum[171]		The product must not contain substances or preparations that have been classified (according to EC-Directive 1967/548/EC and 1999/45/EC and revisions of Regulation (EC) Nr. 1272/2008 as: • carcinogenic (R40, R45, R49 or H351, H350, H350i); • mutagenic (R46, R68 or H340, H341); and • reprotoxic (R60, R61, R62, R63 or H360 or 361 alone or in combination with one or more of the letters d, f, D and F). The total quantity of substances classified (according to EC Directive 67/548/EC, 1999/45/EC and revisions of Regulation (EC) Nr. 1272/2008) as environmentally	The following heavy metals will not be added actively to the product (trace elements may occur): • lead; • cadmium; • mercury; and • (total) chromium (Cr III and Cr VI). Emission of VOC is limited to <2g/m^2

[171] Stichting Milieukeur (SMK) (2012): Certificatieschema Milieukeur: Linoleum [certification scheme Milieukeur: Linoleum], information downloaded from http://www.smk.nl/Public/Milieukeur_NonFood_schemas/LIN9MK41DEFschema6december2012.pdf

Table A2-37: Content criteria for construction product covered by Milieukeur			
Product group	**Relates to**	**Requirements according to DSD/CLP**	**Additional requirements**
		harmful (R50, R50/53, R51/53, R52/53, R52, R53, R54, R55, R56, R58, R59 or H400, H410, H411, H412, H413, EUH059), must not be [present in the product] higher than 2 per cent in weight of the product. The total quantity of every individual substance must not be more than 1% (more or less) of the product.	

Testing/assessment

The procedure can vary depending on the type of product requiring certification; however the basic steps are the same. Unfortunately it has not been possible to access the testing and assessment methodology used by Milieukeur. Manufacturers are advised to check whether criteria exist for the product or in some cases services, if not they are referred to the European Ecolabel.

Communicating conformity

Label is affixed to product.

Objectivity/impartiality

The scheme is approved by the Accreditation Council, which shows that they are expert, reliable and impartial and operates in accordance with the European standards for product certification (EN 45011). Milieukeur has an agreed licensing agreement with independent certificate institutes which carry out certification.

Extent of use of the scheme

As of July 2013, there are 575 businesses which have a certified product under the Milieukeur scheme[172]. Of these there are 15 companies which possess a certificate for concrete products, 1 which is certified for linoleum products and also 1 which has the certificate for safety tiles, in-situ floors and infill, equating to 3%. In total there are 21 precast concrete products, 19 flooring products and 3 roofing products. It has not been possible to calculate the proportion of certified products which are construction products, however given the small share of the registered businesses; it can be assumed this is also insignificant.

Natureplus

Introduction

Natureplus is a voluntary label awarded by the International Association for Sustainable Building and Living (Natureplus). The objective of this association is to promote sustainable development within the building and construction sector[173].

[172] Milieukeur website: The Dutch environmental quality label , accessed at http://translate.google.co.uk/translate?hl=en&sl=nl&u=http://www.smk.nl/19/home.html&prev=/search%3Fq%3Dhttp://www.smk.nl/19/home.html%26client%3Dfirefox-a%26hs%3DfCO%26rls%3Dorg.mozilla:en-US:official

[173] Natureplus website: natureplus, http://www.natureplus.org/en/natureplus/

Objectives of the scheme

The aim of the Natureplus label is to promote the use of those building and accommodation products which incorporate high levels of sustainability, in both economic and social terms. The Natureplus Seal of Quality is awarded to products which have satisfied requirements in relation to health, environmental impacts and suitability for purpose[174].

The Natureplus label is aimed at professionals rather than consumers who do not appreciate the stringent criteria certified product must meet. Natureplus is a relatively small organisation and does not have the means to advertise the label and instead uses building professionals.

Geographical coverage

This is an international scheme. The Natureplus association has offices or contact points in Austria, Belgium, France, Germany, Hungary, Italy, Lithuania, the Netherlands, Switzerland and in the UK[175]. It is strongest in Germany, Austria (where it has been used in public procurement) and Switzerland, but has a reasonable market presence in most of Western Europe. Interestingly, UK Natureplus has been trying to establish itself for 2 years. However, it has to date not certified any products in the UK.

Focus of the scheme (content vs. emissions)

This scheme considers both the content as well as emissions from the product in question. There is a list of substances that are not allowed to be used in certified products as well as stipulations regarding emissions of certain substances[176]. Content criteria have been historically used prior to emission tests and emission standards. Natureplus continue to use both content and emission tests to ensure conforming products meet the relevant sustainability requirements[177].

Products covered

The Natureplus label is awarded to building and accommodation related products. Products covered include[178]:

- components;
- floor coverings;
- roof slates and tiles;
- insulation (from renewable materials, mineral-based and composite insulation systems);
- timber and wood materials;
- adhesives and sealants;

[174] Natureplus website: natureplus, http://www.natureplus.org/en/natureplus/
[175] Natureplus website: International Contacts, http://www.natureplus.org/en/subnavigation/contact/
[176] See http://www.natureplus.org/uploads/tx_usernatureplus/RL0000BasicCriteria2011.pdf
[177] Pers. Comm. 2013
[178] Natureplus website: Products, http://www.natureplus.org/en/products/

- masonry elements;
- mortar and plaster renders and adhesives; and
- dry-wall construction boards.

Substances covered (including award criteria)

Before a product is certified with the Natureplus quality seal, it must first satisfy the following basic criteria and depending on the product group, they may also be subject to product-specific requirements. The strict requirements mean that in reality, only 20% of products from a particular category are awarded the quality seal[179]. Detailed guidelines to meet these criteria have been produced by Natureplus and are explored below[180].

Suitability of Application

Products must have a valid technical approval where applicable and comply with the minimum standards laid down in the relevant national or European legislation/technical standards. If there are no relevant standards the products functional suitability must be proven. A product must also pass a quality assurance system; with the product needing to display it will have a reasonable and useful life and not have excessive maintenance costs.

Composition, forbidden substances and substance restrictions

The manufacturer is required to declare all input materials and submit a current safety data sheet as per the REACH Regulations. If intermediate/preliminary products or formulations are used as input substances, substances that contain or have been used with these must be declared if they exist in the final product in proportions greater than 0.1%.

As the scheme encourages sustainability, manufacturers must also show sustainable use of natural resources and keep the synthetic content at the lowest possible level which will not compromise the quality and functionality of the product. Products must also contain at least 85% of materials from renewable raw materials or mineral based materials which are almost unlimited in their availability.

The scheme provides two prohibited substances lists which must not be used in certified products. The first list is a general list, which covers substances that have been prohibited or classified as carcinogenic, mutagenic or toxic to reproduction under DSD/DPD, the CLP and national law or by named institutions (see below). These substances are only permitted in products if accompanied by a comprehensive scientific evaluation report which justifies the use of the substance.

General List of Prohibited Products

The general list of prohibited substances includes those listed under the following:

[179] Natureplus website: Criteria, http://www.natureplus.org/en/natureplus/criteria/criteria/

[180] Natureplus (2011): Award Guideline RL0000 – Basic Criteria, accessed at http://www.natureplus.org/uploads/tx_usernatureplus/RL0000BasicCriteria2011.pdf

- prohibited substances as per CLP-Regulations, DSD 67/548/EEC or national law (e.g. GefStoffVO, TRGS 905 (German standards));
- CLP-Regulations: Carcinogenic Cat. 1A and 1B. Mutagenic Cat. 1A and 1B, Toxic to reproduction Cat. 1A and 1B;
- substances as per DSD 67/548/EEC C1 and C2, M1 and M2, R1 and R2 and as per national law (e.g. TRGS 905);
- substances as per MAK-lists III1 and III2 (German occupational exposure limits);
- substances in IARC groups 1 and 2a (International Agency for Research on Cancer); and
- substances requiring official approval as per Appendix XIV of the REACH regulations.

The general list of prohibited substances also includes the following:

- POPS: Aldrin, Dieldrin, DDT, Endrin, Heptachlor, Chlordan, HCB, Mirex, Toxaphen, PCB, Dioxine und Furane;
- arsenic and arsenic compounds;
- lead and lead compounds;
- cadmium and cadmium compounds;
- organotin compounds;
- antimony;
- hydro-fluorocarbons (HFC); and
- organic halogen phosphates.

Special List of Prohibited Products

In addition to the general list, there is also the special list of prohibited substances. These are substances which, according to CLP, DSD, national law, or named institutions are suspected of being carcinogenic, mutagenic or toxic to reproduction, toxic or sensitising or classified as harmful to the environment, Table A2-38. This includes all input substances as well as substances in intermediate/preliminary products or formulations that have been classified with the following hazard statements.

Specific requirements

Depending on the product group, there may also be a requirement to meet additional specific criteria. These have been reviewed and the content and emissions criteria summarised in Table A2-39.

Table A2-38: Special list of prohibited substances			
Substances classified under CLP	**Substances contained in the following lists**	**Other named substances and compounds**	**Nano-materials**
Acute Toxicity: H300; H310, H330 Specific Target Organ Toxicity: H370, H304, H372, H373 Toxic: H301, H311, H331 Sensitisation of the skin and respiratory tract: H334, H317 Sensitisation of the skin and respiratory tract: H334, H317 Carcinogenic: H351 Germ cell mutagenicity: H341 Toxic for reproduction: H361, H362 Hazardous to the aquatic environment – Acute Hazard: H400 Hazardous to aquatic environment – Chronic Hazard: H410, H411 Hazardous to the ozone layer: EU H059	Substances as per DSD 67/548/EEC C3 M3, R3 and as per national law (e.g. TRGS 905 K3) Substances listed in Candidate list (SVHC) – ECHA Substances as per MAK-lists III3 (German occupational exposure limits) Sensitizing substances as per MAK IV, BgVV-List Cat. A, TRGS 907 or the applicable national law (BgVV = German Federal Office for Consumer Health Protection)	Organic halogen compounds Pyrethroids Phthalic acid ester (except polyethylene terephthalate (PET)) Substances classified as Water Hazard Class 3 (German standard)	Synthetic nano-materials that are between 1 – 100nm may only be employed if: 1) An evaluation of the advantages has been undertaken which proves the benefits/reduction in environmental impact by additional nano-materials; 2) The safe use of the product (environment and human risk) over the whole life cycle of the product is demonstrated; and 3) All nano-materials within the product must be declared.

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
Insulation materials from renewable raw materials	Hemp, flax, sheep's wool, wood fibre board, wood –fibre (blown-in and loose-fill), cellulose fibre board, cellulose fibre (blown-in), insulation from wood chips/shavings (blown-in and loose-fill), cotton, coconut fibre, straw and reed, rye granulate (blown-in and loose-fill) and cork	**Hemp** • fire retardants must not exceed 15% of dry weight; • use of boron compounds as fire retardants/biocides is prohibited; and • use of halogen-organic compounds is prohibited. **Flax** • as hemp **Sheep's wool** • use of halogen-organic compounds is prohibited. **Wood fibre** • bitumen is not permitted as a raw material; • halogen-organic compounds are not permitted as flame retardants' and • use of boron compounds as fire retardants/biocides is prohibited. **Cellulose** • use of boron compounds as fire retardants/biocides is prohibited; and • use of halogen-organic compounds is prohibited. **Recycled paper** • as cellulose **Cellulose-based** • use of halogen-organic compounds is prohibited. **Woodchips and wood shavings** • use of additives such as fibres, synthetic-organic wood or fire retardants and other halogen-organic compounds is not permitted. **Rye granulate**	Content limits for: • halogen-organic; compounds • polyester fibres; • PAH; • metals and metalloids; and • pesticides.	Emission limits for: • VOC; • Formaldehyde; • Acetaldehyde; and • isocyanate monomers.

[181] Natureplus website: Basic Criteria, accessed at http://www.natureplus.org/en/natureplus/issuance-guidelines/

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
		• use of boron compounds as fire retardants and/or biocides is prohibited; and • use of additives such as fibres, synthetic-organic wood or fire retardants and other halogen-organic compounds is not permitted. **Cork** • biocides and fire retardant additives are prohibited.		
Timber and wood materials	Porous wood fibre boards, chip and particle board, OSB boards, plywood and block0board sheets, adhesive bonded wood products, chip and particle board for furniture, MDF boards, HDF boards, wood and wood based flooring, untreated solid timber and adhesive bonded wood products.	Use of wood preservatives, halogen-organic compounds and synthetic-organic fire retardants is prohibited. **Porous wood fibre board** • use of boron compounds as fire retardants and/or biocides is prohibited; and • the use of additives such as synthetic-organic biocides and fire retardants and other halogen-organic compounds is not permitted. **Chipboard and particle board** • pure UF compounds (urea-formaldehyde) are not permitted. **OSB** • pure UF compounds (urea-formaldehyde) are not permitted; and • use of boron compounds as fire retardants and/or biocides is prohibited. **Plywood boards** • the product and all pre-fabricated products must not contain any chemical-synthetic flame retardants or biocides and no halogen-organic compounds. **Adhesive-bonded wood products** • polyurethane/polyuria adhesives based on isocyanates and pure UF compounds as well as mixed resins based on	Content limits for: • halogen-organic; compounds • metals and metalloids; • PAH; and • pesticides.	Emission limits for: • VOC; • Formaldehyde; • Acetaldehyde; and • isocyanate monomers.

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
		aminoplasts and phenol are not permitted. **Laminated wood-based boards** • surface sealants must not contain any halogen-organic compounds or metal compounds. **MDF boards** • the product and all pre-fabricated/preliminary products must not contain any chemical-synthetic flame retardants or biocides and no halogen-organic compounds. **Hard and medium wood-fibre boards** • as MDF boards. **Wood and wood based flooring** • surface sealants must not contain any halogen-organic compounds or metal compounds. **Untreated solid timber** • must not contain any adhesives or be subjected to other chemical treatments. **Timber façade** • UF-compounds are not permitted • the surface coating materials must not contain any halogen-organic compounds or metal compounds • all solvents must be free from aromatics (≤0.1%). The product, including all preliminary/intermediate products must not contain any wood preservatives, flame retardants, biocides or halogen-organic compounds.		
External thermal insulation composite systems	External thermal insulation composite systems employing, cork insulating boards, wood fibre insulating boards, hemp insulating	Must contain a Natureplus certified insulation board.	Content limits for: • metals and metalloids; • formaldehyde; • AOX; and • TVOC.	

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
	boards, reed insulating boards, and mineral foam insulating boards.			
Insulation materials from expanded or foamed mineral raw materials	Natural stone based insulation (blown-in or loose-fill), expanded clay insulation (loose-fill), mineral based foam insulation boards for internal use, mineral based foam insulation boards for external use, foam glass insulation boards and foam glass granulate.	The use of polyurethane and halogen-organic substances is forbidden. **Cellular glass insulation boards** • plastics (e.g. PVC) may not be used as lamination materials.	Content limits for: • metals and metalloids; • PAH; • harmful organic compounds (AOX, TOC); and • radioactivity.	Emission limits for: • VOC; • Formaldehyde; and • acetaldehyde.
Roof slates and tiles	Ceramic roof tiles, concrete roof tiles, fibre-cement roofing products and natural stones roof coverings.		Content limits for: • metals and metalloids; • eluate analysis; • PAH; • organic compounds (AOX); and • radioactivity.	
Mortar and plaster, renders and mineral based adhesives	Plaster and mortar for internal applications, gypsum render and render	The following additives are not permitted: • glycol ethers and esters; • APEOs; • halogenated isothiazolinone; and	Content limits for: • metals and metalloids; • eluate analysis;	Emission limits for: • VOC; • formaldehyde; and

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
	containing gypsum for internal applications, loam/clay mortar, stabilised loam/clay mortar, renders for external applications, renders for external thermal insulation composite systems, lime and cement based renders ad mineral based adhesives and fillers.	• formaldehyde decomposition agents. Only pigments from iron oxide or inorganic substances with a comparable or lower level of toxicity are permitted. **Plaster/mortar for internal use** • biocides and halogen-organic compounds are prohibited; and • VOCs are restricted to 100ppm. **Loam/clay mortar**, the following are not permitted: • biocides; • halogen-organic compounds; • synthetic materials and fibres; • lime, gypsum and cement as binding agents; and • cellulose and carbohydrate derivatives. **Renders for external use**, the following are not permitted: • biocides; and • halogen-organic compounds. **Insulating plaster/render:** • the use of biocides and halogen-organic compounds is prohibited. **Mineral-based adhesive and filler/render/plaster coating:** • use of biocides and halogen-organic compounds is prohibited.	• organic compounds (AOX, PAH, phenol index, TOC); • pesticides • pH value; • asbestos fibres; and • radioactivity.	• acetaldehyde.
Adhesives from renewable raw materials	Dispersion adhesives from renewable raw materials, wallpaper paste/adhesives from renewable raw materials and paper and wood glues from	Must not contain: • preservatives which have not been approved for use as a food additives or for cosmetics; • halogen-organic compounds; • tin organic compounds; • phthalates;	Content limits for: • halogen-organic compounds; • organic compounds; • asbestos fibres;	Emission limits for: • VOC; • formaldehyde; and • acetaldehyde.

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
	renewable resources	• APEOs; and • formaldehyde or agents which are capable of decomposing formaldehyde. **Dispersion adhesives**: • additives containing cobalt siccatives are not permitted. **Paper and wood glues**: • diisocyanates and organic tin compounds are not permitted.	• metals and metalloids; and • pesticides.	
Dry wall/dry lining construction boards	Gypsum-bonded fibreboards, gypsum plaster boards, gypsum-bonded particle boards, gypsum wall blocks, cement-bonded particle boards, clay boards and mineral-bonded wood wool boards	Fungicides and halogen-organic compounds are prohibited Hydrophobic substances must not contain organic solvents or emollients. **Gypsum boards:** • must not contain halogenated isothiazolinones; and • the use of nano-materials is not permitted unless tests show there is no risk to human health or the environment. **Cementious chipboards**: • biocides and halogenated organic substances are not permitted. **Clay boards**: • biocides, halogen-organic compounds and synthetic materials and fibres are not permitted in clay mortar. **Mineral-bonded wood wool boards**: • biocides and halogen-organic substances are not permitted in.	Content limits for: • metals and metalloids; • organic compounds; • pesticides; and • radioactivity.	Emission limits for: • VOC; • Formaldehyde; and • acetaldehyde.
Masonry elements – blocks, bricks and	Clay bricks, vertically perforated bricks, lime-sand bricks,	Vertically perforated bricks Porous concrete blocks:	Content limits for: • metals and metalloids;	Emission limits for: • VOC; • formaldehyde;

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
jacket blocks	hollow and solid bricks and blocks, porous concrete blocks and elements, cellular concrete blocks and woodchip-concrete jacket blocks.	• biocides and halogen-organic substances are not permitted. Woodchip jacket blocks and boards: • halogen-organic substances are not permitted in.	• eluate analysis; • radioactivity; and • AOX	and • acetaldehyde.
Flexible floor coverings	Linoleum and fibre-board backed linoleum floor coverings	**Linoleum**, the following are not permitted: • Arsenic, lead, cadmium or mercury compounds; • halogen-organic substances; and • colourants that might release carcinogenic aryl amines. Surface-coating materials must be free of aromatics and tensides based on alkylphenol ethoxylates. **Fibre-board backed linoleum**, the following additives are prohibited: • glycol ethers and esters; • APEOs • formaldehyde separators/dispersers; and • halogenated isothiazolinones. The product must also not contain chemical-synthetic flame retardants, biocides or halogen-organic compounds.	Content limits for: • EOX; • colourants; • metals and metalloids; and • pesticides.	Emission limits for: • VOC; • formaldehyde; • acetaldehyde; and • monomer isocyanates (fibre-backed only)
Mineral-based wall and floor coverings	Ceramic wall and floor coverings and natural stone paving			
Textile floor coverings	Textile floor coverings	Halogen-organic compounds are not permitted. Addition of synthetic-organic flame retardants is prohibited. Use of moth proofing agents and antimicrobial additives is	Content limits for: • AOX; • Metals and metalloids; • Formaldehyde;	Emission limits for: • VOC; • formaldehyde; • acetaldehyde; • carbon

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
		prohibited. Use of azo dyes/colourants which are capable of decomposing carcinogenic amines and dispersion emulsion paints suspected of being carcinogenic or of causing allergic reaction is prohibited.	• pH • amines (azo pigments); • dispersion colourants; • flame retardant and proofing agents; • pesticides; • pentachlorophenol; • natural rubber latex; • filler materials; and • foreign fibres.	disulphide; and • nitrosamines.
Timber framed windows	Timber framed windows			
Wooden doors	Interior doors made from wood and wood-based materials, wooden house-entrance doors and special doors.	The use of wood preservatives, halogen-organic compounds and synthetic-organic fire retardants is prohibited. **Interior doors:** • surface coating materials must not contain any halogen-organic compounds or metal compounds which are categorised under No 2.6 of the Basic Criteria; and • all solvents must be free of aromatics.	Content limits for: • AOX; • metals and metalloids; and • pesticides.	Emission limits for: • VOC; • formaldehyde; • acetaldehyde; and • monomer isocyanate.
Sealant sheeting from renewable raw materials	Draft exclusion and vapour-barrier sheeting from renewable raw materials and paper	Proportion of adhesives should be kept to a minimum and polyurethane/polyuria adhesives based upon isocyanates are not permitted. Fire retardants must be halogen-free and not exhibit any herbicide	Content limits for: • halogen-organic compounds; • AOX;	Emission limits for: • VOC; • formaldehyde; and

Table A2-39: Specific content criteria: insulation materials from renewable raw materials [181]				
Product group	**Materials covered**	**Composition, forbidden substances and substance restrictions**	**Content limits**	**Emission limits**
	underlay sheeting from renewable raw materials for loose-fill insulation.	effects. Strengthening layer of fibre-glass sheeting must not contain any organic chlorine compounds. Products and all pre-fabricated products must not contain any wood preservatives, halogen organic compounds, synthetic colourants, formaldehyde or agents which are decomposing formaldehyde.	• metals and metalloids; • pesticides; • organic compounds	• acetaldehyde.
Wall coverings wallpaper	Paper wall coverings, textile wall coverings, fleece wall coverings, wall coverings from natural materials and fluid wall coverings (cotton-based render).	The following additives are prohibited: • halogen-organic compounds; • synthetic-organic fire retardants; • antimicrobial additives; • azo dyes/colourants which are capable of decomposing carcinogenic amines; and • dispersion colourants which are carcinogenic or cause allergic reactions. **Paper wall coverings**, Colour pigments which are classified as environmentally dangerous, carcinogenic, mutagenic or detrimentally affecting fertility are not permitted. **Textile wall coverings**: • the addition of synthetic-organic flame retardants and proofing agents is not permitted; • subsequent spray-treatments with flame retardants are not permitted; and • Air-impermeable laminations (e.g. polyethylene laminates) are prohibited.	Content limits for: • AOX; • metals and metalloids; • pesticides; • glyoxal; • dispersion pigments/colourants (textile only); • foreign fibres (textile only); • asbestos fibres (textile only); and • amines (azo pigments).	Emission limits for: • VOC; • formaldehyde; and • acetaldehyde.

Declaration
Following on from the previous requirement, manufacturers are required to provide a full list of all input substances in declining quantity, on the product packaging or if not possible on an accompanying technical datasheet or sales leaflet. Information concerning processing and installation must also be included (see below).

Raw material sourcing, production of preliminary products, production
Linked to the ethos of the scheme, the Natureplus quality seal demands products have an above average ecological performance. More specifically, the acquisition of the raw materials must be sustainable and not environmentally damaging and the production process is energy efficient. As means of verification, Natureplus carry out a product LCA (which is later transformed into an EPD) which compares the number of environmental impact indicators to the average scale of this kind of production.

We work out a product LCA (ready to transform into an EPD) and

Product packaging
Manufacturers should endeavour to use packaging with has the lowest possible environmental impact. This includes the use of reusable packaging, avoiding plastics containing plasticisers, opting for recycled card, paper and wood or avoiding materials containing biocides.

Processing/installation
Manufacturers must comply with the European and national health and safety regulations. To facilitate health and safety, manufacturers should also include the following information on the accompanying product declaration:

- usage area;
- processing, maintenance and care instructions;
- associated hazards and any necessary protective measures;
- disposal instructions; and
- warnings about any risk of allergic reactions.

Usage
All products must comply with the EU Construction Products Regulations with respect to hygiene, health and environmental protection. Natureplus also sets more stringent requirements on emission levels into the indoor air during the usage phase. Criteria are set for Volatile Organic Compounds, odours, radioactivity and dust particles and fibres.

Recycling/disposal
Manufactures must show that all efforts have been made to ensure that the product can be recycled at the end of its useful life. At the very least products must not be deemed as hazardous waste and be suitable for disposal by landfill or Energy from Waste. A few of the recommendations by Natureplus include keeping inputs to a minimum, opting for easily

recyclable material and avoiding composite materials but where they are used they should be labelled and removable.

Testing/assessment

The assessment process usually involves visiting production sites to take samples and subsequently completing laboratory tests to ensure the basic and product-specific requirements have been met. Products awarded the Natureplus quality seal are certified for three years, with tests to ensure continued compliance after year one and two. In year three the compliance test is more detailed and similar to the initial testing procedure.

The issue of recycling is covered in the basic award criteria, more specifically in the sourcing of raw materials, both for the product and packaging and also the inherent recyclability of the finished product.

The basic criteria also stipulate that manufacturers must consider the health and safety of workers involved in processing and installation of the product. If all requirements have been met, the product will possess no inherent risks and there should be no requirement for personal protective equipment[182].

The average costs of certification is €6,000 - €7,000 per product (independent testing fees of laboratories), however there can be economies of scale if a manufacturer wants to certify more than one product.

Communicating conformity

Conformity is communicated by means of a label.

Objectivity/impartiality

The assessment is based on a manufacturer declaration, with all inspections and tests being performed by independent, accredited laboratories, following the requested norms e.g. ISO EN 16000 for emission chamber tests and EN norms for laboratory testing.

Extent of use of the scheme

There are currently around 60 manufacturers with products certified by Natureplus with a total of 200 products certified under this scheme, with some 92% being defined as construction products for the purpose of this study, Table A2-40. Turnover for all Natureplus certified products is around €500 million across Europe, licence fee revenue is about €250,000 and the product certification revenue is at about €150,000 per year, most of which goes to the independent laboratories and auditors for their expertise.

[182] IBO (2011): Environmental and health related criteria for buildings, accessed at http://www.anec.eu/attachments/ANEC-R&T-2011-ENV-001final.pdf

Table A2-40: Certified products under Natureplus[183]			
Mandate	**Type**	**Number of products**	**Products in scheme**
M101	Doors, windows	10	Windows (5), Doors (5)
M103	Thermal insulating products	60	Hemp (1), Wood shavings (1), Wood Fibres (47), Sheep's wool (1), Cellulose (1), Natural-stone based insulation (3), Mineral-based foam boards (1), Foam glass insulation (5)
M106	Gypsum	1	Dry-wall construction boards (1)
M112	Structural timber products and ancillaries	11	Solid timber (11)
M113	Wood based panels	14	Wood-fibre boards (14)
M116	Masonry	29	Vertically perforated brick/blocks (22), Porous concrete blocks and elements (5), Woodchip-concrete jacket blocks (2)
M119	Floorings	10	Wood and parquet flooring (6), Linoleum (4)
M122	Roof coverings	25	Roof tiles (3), Roof slates (22)
M128	Concrete, mortar & grout	40	Mortar and plaster renders and adhesives (40)
M/489	External Thermal Insulation Composite Systems	5	ETICS - composite insulation systems (5)
000	Non-construction products	17	Mineral-based paints (17)

NF Environment Mark (France)

Introduction

Created in 1991, the NF Environment mark is awarded to products that have a reduced effect on the environment while offering an equivalent performance. The scheme is administered by AFNOR and is run by the Environmental Labelling Committee, who is responsible for developing product group criteria[184].

Objectives of the scheme

The NF Environment mark is intended to certify, throughout their life cycle, that products or services to which it is applied have a lower impact on the environment than other products or services on the market, maintaining the use quality required.

[183] Natureplus website: Products, accessed at http://www.natureplus.org/en/products/

[184] Okocimeke website: The NF-Environment Mark eco-labelling system of France, accessed at http://okocimke.kvvm.hu/public_eng/?ppid=2420000&pid=1000167&pprint=1

Geographical coverage

This is a national scheme used in France.

Focus of the scheme (content vs. emissions)

Products are complaint with the safety and/or quality characteristics defined in the corresponding certification reference system, which encompass French, European and international standards as well as additional specifications relating to the product[185]. As a general rule the NF mark standards exceed current standards (CE-Mark) with additional quality criteria that meet consumers' needs[186].

Products covered

The product groups under this scheme are mostly consumer products, such as furniture, laser print cartridges, composters, stationery, and cleaning products, with the exception of adhesives for flooring.

Substances covered (including award criteria)

The chemical content criteria for adhesives for flooring are summarised below, Table A2-41.

Table A2-41: Chemical content criteria for NF Environment[187]

Product group	Relates to	Ecological criteria	Additional requirements regarding raw materials
Adhesives for flooring	Adhesives for textile floor coverings, plastic tiles and plastic coating strips	VOC: content must be less than 30g per litre of water produced (these must be specified)	Hazardous substances are permissible in permitted quantities

Testing/assessment

[185] NF Mark website: Manufacturers or service providers, accessed at http://www.marque-nf.com/pages.asp?ref=professionnels_fabricants&Lang=English

[186] Ecosafene website: Certification, accessed at http://www.ecosafene.com/EN/service/certification.html

[187] Ecolabels.fr website: Categories certified products or services, access at http://translate.google.co.uk/translate?hl=en&sl=fr&u=http://www.ecolabels.fr/fr/recherche-avancee/categories-de-produits-ou-services-certifies&prev=/search%3Fq%3Dhttp://www.ecolabels.fr/fr/recherche-avancee/categories-de-produits-ou-services-certifies%26biw%3D946%26bih%3D893

The NF Environment certifies the conformity of products and/or services to the requirements specified in the standards of certification. For each category of goods or services is a standard.

Although it refers to standards, including specifications for suitability for use, the NF Environment is not a standard. Its specificity is to consider the environmental impacts throughout the life cycle of products, that is to say, to incorporate criteria that go beyond the scope of the technical specifications on the standards.

Communicating conformity

Certified products can display the NF Environment label.

Objectivity/impartiality

Conformity with NF Environment Mark's standard is verified by an independent organisation (third party) following ISO 17011 Accreditation. The NF Network is a group of competent and impartial organisations that AFNOR Certification calls on to issue the NF Mark. The organisations meet standards NF EN 45011 or NF EN ISO/CEI 17025. AFNOR Certification and the NF Network are accredited by COFRAC. AFNOR Certification ensures the consistency and manages the Network as a whole.

Extent of use of the scheme

Whilst this scheme has the potential to cover adhesives for flooring, there are no products currently listed under this category on the company's website.

Nordic Swan (Denmark, Finland, Sweden, Iceland, Norway)

Introduction

The Nordic Swan, named after the label's logo is a voluntary eco-labelling scheme that evaluates a product's impact on the environment throughout the whole lifecycle.

Objectives of the scheme

Established in 1989 by the Nordic Council of Minister, the Nordic Swan was introduced with the purpose of providing an environmental labelling scheme that would contribute to sustainable consumption.

Geographical coverage

The Nordic Swan is the official Ecolabel of the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden). Each Nordic country has national offices which are responsible for criteria development, licensing, marketing and audits. Companies based in countries outside of the Nordic region can also apply for the label; in fact many do, including companies from Italy seeking to distinguish their products from competitors in Europe. However in this instance no marketing support is provided.

Focus of the scheme (content vs. emissions)

Products carrying the Nordic Ecolabel meet environmental and often climate requirements. The lifecycle of the product is analysed, i.e. the product's impact on the environment from raw material sourcing to the final end disposal. Criteria are also set with regard to quality, health aspects and performance/functionality.

Products covered

The Nordic Swan scheme covers a range of products and services, some of which are construction products. There are 62 product standards/criteria that cover some 200 – 300 product groups. There are around 2,200 licenses that cover some 6 – 8,000 products[188]. Product standards criteria include:

- floor coverings;
- chemical building products;
- durable wood alternative to conventionally impregnated wood;
- heat pumps;
- panels for the building, decorating and furniture industry;
- small houses, apartment buildings and pre-school buildings;
- stoves;
- solid biofuel boilers;
- windows and exterior doors; and
- consumer goods/ location based services.

Although recent estimates for market share were unavailable, Nordic Swan estimates that they covered 30-40% of the market for wooden building products and decorating panels a few years ago, with less success with chemicals.

The scheme also certifies whole buildings including residential housing and pre-schools. For these buildings in Nordic countries, compared to similar schemes such as the BREEAM, the Nordic Swan is applied far more frequently.

Substances covered (including award criteria)

[188] Pers. Comm. 2013

The Nordic Swan recognises that one of the most important issues for the environment is the number of uncontrolled chemicals in products. The Nordic Swan is based on ISO 14024 and it is therefore natural that it will take into consideration the content of eco-labelled products.

At present, there are 62 sets of criteria; these may cover a single product group or several. Each of the construction product group criteria are considered in turn below.

Chemical Building Products[189]

Chemical building products are considered to be liquid or unhardened products that are used within internal and external building works, on a range of substrates. This includes construction products such as adhesives, sealants and fillers.

The award of the label takes into account the impacts of the product throughout its lifecycle. It therefore takes into account the raw materials used, method of production, how the product will be used, its performance throughout its lifecycle and the waste it produces after use.

Chemical Building Products: General Content Requirements

Table A2-42 overleaf outlines those chemical substances that are prohibited from all chemical building products. For the purposes of the Nordic Ecolabel, ingoing substances are any substances that remain in the product that are not pollutants from raw material production. Pollutants are considered to be trace elements from raw production that exist in the finished product in concentrations of less 100 ppm (0.01 weight %, 100 mg/kg). However, the definition of pollutants does not include substances that have purposefully been added to a raw material.

[189] Nordic Swan website, Product criteria, accessed: http://www.nordic-ecolabel.org/Templates/Pages/CriteriaPages/CriteriaGetFile.aspx?fileID=147236001

Table A2-42: Ingoing chemical substances not permitted in chemical construction products							
Ingoing chemical substance, general requirement	**Ingoing chemical substance R-Phrase**	**Preservatives**	**Monomers**	**Heavy metals**	**Titanium dioxide**	**Nano-particles**	**Banned substances**
Substances that are, or may release substances that are classified as carcinogenic, mutagenic or toxic for reproduction. However, formaldehyde is permitted in products provided the concentration requirements are complied with.	R23, R24, R25, R26, R27, R28, R33, R39, R42, R48, R49, R68. Exempted from this requirement are preservatives, provided they do not have any of the following R – phrases: R33, R42, R49, R68 Substances classified as N R50/53, N R51/53 and R52/53 must comply with threshold requirements.	Preservatives within the product should not be bio-accumulative, as defined in OECD test methods 107, 117 or 305. Threshold concentration limits for isothiazoline, Iodopropynyl butylcarbamate, 5-chloro-2-met -hyl-2H-isothiazol-3-one and dimethyl-2H-isothiazol-3-one must be met.	A new polymer may only contain polymers that comprise a maximum of 100 ppm residual monomers that are classified as very toxic, toxic or harmful.	The product, or ingoing chemical substances, must not contain heavy metals or compounds of heavy metals (cadmium, lead, chromium VI, mercury, arsenic, barium (not barium sulphate), selenium and antimony). Trace quantities of heavy metal must not exceed 100 ppm (100 mg/kg, 0.01 weight %).	If titanium dioxide comprises more than 3.0 weight % of the product, emissions from the production of titanium dioxide must be met.	Nano metals, nano carbon compounds and/or nano fluoride compounds may only intentionally be added to chemical building products if it is shown that it will not present problems in terms of health or the environment.	PBT organic compounds; vPvB organic compounds; Organotin compounds; Phthalates; Substances that release alkylphenols during degradation; Haologenated organic compounds (with the exception of preservatives which must meet stated requirements); Iscocyanates; Naphtha classified as very toxic, toxic or harmful to health; Bisphenol-A-compounds; and Fragrance

Table A2-43 below lists specific content requirements for chemical building products.

Table A2-43: Specific content requirements for chemical products		
Adhesives	**Sealant**	**Filler**
Volatile aromatic compounds should not intentionally be added to the product, but may exist as traces or pollutants provided quantities do not exceed 100 ppm (0.01 weight %, 100 mg / kg). However, adhesives designed to resist winter conditions and wallpaper paste may contain VOC in higher concentrations. Of course, any applicable VOC emissions must still be met.	Volatile aromatic compounds should not intentionally be added to the product, but may exist as traces or pollutants provided quantities do not exceed 100 ppm (0.01 weight %, 100 mg / kg). Sealants may be comprised up to 3% weight of VOC	Volatile aromatic compounds should not intentionally be added to the product, but may exist as traces or pollutants provided quantities do not exceed 100 ppm (0.01 weight %, 100 mg / kg). Fillers may be comprised up to 3% weight of VOC

Durable wood alternative to conventionally impregnated wood[190]

This is wood that can serve in place of conventional impregnated wood and fulfils the criteria for wood constructions exposed to weather above soil. Assessment takes into account the raw materials that are added, ease of disposal, the origin of the wood used and the biological durability. Table A2-44 below provides the content requirements that durable wood must conform with in order to be awarded the Nordic Ecolabel.

Table A2-44: Content requirements for durable wood			
Biocides	**Products harmful to health**	**Organic solvents**	**Chemical residue**
Biocides, as defined by EU Directive 98/8/EEC, must not be used for impregnating the wood. This includes chemicals that contain arsenic, copper, chromium, tin, boron or creosote.	Substances used for impregnating wood must not be classified as: • Carcinogenic (R45, R49, R40); • Harmful to the reproductive system (R60 – R63); • Genetically harmful (R46, R68) However, products classified as CARC 3 R40 because of the content of furfuryl alcohol (Cas 98-00-00) can be used of certain requirements are met.	The chemicals to impregnate modify or treat the wood may not comprise more than 5% by weight of organic solvents.	Furfuryl alcohol must not be above 0.2% in weight in relation to the timber that is pre-dried.

[190] Nordic Swan website, Product criteria, accessed: http://www.nordic-ecolabel.org/Templates/Pages/CriteriaPages/CriteriaGetFile.aspx?fileID=131372001

Panels for the building, decoration and furniture industries[191]

Construction products that may qualify for Nordic Swan includes:

- wood based panels that are at least 85% wood in weight, with or without laminate finishes;
- plasterboards;
- mineral-based acoustic panels (where the primary function of the panel is to absorb sound); and
- solid wood that has been put together in panel form (e.g. by consumer).

This includes products for both indoors and outdoors. Typical applications include interior lining of ceilings, walls and floors, exterior wind proofing of walls as well as the manufacture of furniture and fittings (although the latter are not construction products).

The requirements outlined in Table A2-45 relate to mineral-based raw materials that constitute more than 5% weight of the finished panel. Table A2-46 relates to chemical products that are added to panels or used in the manufacture/production of the panels.

Table A2-45: Content requirements for mineral raw materials in panels

Heavy metals	Radioactive substances
The main component in the mineral raw material must not comprise more than the following amounts of heavy metal: • arsenic 20 mg/kg; • lead 50 mg/kg; • cadmium 1 mg/kg; • mercury 1 mg/kg; and • chrome III 500 mg/kg.	If the contents of the panel include any of the materials below, then documentation proving compliance with radioactive thresholds must be provided: • crushed material from granite/pegmatite, brick, ceramic tiles and light expanded clay aggregate; • plasterboard (gypsum); and/or • waste products from smelting of iron ore, or from the ash of coal or peat.

[191] Nordic swan website, Product criteria, accessed: http://www.nordic-ecolabel.org/Templates/Pages/CriteriaPages/CriteriaGetFile.aspx?fileID=157606001

Table A2-46: Content requirements for chemical products added to panels or used in the manufacture/production of the panels			
Compounds and additives	**Formaldehyde**	**Nanoparticles**	**VOC**
The following list of substances must not exist in the product The exception to this is contaminants from raw production, which includes residues from raw material production present in the finished product in concentrations under 100 ppm (0.0% by weight, 100 mg/kg): • halogenated chlorinated compounds (including chlorinated polymers); • perfluorooctanoic acid and its salts, esters and compounds and perfluorooctane sulphonate and compounds thereof; • bisphenol A compounds; biocides chlorophenols (and their salts and esters thereof) and dimethyl –fumarate; • isothiazolinones, more than 0.05% by weight; • mixture (3:1) of CMIT/MIT (5-chloro-2-methyl-4-isothiazolin-3-one/2-methyl-4-isothiazolin-3-one) more than 0.0015% by weight; • alkylphenols, alkylphenolethoxylates (APEO) or other alkylphenol derivatives; • phthalates; • aziridine and polyaziridines; • compounds that are carcinogenic, mutagenic and toxic for reproduction (category 1 and 2); • pigments and additives based on lead, tin, cadmium, chromium VI and mercury or compounds of them; • aromatic solvents in the chemical product, more than 1% by weight; • VOC more than 3% by weight; and • no biocides or products thereof may be used on the surface of the finished panel, or part of the finished product with the intention to add a disinfectant or antibacterial effect.	If free formaldehyde is used in chemical products that are used to produce wood based panels, the content of free formaldehyde must not exceed 0.2% in weight. The same content threshold of 0.2% in weight for free formaldehyde is also applicable to adhesive products used in mixture with a hardener. For rockwool, the content of free formaldehyde must not exceed 0.5% by weight. Should panels contain formaldehyde based additives, either thresholds related to the content and type of panel or related threshold limits must be met.	Nanometals, nanominerals, nanocarbon compounds or nanofluorine compounds must not actively be added to chemical products. Nanoparticles are considered to be microscopic particles where the dimensions are less than 100 nm.	VOCs used in the formulation of surface treatments must be below 5% by weight or not in excess of 10g/m^2 of the surface.

Small Houses, Apartment Buildings and Pre-school Buildings[192]

Buildings that fall within the scope of this criterion will have a low environmental and climatic impact, as well as a healthy indoor environment. More specifically, the Nordic Ecolabel will be awarded to those buildings that fulfil all obligatory requirements and achieve a minimum score of nine out of 22 for 'point scoring' measures related to:

- materials used;
- process undertaken to construct the buildings;
- damp prevention/ventilation measures;
- energy efficiency; and
- potential means of disposing of construction waste.

Chemical Building Product: Content Requirements

For the purpose of these requirements, chemical building products are liquid or non-cured chemical products that can be used during the manufacture of a construction product or applied to the construction works on site (e.g. adhesives and fillers). Table A2-47 below outlines the obligatory content requirements for chemical building products.

Chemical substances in Permanent Building Product: Content Requirements

The requirements outlined in Table A2-47 are applicable to building products used during pre-fabrication or on the construction site. These include:

- permanent sealing products;
- impregnated timber;
- insulation; and
- plastic products (e.g. for electrical wiring, waste water pipes, ceiling and wall coverings).

[192] Nordic Swan website, Product criteria, accessed: http://www.nordic-ecolabel.org/Templates/Pages/CriteriaPages/CriteriaGetFile.aspx?fileID=150283001

Table A2-47: Obligatory and 'Point Scoring' content related criteria for chemical substances in permanent building products		
Obligatory requirements		**Point scoring requirement**
Prohibited substances	**Nanoparticles**	**Chlorine-free plastic products**
Final products should not contain in quantities greater than 100 ppm the following substances: • halogenated paraffins - highly-chlorinated, short-chain (C10-C13) and medium-chain (C14-C17); • fluorinated propellants; • perfluorinated and polyfluorinated alkyl substances (PFAS); • alkylphenolethoxylates (APEO) and alkylphenol derivatives (APD); • brominated flame retardants; • phthalates; • boron compounds; • creosote; • benzo(a)pyrene, benzo(b)pyrene; • bisphenol A; • antimony trioxide; • heavy metals: lead, cadmium, arsenic, chromium (VI), mercury or their compounds; • monoacrylamid; and • organic tin compounds.	Unless it is shown that nanomaterials do not present a health hazard, there must be a clear procedure that shows how the building will be free from additives of nanometals, nanocarbon compounds and/or nanofluorine compounds. This documentation must be provided for the following construction product groups: • flooring; • kitchen and bathroom fittings; • windows; and • ventilation systems.	Points are awarded if all of the products within one of the following product groups are chlorine-free: • cable ducts (for electrical wiring); • plastic piping for central vacuum systems; • mains cables (excluding lifts); and • waste water pipes.

Timber and Fibre-Based Materials: Content Requirements

Wood fibre and bamboo can be certified under the Nordic Ecolabel provided they comply with these criteria. In addition to requirements regarding the source of the wood, pressure impregnated wood can only be used under certain circumstances and if it does not contain those prohibited substances listed in Table A2-47.

Other Content Requirements on Building Products, Materials and Interiors

There are also obligatory requirements for cladding and roofing, which must not contain lead or more than 10% by weight of solid copper. Also, if plastic layers are to be used for interior floors, walls and ceilings, chlorinated plastics must not be used.

Solid Biofuel Boilers

A solid biofuel boiler is typically one that is fired by wood, pellets of wood or on occasion, alternative fuel. Much of the criteria are concerned with efficiency and emissions. The only criteria specifically related to the content concerns surface treatments. More specifically, these must not contain pigments based on lead, cadmium, chromium, mercury or their compounds. Moreover, the treatment must not contain above 5% w/w of organic solvents.

Stoves[193]

For the purposes of the Nordic Swan, a stove is to be situated in the room that should be heated via radiation, although heat could also be circulated via a water or ventilation system. Examples of stoves include heaters such as wood stoves, slow heat release appliances (e.g. tiled stoves, stone clad stoves), inset stoves and sauna stoves. As with boilers, stoves must be fired on solid biofuel (wood, wood pellets or alternative biofuel).

Stoves that comply with the Nordic Ecolabel criteria will be highly efficient and will have low emissions of particles, carbon monoxide and organic gaseous carbon. There are also requirements on the content of construction product. This relates to the substances in chemical products, surface treatments and metal coating of parts (Table A2-48)

[193] Nordic Swan website, Product criteria, accessed: http://www.nordic-ecolabel.org/Templates/Pages/CriteriaPages/CriteriaGetFile.aspx?fileID=148846001

Table A2-48: Content requirements for stoves		
Chemical products	**Chemical substances**	**Metal coating of parts**
Chemical products used during the production of the stove or to treat the product must not be classified with any of the following: • very toxic (Aquatic 1 with H400, Chronic 1/2 with H410, H411; EUH 059); • very toxic (Acute Tox. 1/2 with H330, H310, H300, STOT SE 1 with H370); • toxic (Acute Tox. 2/3 with H331, H301 STOT SE 1 with H370 STOT RE 1 with H372); • sensitising (Resp. sens. 1 with H334 or Skin sens 1 with H317); • carcinogenic (Carc 1A/1B/2 with H350, H350i and/or H351); • mutagenic (Mut 1B/2 with H340 and/or H341); and • toxic for reproduction (Repr 1A/1B/2 with H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df, Lact with H362).	The following must not be added to the stove during manufacture or treatment of the stove: • lead, mercury, hexavalent chrome, cadmium and their compounds; • halogenated organic compounds; • alcylephenols, alcylephenolethoxylates or other substances which may form alcylephenols or alcylephenolethoxylates; and • phthalates.	The following should not be added to the metal coating of the parts: • lead; • mercury; • cadmium; • chrome; and • nickel additives. However, parts may be covered with chrome, nickel or compounds if these parts will be subjected to high chemical or mechanical wear.

Floor Coverings

Floor coverings that can attain the Nordic Swan are bamboo flooring, solid wood, parquet, laminate, linoleum and carpeting. Such flooring must be for indoor use and suitable for concrete, timber joist or other subfloor.

Compliant products must fulfil criteria related to the source of the raw materials, emissions, waste management and content of the flooring

Textile Fibre: Content Requirements

If textile fibres and foam constitute more than 15% by weight of the floor covering, then at least 80% of the fibre content must comply with the following content requirements:

- biocides in wool fibre must be below 0.5 ppm for Group A substances, 2 ppm for Group B substances, 0.5 ppm for Group C substances and 2 ppm for Group D substances (see Table A2-49);

- antimony in polyester fibre must not exceed 260 ppm;
- lead-based pigments must not be used in polypropylene fibre;
- the following must not be used or be an ingredient within a preparation or substance that is used:
  - alkylphenolethoxylates (APEO);
  - linear alkylbenzene sulfonates (LAS);
  - bis (hydrogenated tallow alkyl) dimethyl ammonium chloride (DHTDMAC);
  - distearyldimethyl ammonium chloride (DSDMAC);
  - ditallow dimethyl ammo-nium chloride (DTDMAC);
  - ethyl diamine tetracetate (EDTA); and
  - diethylene triamine pentaacetate (DTPA)
- foam rubber (natural and synthetic latex) must not contain 1.3-butadiene in quantities of more than 1 mg/kg; and
- hydrofluorocarbons (CFC, HCFC, HFC) and methylene chloride must not be used for foaming.

Table A2-49: Biocide groups for wool fibre

Group	Biocide
A	α- hexachlorocyclohexane
	β- hexachlorocyclohexane
	γ- hexachlorocyclohexane (lindane)
	δ- hexachlorocyclohexane
	Aldrin
	Dieldrin
	Endrin
	P, p´-DDT
	P, p´-DDD
B	Propetamphos
	Diazinon
	Dichlofenthion
	Fenchlorphos
	Chlorfenvinphos
C	Cyhalothrin
	Cybermethrin
	Deltamethrin
	Fenvalerate
	Flumethrin
D	Diflubenzuron
	Triflumuron

Chemical Products: Content Requirements

Chemical products that are used in or on the floor coverings must comply with the criteria outlined in Table A2-50.

Table A2-50: Content requirements for floor coverings

Toxic Substances	Biocides	Nanoparticles
Chemical products with the following classifications should not be added to the flooring: • carcinogenic (R45, R49, R40); • toxic for reproduction (R60, 61, R62, R63); • mutagenic (R46, R68); and • toxic (R23-28) Materials that are classified as allergenic which are added to the floor covering must not exceed 0.1% by weight in the final finished floor covering. Other substances which must not be added to floor coverings include: • chlorinated/brominated paraffins; • halogenated flame retardants; • organic tin compounds; • phthalates; • fluorinated compounds; • cadmium; • lead; and • mercury. Finally, azo-based pigments that upon decomposition produce carcinogenic acrylamines are prohibited.	Biocides, whether pure active substances or biocidal products, must not be added to the floor covering for the purposes of disinfectant or antibacterial treatment.	Nanometals, nanominerals, nanocarbon or nanofluorine must not be added to the floor covering. Traces of nanoparticles which exist in the product, but have not been intentionally added to fulfil a purpose, are exempted from this requirement.

Window or Exterior Doors[194]

The criteria for windows and exterior doors are primarily focused on their energy efficiency and environmental impact. There is however some content requirements related to human health as outlined in Table A2-51 below.

[194] Nordic Ecolabel website, accessed: http://www.nordic-ecolabel.org/Templates/Pages/CriteriaPages/CriteriaGetFile.aspx?fileID=139074001

Table A2-51: Content requirements for windows and exterior doors				
Insulation material	**Chemical products**	**CMR substances**	**Prohibited substances**	**Nanomaterials**
Thermal insulation must be free from halogenated flame retardants or flame retardants that contain borax or boric acid. Fluorinated propellants must not be used to manufacture expanding insulation material. Mineral insulation material must not be classified as carcinogenic, as defined under Directive 97/69/EC.	Chemical products that are used during the manufacture of windows and doors must not be classified under the DSD or DPD as: • carcinogenic (T with R 45 or R49; xn with R40); • mutagenic (T with R46; Xn with R68; • toxic for Reproduction (T with R60 or R61; Xn with R62 or R63); • very toxic (T+ with R26, R27, R28, or R39); • toxic (T with R 23 or R24, R35, R39, or R48; and • Xn with R22, R48, or R68	Chemical products that are used in the manufacture of windows and doors must not contain substances classified as: • carcinogenic (Carc with R45 and/or R49); • mutagenic (Mut with R46); and • toxic for reproduction (Rep with R62 and/or R63). Moreover, the total content of substances that have been classified as carcinogenic (Carc with R40), mutagenic (Mut with R68) and/or toxic for reproduction (Rep with R62 and/or R63) must not be above 0.5% by weight in windows and doors. Note: DBT and DOT organic tin compounds (with exception of TBT and TPT) are permitted if below thresholds for some polymers.	The following substances must not be used in windows or exterior doors: • halogenated organic solvents; • alkylphenolethoxylates (APEO) and alkylphenol derivatives (APD); • perfluorinated and polyfluorinated alkylated substances (PFAS); • phthalates, with exemption of sealants; • in sealants the following phthalates are prohibited: DEHP, DBP, BBP, 711P, DIBP, DMEP, DIDP or DINP; • halogenated flame retardants; • boron compounds; and • bisphenol A.	Nanomaterials, nanominerals, nanocarbon compunds and/or nanoflurine compounds may only be used in the manufacture of these products if it has been shown that they do not present environmental or health problems.

Heat Pumps

Heat pumps that conform to the Nordic Ecolabel meet energy efficiency requirements, requirements for refrigerants and other environmental loads. There are also some content requirements, as outlined below.

Table A2-52: Content requirements for heat pumps		
Phthalates	**Flame retardants/DecaBDE**	**Flame retardants**
The following must not be added to plastic material: • dicyclohexyl phthalate; • diisobutyl phthalate; • dibutyl phthalate (DBP); • benzylbutyl (BBP); • diethylhexyl phthalate (DEHP); • diisooctyl phthalate; • diisononyl phthalate (DINP); and • diisodecyl phthalate (DIDP).	DecaBDE and highly chlorinated short-chain chloroparaffins is prohibited.	Halogenated flame retardants that are not otherwise.

Testing/assessment

Depending on the product group and nature of the hazard, testing and assessment takes the form of:

- Manufacturer declaration - relevant declaration or data sheet (e.g. declaration that biocides are not used or Material Safety Data sheet) are provided;
- Product testing - relevant tests are conducted by an impartial and competent test institution e.g. for durable wood, the laboratory that performs the chemical analysis must meet the general requirements of EN ISO 17026 or be an official, GPL approved, analytical laboratory.

All documentation supplied in conjunction with a license application or registration will remain confidential.

Experts from the Nordic Ecolabelling organisations develop proposals for criteria. Other experts are often called upon to give their views, and these can represent other environmental organisations, industry or the government. Before The Nordic Ecolabelling Board finalises the criteria, they are sent out for public review in 60 days. They are also available to the general public on the national organisation's websites.

To ensure that a Nordic Ecolabelled product or service is at the cutting edge from an environmental point-of-view, criteria are continually revised. Approximately every three to five years, the criteria documents are reviewed and products carrying a Nordic Ecolabel license must apply and fulfil the new criteria requirements.

In order to select the product groups which are most suitable for the Nordic Ecolabelling scheme, a product is analysed for its relevance from an environmental point of view, potential for improvement among the products on the market and the degree to which the product can be controlled and promoted by ecolabelling. If the Nordic Ecolabelling Board decides that these three parameters show that it would be an advantage to develop criteria for the particular product or service, then a study is started on developing criteria for this product group. The whole procedure takes on average two years.

Communicating conformity

The Nordic Ecolabel is affixed to products that comply with the requirements. These requirements expire after a set date. There is good customer recognition for the scheme and acknowledgement that the standards set by the Nordic Swan are stringent with a high degree of brand loyalty[195].

Objectivity/impartiality

Manufacturers provide relevant documentation and an independent laboratory undertakes testing.

Extent of use of the scheme

The Nordic Ecolabel reports that by the end of December 2012, there were around 2,100 license holders. Of these, around two thirds are location based services (hotels, car washes) and the remaining third are for products. However, this does not give an indication as to the number of products certified under the Nordic Ecolabel, as each product license can include a number of products.

Table A2-53 below provides a breakdown of the product groups listed under the Nordic Ecolabel, as displayed on the website. This would suggest that the Nordic Ecolabel is more focused on consumers, as only 15% of the product groups relate to construction products.

[195] Pers. comm. 2013

Table A2-53: Products certified under Nordic Swan[196]			
Mandate	**Title**	**Number of criteria/standard**	**Products in scheme**
M119	Floorings	1	Floor coverings (1)
N/A	Other construction products/works	8	Chemical building products (1), Durable wood Alternative to conventionally impregnated wood (1), Heat pumps (1), Panels for the building, decorating and furniture industry (1), Small houses, apartment buildings and pre-school buildings (1), Stoves (1) Solid Biofuel Boilers (1), Windows and exterior doors (1)
N/A	Non-construction products	53	Consumer goods/ location based services (53)

The Nordic Ecolabel has achieved widespread coverage of its criteria for private houses, with almost all the big Nordic construction companies being customers. This has sparked an interest in the possibility of introducing a program for the renovation of houses under the scheme.

Future developments

The Nordic Swan believes that the European Ecolabel could serve as a basis for a Europe-wide construction product certification scheme. Whilst this scheme only covers flooring at present, the introduction of new criteria could widen the scope of the scheme.

SundaHus Miljödata (Sweden)

Introduction

It has been estimated that 40% of material and energy use in Sweden can be attributed to the construction sector. This same sector also accounts for 50,000 different materials and chemical products.

Objectives of the scheme

SundaHus promotes sustainable development within the construction sector through the application of its environmental data tool[197]. This allows prospective purchasers to amongst

[196] Nordic Swan website, Product criteria, accessed: http://www.nordic-ecolabel.org/criteria/product-groups/?p=1

other things, view the contents of products prior to purchase. By equipping consumers with information on the substances used to manufacture a product, the materials it contains and hazards it presents, SundaHus hopes to encourage demand for products that present less of a hazard to the environment and health throughout their life cycle.

Geographical coverage

This scheme is applied to the Swedish market.

Focus of the scheme (content vs. emissions)

Product assessment focuses on the life cycle and as such includes the content of potentially hazardous substances. There are 3 broad categories; phase out substances, priority risk substances and other substances which are hazardous to health. The scheme also considers the occupational health and environmental impacts of products during the life cycle phases; production, construction, use and disposal.

Products covered

SundaHus covers a variety of products, including construction products and products used during the operation and the maintenance of a building (appliances, cleaning agents, furniture), these include:

- thermal insulation;
- plastering, painting, protective coatings, wood preservation, concrete impregnation and anti-graffiti coatings;
- floorings and wall tiles;
- house components e.g. windows, doors, stairways, balconies;
- apparatus and pipes for piping and pipeline networks;
- equipment, ducts, diffusers for ventilation and indoor climate systems;
- electrical and telecommunications systems;
- furniture and household appliances; and
- sealants for structural use in joints in buildings and fastening products.

Substances covered (including award criteria)

[197] SundaHus website: accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DSundaHus%26client%3Dfirefox-a%26hs%3D01P%26rls%3Dorg.mozilla:en-GB:official%26channel%3Dnp&rurl=translate.google.co.uk&sl=sv&u=http://www.SundaHus.se/home.aspx&usg=ALkJrhjhmJO54moHQmmzWuhBYhwudEZyvw

The overall assessment of a product is based on its life cycle. Focusing on those aspects of the scheme related to the content of potentially hazardous substances, the substances of interest are phase-out substances and priority risk reduction substances, as outlined in Table A2-54 and PRIO[198] (a tool for risk reduction of chemicals).

Table A2-54: Overview of phase out substances and risk reduction substances[199]	
Property	**Classification according to KIFS 2005:7 for determination of the intrinsic properties**
Phase out substances	
Carcinogenic	R45: May cause cancer R49: May cause cancer by inhalation
Mutagenic	R46: May cause heritable genetic damage
Toxic to reproduction	R60: May impair fertility R61: May cause harm to the unborn child
Endocrine disrupter	Assessment is on a case by case basis
Hazardous metals	Hg, Cd, Pb
PBT / vPvB	There are detailed criteria, which are very much the same as PBT screening criteria in REACH
Ozone depleting substance	R59: Dangerous for the ozone layer
Risk reduction substances	
Very high acute toxicity	R26: Very toxic by inhalation R27: Very toxic by skin contact R28: Very toxic by swallowing R39/26: Very toxic: danger of very serious irreversible effects through inhalation R39/27: Very toxic: danger of very serious irreversible effects in contact with skin R39/28: Very toxic: danger of very serious irreversible effects if swallowed
Allergenic	R42: May cause sensitisation by inhalation R43: May cause sensitisation by skin contact
High chronic toxicity	R48/23: Toxic: danger of serious damage to health by prolonged exposure through inhalation R48/24: Toxic: danger of serious damage to health by prolonged exposure in contact with skin R48/25: Toxic: danger of serious damage to health by prolonged exposure if swallowed
Mutagenic	R68: Possible risk of irreversible effects
Environmentally hazardous, long term effects	R 50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment R53: May cause long-term effects in the aquatic environment
Potential PBT / vPvB	There are detailed criteria, which are very much the same as the PBT screening criteria in REACH

[198] PRIO criteria: This is a web-based tool based that divides high priority substances into two levels of prioritisation, phase-out substances and risk reduction substances. The criteria for PRIO substances is based on the Environmental Quality Objective for a Non Toxic Environment and REACH.

[199] KEMI website: PRIO – a tool for Risk Reduction of Chemicals, accessed at http://www2.kemi.se/templates/PRIOEngframes____4144.aspx

This scheme also takes into account other occupational health and environmental impacts that a construction product will have throughout its lifecycle during:

- chemical hazards that may exist during the manufacture/production stages;
- construction phase;
- usage phase; and
- disposal[200].

Product information is presented in the environmental data tool, which includes symbols denoting the presence of hazardous substances. Table A2-55 below, lists the information and the points that are awarded or deducted in relation to particular criteria.

Table A2-55: Symbols used to indicate the presence of potentially hazardous content under SundaHus Assessment Criteria[201]

Symbol	Criteria	Points awarded
Priority risk reduction substances		
R	Construction product contains ≥ 2 % of at least one priority risk reduction substance or the amount of a priority risk reduction substance is not known	-1
(R)	A priority risk reduction substance was used in the manufacture of the product	N/A
P2	Product contains at least one potential PBT / vPvB substance, that is classified as a priority risk reduction substance	-1
(P2)	A potential or actual PBT / vPvB classified as a priority risk reduction substance has been used to the manufacture the product, but is no longer present	-1
Phase-out substances		
U	Product contains ≥ 0.1% of at least one phase-out substance	- 2
(U)	At least one phase-out substance has been used in the manufacture of the product	- 2
P1	Product contains at least one PBT / vPvB that is classified as a phase out substance	-2
(P1)	A potential or actual PBT / vPvB classified as a phase out substance has been used to the manufacture the product, but is no longer present	-2
Other substances		

[200] SundaHus website, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DSundaHus%26client%3Dfirefox-a%26hs%3D01P%26rls%3Dorg.mozilla:en-GB:official%26channel%3Dnp&rurl=translate.google.co.uk&sl=sv&u=http://www.SundaHus.se/home.aspx&usg=ALkJrhjhmJO54moHQmmzWuhBYhwudEZyvw

[201] SundaHus (2009): SundaHus Environmental Data Assessment Criteria, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DSundaHus%26client%3Dfirefox-a%26hs%3D01P%26rls%3Dorg.mozilla:en-GB:official%26channel%3Dnp&rurl=translate.google.co.uk&sl=sv&u=http://www.SundaHus.se/custom/reference/Bedomningskriterier.pdf&usg=ALkJrhhjeDN-HrXTON6gtnlwL8lhxIv-Hw

H1	Product contains at least one substance that has been designated as a Category 1 substance for the purposes of the European Commission's hormone disrupters list (there is evidence of endocrine disrupting activity in at least one species using intact animals)	-2
(H1)	Product was manufactured using at least one substance that has been designated as a Category 1 substance for the purposes of the European Commission's hormone disrupters list (there is evidence of endocrine disrupting activity in at least one species using intact animals), but that substance is no longer present	-2
H2	Product contains at least one substance that has been designated as a Category 2 substance for the purposes of the European Commission's hormone disrupters list (at least some in vitro evidence of biological activity related to endocrine disruption)	N/A
(H2)	Product was manufactured using at least one substance that has been designated as a Category 2 substance for the purposes of the European Commission's hormone disrupters list (at least some in vitro evidence of biological activity related to endocrine disruption), but that substance is no longer present	N/A
	Product contains at least one environmentally hazardous substance. Risk phrases between R50 – R59 will identify the appropriate environmental risk	- 2
()	At least one environmentally hazardous substance was used to manufacture the product. R-phrases between R50 – 59 will identify the environmental risk	
	This symbol indicates that the hazardous substances are hazardous during production. This is associated with risk phrases between R20 - R29, R31 – R49 and R60 – R68	- 1
	This symbol indicates that the presence of hazardous substances during the building phase. This is associated with risk phrases R20 - R29, R31 – R49 and R60 – R68	
	This symbol indicates that hazardous substances are used during the usage phase. It is associated with risks for nickel contact allergy.	
N/A	Product can be re-used	+ 2
N/A	Product can be recycled	+ 1
N/A	Product will be need to be sent to landfill	
N/A	Product will be classified as hazardous waste	- 2

As is shown in Tables A2-56 and A2-57 below, there are five coloured arrows and five corresponding scores depending on the content of the product. Table A2-56 highlights the criteria for chemical products whilst Table A2-57 lists the criteria for 'Other products'. It should be noted that R-phrases applied to final products are not applicable to 'other products'.

Table A2-56: Arrow colour – content requirements for chemical products under SundaHus Assessment Criteria [202]			
Colour	**Classified as hazardous to health and/or the environment**	**Criteria**	**Points awarded**
Black 	Yes	If any of the following are fulfilled: • criteria for phase out substances are fulfilled; • contains ≥0.1% of one or more phase-out substance; or • ≥2% of a substance has been used for manufacturing the product.	- 5
		If the following criteria are satisfied with regard to *substances* and R-phrases: • the product has included substances that amount to ≥0.1% and have R-phrases that fulfil the criteria for phase-out substances; or • the product has been manufactured using included substances in amounts ≥2% that have R-phrases that fulfil the criteria for phase-out substances. These substances do not need to still be contained within the final product. If the following criteria are satisfied with regard to R-phrases and the product: • the product has an R-phrase that fulfils the criteria for phase-out substances.	
Red 	Yes	The product contains a priority risk reduction substance	- 3
		If the following criteria are satisfied with regard to R-phrases and the product: • R-phrase that fulfils the criteria for priority risk-reduction substances.	
Orange 	Yes	Although classified as hazardous to health/environment, it is not to the extent that criteria for priority risk-reduction substances are fulfilled.	0
		If the following criteria are satisfied with regard to R-phrases and the product: • R-phrases above 20, provided they do not result in a PRIO classification.	

[202] SundaHus (2009): SundaHus Environmental Data Assessment Criteria, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DSundaHus%26client%3Dfirefox-a%26hs%3D01P%26rls%3Dorg.mozilla:en-GB:official%26channel%3Dnp&rurl=translate.google.co.uk&sl=sv&u=http://www.SundaHus.se/custom/reference/Bedomningskriterier.pdf&usg=ALkJrhhjeDN-HrXTON6gtnlwL8lhxIv-Hw

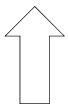
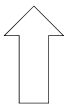
Table A2-56: Arrow colour – content requirements for chemical products under SundaHus Assessment Criteria [202]			
Colour	**Classified as hazardous to health and/or the environment**	**Criteria**	**Points awarded**
Yellow 	No	If any of the following are fulfilled: • will contain one or more substances hazardous to health/environment; or • product leads to the generation of hazardous wastes (defined in Waste ordinance – SFS 2001: 1063). If the following criteria are satisfied with regard to R-phrases and substances: • R- phrases above 20. If the following criteria are satisfied with regard to R-phrases and the product: • no R-phrases above 20.	+ 3
White 	No	• Product may contain health and/or environmental agents ≤ 0.1% that are hazardous to health/environment; or • ≤0.1% of phase out substances, either in the final product or were used in its manufacture	+ 5

Table A2-571: Arrow colour – content requirements for other products under SundaHus Assessment Criteria [203]			
Colour	**Classified as hazardous to health and/or the environment**	**Criteria**	**Points awarded**
Black 	Yes	If any of the following are fulfilled: • product contains ≥0.1% of one or more phase out substances; or • 2% of a phase out substance has been used for manufacturing the products.	- 5
		If the following criteria are satisfied with regard to R-phrases and	

[203] SundaHus (2009): SundaHus Environmental Data Assessment Criteria, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DSundaHus%26client%3Dfirefox-a%26hs%3D01P%26rls%3Dorg.mozilla:en-GB:official%26channel%3Dnp&rurl=translate.google.co.uk&sl=sv&u=http://www.SundaHus.se/custom/reference/Bedomningskriterier.pdf&usg=ALkJrhhjeDN-HrXTON6gtnlwL8lhxIv-Hw

Table A2-571: Arrow colour – content requirements for other products under SundaHus Assessment Criteria [203]			
Colour	**Classified as hazardous to health and/or the environment**	**Criteria**	**Points awarded**
		substances: • the product contains included substances in amounts ≥0.1% with R-phrases that fulfil the criteria for phase-out substances; or • the product has been manufactured using included substances in amounts ≥2% that have R-phrases that fulfil the criteria for phase-out substances. These substances do not need to still be contained within the final product.	
Red 	Yes	The product contains ≥ 2%, or the amount is not known, of a priority risk reduction substance. If the following criteria are satisfied with regard to R-phrases and substances: • the product is manufactured with included substances in amounts ≥2% and with R-phrases that fulfil the criteria for priority risk reduction substances.	- 3
Orange 	Yes	The product is comprised of ≥ 2%, or an unknown amount, of one or more substances that are hazardous to health/environment. If the following criteria are satisfied with regard to R-phrases and substances: • the product is manufactured with included substances in amounts ≥2% and with R-phrases that fulfil the criteria for priority.	0
Yellow 	No	If any of the following are fulfilled: • the product contains ≤2% of one or more substances that are hazardous substances to health/environment; • ≥2% of an included substance that is hazardous to health/environment has been used to manufacture the product; or • product leads to the generation of hazardous waste. If the following criteria are satisfied with regard to R-phrases and substances: • product contains included substances in amounts ≤2% and with R-phrases above 20; or • the product is manufactured with included substances	+ 3

Table A2-571: Arrow colour – content requirements for other products under SundaHus Assessment Criteria [203]			
Colour	**Classified as hazardous to health and/or the environment**	**Criteria**	**Points awarded**
		in amounts >2% and with R-phrases above 20. The substance does not need to still be contained within the product.	
White 	No	Product may contain ≤ 0.1% of phase-out substances in the completed product or its manufacture.	+ 5
		If the following criteria are satisfied with regard to R-phrases and substances: • there must be no R-phrases above 20.	

In addition, there are also unique criteria for the following products:

- copper in contact with water;
- zinc in contact with water; and
- prion.

Testing/assessment

Products are divided into 'chemical products' or 'other products' and assessed by collecting all available product documentation (e.g. safety data sheet, building product declarations).

Communicating conformity

Information on the potentially hazardous content of construction products and substances used to produce the construction product is communicated to subscribers of the SundaHus database through the use of arrows, symbols and parentheses. Other symbols indicate during which phase the health hazards occur. Many of the indicators have a corresponding negative or positive score. For example, a black arrow indicates the presence of a phase out substance which should be avoided, resulting in a negative score, '-5'. All of the individual scores are added together to give an overall assessment for the product.

Table A2-58: Overall assessment, SundaHus[204]	
Total Score	**Letter Awarded**
2, 3, 4,	A
-6, -5, -4, -3, -2, -1, 0, 1	B
-7, -8, -9, 10	C
Products with missing documentation or incomplete information	D

Objectivity/impartiality

In accordance with the national objective of working towards a 'non-toxic environment', if SundaHus receive only very general information about a product, the 'worst case' rule is applied. This means that a product is assessed as if it contains the health/environment agents that can occur in products of the same type. For example, a lack of information on an acrylate polymer was assumed to contain DINP plasticiser, kathlon, acrylonitrile and styrene[205].

Extent of use of the scheme

Subscribers of the SundaHus database can view this collated information and compare construction products in a standardised format[206]. Listed on the database, there are currently 74,587 articles and 27,425 unique products. The nature of the database means it is not possible to categorise the products according to the CEN mandates as with other schemes.

Table A2-59: Construction products certified by SundaHus	
Product group	**Number of products**
Preliminary work, relief work, decontamination work, moving, dismantling, demolition, clearance	55
Terracing, piling, soil reinforcement layers in the soil	160
Geogrids, geonets, geosnythetics, vegetation surfaces, plantations, land and road constructions	776
Site casted constructions	761
Masonry	306
Structures of prefabricated elements	461

[204] SundaHus website: accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DSundaHus%26client%3Dfirefox-a%26hs%3D01P%26rls%3Dorg.mozilla:en-GB:official%26channel%3Dnp&rurl=translate.google.co.uk&sl=sv&u=http://www.SundaHus.se/home.aspx&usg=ALkJrhjhmJO54moHQmmzWuhBYhwudEZyvw

[205] Ibid

[206] Ibid

Formwork of metal and wood	653
Thermal insulation of houses	1,030
Layers of construction paper, waterproofing mats, asphalt, canvas, plastic film, sheet steel, overlay plates	538
Sheets of various materials (wood, cementicious, metal, glass, inorganic fiber material)	737
Plastering, painting, protective coatings, wood preservation, concrete impregnation and anti-graffiti coatings	5,996
Floorings and wall tiles	2,858
House components (e.g. windows, doors, wall and roof openings, stairways, balconies etc.)	2,127
Apparatus and pipes etc. for piping and pipeline networks	13,985
Equipment, ducts, diffusers etc. for ventilation and indoor climate systems	6,084
Insulation of pipes, tubing and machinery	625
Apparatus, equipment, cables, etc., electrical and telecommunications systems	23,774
Apparatus and equipment and cables in electrical and telecommunication systems	1,019
Apparatus for controlling and monitoring	999
Equipment, machinery, etc., for transport	362
Furniture and household appliances	2,278
Labeling, documentation of products	236
Sealants for structural use in joints in buildings, fastening products etc.	7,296

BRE Environmental Assessment Method (UK/International)

Introduction

BREEAM is a voluntary environmental assessment method for buildings developed by BRE Global. BREEAM covers a number of building life cycle stages from 'Master' planning of whole communities and New Construction projects, through to Refurbishment projects and existing buildings in-use. In new buildings there is a two stage assessment and certification approach. The interim assessment begins from the early design stage culminating in interim certification typically before construction begins on site. The final assessment and certification is awarded upon completion of the building.

Objectives of the scheme

The scheme sets the standard for best practice in sustainable design, construction and operation and provides a measure of a building's environmental performance. Developers, designers and building operators may use the scheme in order to meet client requirements, reduce running costs or meet corporate environmental objectives.

Geographical coverage

Although BREEAM was established in the UK, it is now an international brand with the format being adapted for use in Germany, the Netherlands, Norway, Spain and Sweden. At the end of 2012 there were more than 700 buildings certified under the scheme outside the UK[207].

Focus of the scheme (content vs. emissions)

Many of the categories assessed do not fall within the scope of this study. Under the 'Materials' section more credits are awarded to the building for the use of materials with an A rating under BRE Global. The emission of volatile organic compounds from internal surfaces is considered under the 'Health and wellbeing' section.

Products covered

Entire buildings are covered.

Substances covered (including award criteria)

There are nine core assessment categories and a final category focusing on innovation:

- management;
- health and wellbeing;
- energy;
- transport;
- water;
- materials;
- waste;
- land use and ecology;
- pollution; and
- innovation[208].

Within the materials category, credits are awarded for the use of construction products that have a low environmental impact, are responsibly sourced, and designed for robustness and avoidance of hazardous chemicals.

The health and wellbeing category refers to indoor air quality measures which may encompass measures on substances that are regulated by the Dangerous Substances Directive and substances that may damage human health; these include heavy metals, arsenic, chromium VI and regulated biocides. Criteria also include VOC emission thresholds for the various product groups.

[207] BREEAM website: Schemes, accessed at http://www.breeam.org/podpage.jsp?id=54

[208] Department Education Northern Ireland: Environmental Assessment Guide, accessed at http://www.deni.gov.uk/appendix_9_-_breeam_-_environmental_assessment_guide-2.pdf

Testing/assessment

The assessment uses recognised measures of performance, which are set against benchmarks, to evaluate a building's specification, design, construction and use. The assessment is carried out by a licensed organisation using UKAS accredited assessors.

The overall performance is made up of the following elements:

- BREEAM rating level benchmarks;
- minimum BREEAM standards;
- environmental section weightings; and
- BREEAM assessment issues and credits[209].

Depending on whether it is a new construction or refurbishment of an existing building, the minimum requirements vary. They include focus on management, energy use, waste use, health, pollution and materials use.

The environmental section weightings, derived from a combination of consensus base weightings and experts, helps to define and rank the environmental impacts (Table A2-60 below).

Table A2-60: BREEAM environmental section weightings

Environmental section	Weighting (%) (refurbishment)[210]	Weighting (new construction)[211]
Management	12	12
Health and wellbeing	17	15
Energy	43	19
Transport	11	8
Water	8	6
Materials	3	12.5
Waste	6	7.5
Land use and ecology	N/A	10
Pollution	6	10
Total	100	100
Innovation (additional)	10	10

[209] BREEAM (2012): BREEAM Refurbishment – Domestic Buildings (Technical Manual SD5072 -2012 -2.0), accessed at http://www.breeam.org/domrefurbmanual/

[210] Ibid.

[211] BREEAM (2011): New Construction – Non-domestic buildings (Technical Manual SD5073 – 3.3:2011), accessed at http://www.breeam.org/BREEAM2011SchemeDocument/

Communicating conformity

Certified buildings receive a BREEAM certificate and are also listed in the Green Book Live website.

Objectivity/impartiality

BRE Global provides independent, third-party certification of environmental products and services. BRE Global is a UKAS accredited laboratory which helps to impart competence and impartiality. BRE Global develops the BREEAM methodology, trains and licenses independent BREEAM Assessors, who then conduct assessments against the methodology and certify whether a project has met the requirements, the assessment report is then audited by BRE Global for accuracy.

German Sustainable Building Council System (DGNB System)[212]

Introduction

The DNGB System was devised by the German Sustainable Building Council and is a voluntary scheme used for the assessment of environmental and economic sustainability of buildings and urban districts.

Objectives of the scheme

Promote solutions in the planning, construction and operation of buildings which realise the goals of sustainable development.

Geographical coverage

The DGNB System can be applied internationally and within Europe, countries within which it can be applied include: Bulgaria, Greece, Germany, Luxembourg, Denmark, Czech Republic, Austria, Ireland, Finland, Iceland, Italy, Norway, Poland, Slovenia, Spain and Hungary.

Focus of the scheme (content vs. emissions)

The presence of harmful or dangerous substances is considered under the 'Local Environmental Impact' criteria (e.g. heavy metals) and under the 'Indoor air quality' criteria (e.g. TVOC and formaldehyde).

212 Deutsche Gesellschaft für Nachhaltiges Bauen

Products covered

The DGNB System applies to buildings and urban districts.

Substances covered (including award criteria)

The sustainability concept goes further than the three-pillar model and encompasses six quality aspects: environmental, economic, sociocultural and functional, technology, process and site quality sections[213]. Under the sections there are 50 criteria, these include Life cycle Assessment, Indoor Air Quality and Pollution Control[214].

Each of the criteria has a defined target value, with up to 10 points being awarded. The overall score for each section and the building as a whole are calculated using the assessment points and the relevant weighting.

Projects can be awarded either a bronze, silver or gold award depending on the total score percentage as outlined in Table A2-61. However, to ensure a uniform standard, projects must also comply with the nominal performance index for the relevant certificate. Thus projects for the bronze award must score at least 35%.

Table A2-61: Product certificate awards for DGNB System

Total Performance Index	Nominal Performance Index	Award
From 50%	35%	Bronze
From 65%	50%	Silver
From 80%	65%	Gold

Testing/assessment

The certification is carried out by an auditor of the contractors choosing, usually from the list provided on the website. There are 4 stages to certification:

- auditor registers the contractor with the DGNB System;
- auditor submits the required documentation to DGNB;
- series of compliancy tests are carried out, with the evaluation result being confirmed by the contractor and the DGNB Certification Committee; and
- DGNB certificate is awarded[215].

[213] DGNB System website: The DGNB sustainability concept – The new quality of building, accessed at http://www.dgnb-system.de/en/system/dgnb-sustainability_concept/

[214] DGNB System website: Criteria, accessed at http://www.dgnb-system.de/en/system/criteria/

[215] DGNB website: The certification process, accessed at http://www.dgnb-system.de/en/certification/certification-process/

Communicating conformity

Projects which have been awarded the DGNB label are listed on the DGNB website, which provides further details, including a detailed breakdown of the building evaluation results and site evaluation results. Certified projects are also permitted to use the logo.

Objectivity/impartiality

The contractor enters into separate contracts with the auditor of their choosing and DGNB. There is no contractual relationship between the auditor and DGNB, which provides a degree if objectivity and impartiality[216].

Extent of use of the scheme

The headline figures from the DGNB system website states that to date there are more than 300 registrations, more than 250 pre-certificates and more than 150 certificates.

Eco Green Building (Sweden)

Introduction

Property owners are now obligated to produce environmental certificates for their buildings. However, the SundaHus website notes that major property owners are increasingly certifying their buildings in order to add value for prospective tenants and buyers[217]. Similarly, in response to consultation, a construction company noted that purchasers are prepared to pay a premium for completed builders that can demonstrate that they present reduced health risks.

Objectives of the scheme

A consensus has yet to emerge in Sweden as to the best way to classify buildings. The Sweden Green Building Council is an organisation that any manufacturer or company within the construction and real estate sector may join. It promotes green building and sustainable construction by:

[216] DGNB website: The certification process, accessed at http://www.dgnb-system.de/en/certification/certification-process/

[217] SundaHus (2009): Environmental Data Assessment Criteria, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3DSundaHus%26client%3Dfirefox-a%26hs%3D01P%26rls%3Dorg.mozilla:en-GB:official%26channel%3Dnp&rurl=translate.google.co.uk&sl=sv&u=http://www.SundaHus.se/custom/reference/Bedomningskriterier.pdf&usg=ALkJrhhjeDN-HrXTON6gtnlwL8lhxIv-Hw

- developing a certification system;
- educating key stakeholders on the use of these certifications and the importance of sustainable construction;
- promoting green legislation; and
- working towards a situation where it is beneficial for all stakeholders to undertake sustainable building.

Geographical coverage

This scheme applies to Sweden.

Focus of the scheme (content vs. emissions)

The national Green Building Scheme that has been developed comprises 15 indicators across three areas; energy, indoor environment and chemical substances. SundaHus has worked with Swedish companies, public authorities and the Swedish Green Building Council to develop a tool that can be used by this scheme and specifically tailored for the Swedish market. Thus it takes into account the material and products that are most suitable for the Swedish market[218].

Products covered

There are criteria for new and existing buildings. When buildings are completed, information for various products is verified (e.g. building materials used, ventilation systems and moisture and water safety).

Substances covered (including award criteria)

The final award of the certificate will be influenced by the presence or absence of hazardous substances in the building. If there is no information provided, a bronze certificate will be awarded. If some phase out substances have been used and are above the stated threshold limits, then a silver certificate will be awarded[219]. Finally, a gold rating can be achieved:

- if information on where construction materials have been stored and their approximate volumes has been kept in a logbook. This can be achieved using a tool such as 'BASTA Project Manager'; and

[218] Sweden Green Building Council Website: accessed at http://www.sgbc.se/in-english

[219] Miljöbyggnad: A Swedish certification that cares about People and the Environment, accessed at http://www.sgbc.se/component/docman/doc_download/163-broschyr-engelska?Itemid=157

- products used in the building must not contain phase-out substances (according to KEMI criteria). This can be guaranteed by using BASTA and BETA registered products[220].

Testing/assessment

Assessment takes the form of registration, application, validation, decision, certification and verification. This process will require the involvement of the property owner, Environmental Building Officer and Committee, Technical Advice bodies and an independent reviewer.

Communicating conformity

A building can be awarded either Gold, Silver or Bronze certificate. A plaque is also awarded which may be installed in the building.

Objectivity/impartiality

The validation is reviewed by independent specialists and auditors. This is a confidential process, with all communication between the property owners and reviewers via the administrators.

Extent of use of the scheme

By July 2013, 300 buildings had been certified. There are currently 206 companies and organisations that are members of the Sweden Green Building Council.

European Ecolabel

Introduction

The European Ecolabel is a voluntary scheme established in 1992 to encourage businesses to market products and services that are kinder to the environment.

Objectives of the scheme

The scheme intends to provide a trusted label which will help guide the decisions of consumers when choosing more environmentally friendly products.

[220] BATSA website: Environmental Certification Systems, accessed at http://www.bastaonline.se/english/bastaonline/aboutbasta/environmentalcertificationsystems.4.50367b6c13a6fda015210ab.html

Geographical coverage

The label is used throughout the European Union; Table A2-62 shows which countries the label is mostly used.

Table A2-62: Number of European Ecolabel products issued per country (January 2012)[221]	
Country	**No EU Ecolabel products**
Italy	9,067
France	3,839
United Kingdom	1,616
The Netherlands	663
Spain	599
Sweden	322
Germany	317
Other	1,331

Focus of the scheme (content vs. emissions)

Each product group has specific criteria, with content limits, prohibited substances and emission limits.

Products covered

The European Ecolabel covers 26 product categories; most of which are consumer products, with the exception of hard floor coverings, these include:

- hard floor coverings;
- indoor paints and varnishes;
- all-purpose cleaners and cleaners for sanitary facilities;
- tissue paper;
- textile products;
- copying and graphic paper;
- televisions;
- soaps and shampoos;
- hand dishwashing detergents;
- tourist accommodation; and
- laundry detergents.

Substances covered (including award criteria)

[221] European Commission website: Facts and Figures, accessed at http://ec.europa.eu/environment/ecolabel/facts-and-figures.html

Criteria for product groups are developed at the European level, with representatives of agencies from the various Ecolabels across Europe, as well as experts, industry and non-profit organisations. The criteria for each product group are ultimately defined by European directives and regulations. On average, the criteria are revised every four years to reflect technical innovation such as evolution of materials, production processes or emission reduction and changes in the market[222]. Following consultation with the European Union Eco-Labelling Board (EUEB), the Commission, Member States, Competent Bodies and other stakeholders may initiate and lead the development or revision of EU Eco-label criteria. The European Union Eco-Labelling Board are currently developing criteria for new products groups, these include water heating generators, taps and showers and toilets and urinals. Table A2-63 shows the content and emissions criteria for each of the construction product groups.

[222] European Commission website: The EU Ecolabel, access at http://ec.europa.eu/environment/ecolabel/

Table A2-63: Chemical content criteria under European Ecolabel[223]					
Product group	**Relates to**	**Raw material requirements according to DSD/CLP**	**Additional requirements regarding raw materials**	**Substances not permitted**	**Emissions requirements**
Hard floorings	Natural stones, concrete paving units, terrazzo tiles, ceramic tiles and clay tiles for indoor and outdoor use	R45, R46, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R68 H350, H340, H350i, H400, H410, H411, H412, H413, EUH059, H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df, H341	Lead – 0.5% of weight Cadmium – 0.1% of weight Antimony – 0.25% of weight Asbestos is not permitted Polyester resins must be limited to 10% of the total weight of raw materials		Emission limits for vitrified tiles: Lead Cadmium
Wood flooring	Wood siding, laminate flooring, cork and bamboo flooring that consist of more than 90% by weight (final product) of wood, wood meal or wood-based material	R23, R24, R25, R26, R27, R28, R39, R40, R42, R43, R45, R46, R48, R49, R50, R51, R52, R53, R60, R61, R62, R63, R68 H300, H301, H310, H311, H317 H330, H331, H334, H351, H350, H340, H350i, H400, H410, H411, H412, H413, H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df, H341, H370, H372	Content of recycled material (mg/kg): Arsenic – 25 Cadmium – 50 Chrome – 25 Copper – 40 Lead – 90 Mercury – 25 Fluoride 100 Chlorine 1000 Pentachlorophenol (PCP – 5	The following are not permitted: Halogenated organic compounds, aziridine or polyaziridines Lead, cadmium, chromium (VI), mercury and their compounds	Emission limits for: Formaldehyde TVOC SVOC VOC

[223] Ecolabels.fr website: Categories certified products or services, access at http://translate.google.co.uk/translate?hl=en&sl=fr&u=http://www.ecolabels.fr/fr/recherche-avancee/categories-de-produits-ou-services-certifies&prev=/search%3Fq%3Dhttp://www.ecolabels.fr/fr/recherche-avancee/categories-de-produits-ou-services-certifies%26biw%3D946%26bih%3D893

Table A2-63: Chemical content criteria under European Ecolabel[223]					
Product group	**Relates to**	**Raw material requirements according to DSD/CLP**	**Additional requirements regarding raw materials**	**Substances not permitted**	**Emissions requirements**
			Tar oil (Benzo(a)pyrene) – 0.5 Preserving treatments/adhesives must not contain extremely or highly hazardous substances listed on, up to 5% content of VOCs is permitted Formaldehyde is permitted within limits by % weight.	Arsenic, boron and copper Organic tin compounds	
Textile floor coverings	Floor coatings of a woven, knitted or tufted, usually with the use of nails, staples or adhesives	**Raw materials/feedstock:** R23, R24, R25, R26, R27, R28, R39, R40, R42, R43, R45, R46, R48, R49, R50, R51, R52, R53, R60, R61, R62, R63, R68 H300, H301, H310, H311, H317, H330, H331, H334, H351, H350, H340, H350i, H400, H410, H411, H412, H413, H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df, H341, H370, H372	**Wool treatments** - following substances must not exceed 0.5 ppm: Lindane, α, β, δ -hexachlorocyclohexane, Aldrine, Dieldrine, Endrine, DDT, DDD 2ppm: Propetamphos, Diazinon, Dichlofenthion, Fenchlorphos, Chlorpyriphos, Chlorfenvinphos, Ethion, Pyrimiphos-methyl 0.5 ppm: Cyhalothrine,	**Polypropylene** - Pigments must not contain lead **Foam rubber** - Organic tin compounds CFCs, HCFCs, HFCs or methylene chloride shall not be used **Colours/pigments** – 4-aminodiphényle, Benzidine, 4-chloro-o-	Emission limits for: TVOC SVOC VOC

Table A2-63: Chemical content criteria under European Ecolabel[223]					
Product group	**Relates to**	**Raw material requirements according to DSD/CLP**	**Additional requirements regarding raw materials**	**Substances not permitted**	**Emissions requirements**
		Flame retardants: R40, R45, R46, R49, R50, R51, R52, R53, R60, R61, R62, R63, R68 H350, H340, H350i, H400, H410, H411, H412, H413, H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df, H341 **Plasticisers** R50, R51, R52, R53, R60, R61, R62 H410, H411, H412, H413, H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df **Colours/pigments** R40, R45, R49, R60, R61, R62, R63, R68 H351, H350, H340, H350i, H360F,	Cybermethrine, Deltamethrine, Fenvalerate, Fluméthrine 2 ppm: Diflubenzuron, Triflumuron, Dicyclanile **Polyester** – amount of antimony must not exceed 260 ppm **Foam rubber** – the following apply if latex foam is more than 5% of total weight: Antiomny 0.5 ppm Cadmium 0.1 ppm Chrome 1 ppm Cobalt 0.5 ppm Copper 2 ppm Nickel 1 pm Mercury 0.02 ppm VOCs must not exceed 0.5mg/m3	toluidine, 2-naphthylamine, o-amino-azotoluene, 2-amino-4-nitrotoluène, p-chloroaniline, 2,4-diaminoanisol,4,4'-diaminodiphenylmethane, 3,3'-dichlorobenzidine, 3,3'-dimethoxybenzidine, 3,3'-dimethylbenzidine, 3,3’-diméthyl-4,4’-diaminodiphénylméthane, p-cresidine, 4,4'-oxydianiline, 4,4'-thiodianiline, o-toluidine, 2,4-diaminotoluène, ,4,5-triméthylaniline, 4-aminoazobenzène, o-anisidine, 2,4-xylidine, 2,6-xylidine	

Table A2-63: Chemical content criteria under European Ecolabel[223]					
Product group	**Relates to**	**Raw material requirements according to DSD/CLP**	**Additional requirements regarding raw materials**	**Substances not permitted**	**Emissions requirements**
		H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df, H341	Chlorophenols must nort exceed 0.1 ppm and di-cholorphenols 1 ppm Butadiene must not exceed 1 ppm Nitrosamines must not exceed 0.001mg/m3 Formaldehyde must not exceed 30 ppm	**Plasticisers** DNOP, DINP AND DIDP are not permitted Alkylphenolethoxylates (APEO), linear alkylbenzene sulfonates (LAS), chlorides diméthyldioctadécy lammonium (DTDMAC, DSDMAC, DHTDMAC), ethylene diamino tetraacetic acid (EDTA) and diethylenetriaminepenta acetic acid triaminopentaacétique (DTPA)	

Testing/assessment

The programme is governed by rules of the European Parliament and the European Council following the principle of international standard ISO 14024[224].

The applicant must provide a declaration of compliance with the criteria, together with a product material safety data sheets meeting the requirements of Annex II to the REACH Regulation.

Communicating conformity

Products and services awarded with the Ecolabel carry the flower logo, allowing consumers, including public and private purchasers, to identify them easily. Certified products are also published on the European Ecolabel website.

Objectivity/impartiality

Within each State of the European Economic Area a competent, independent body is designated in order to ensure an objective and impartial assessment.

Extent of use of the scheme

Since its development in 1992, the number of licenses issued each year has gradually increased, see Table A2-64

Table A2-64: Total number of licenses issued from 1992 to 2011[225]

Year	Number of Licenses
1992 - 1995	0
1996	6
1997	11
1998	33
1999	39
2000	53
2001	95
2002	128
2003	166
2004	224

[224] Cenia website: How eco-labelling works, accessed at http://translate.google.co.uk/translate?hl=en&sl=cs&u=http://www1.cenia.cz/www/ekoznaceni/jak-ekoznaceni-funguje&prev=/search%3Fq%3Dhttp://www1.cenia.cz/www/ekoznaceni/jak-ekoznaceni-funguje%2523narodniprogram%26biw%3D946%26bih%3D920

[225] EU Ecolabel website: Facts and Figures, accessed at http://ec.europa.eu/environment/ecolabel/facts-and-figures.html

2005	249
2006	386
2007	514
2008	754
2009	1,015
2010	1,064
2011	1,357

Since its development, the number of products and services awarded by the label has increased annually. By the end of 2011, more than 1,300 licences had been awarded, and today, the European Ecolabel can be found on more than 17,000 products. A licence gives a company the right to use the logo for a specific product group. The certified products have been categorised into CEN Mandates, which shows that only 35% of the products are construction products, see Table A2-65.

Table A2-65: Products certified under European Ecolabel[226]

Mandate	Type	Number of products	Products in scheme
M119	Floorings	6,250	Hard floor coverings (6,250)
N/A	Non-construction products	11,504	Indoor paints and varnishes (2,469), All-purpose cleaners and cleaners for sanitary facilities (2,115), Tissue paper (2,000), Textile products (1,367), Copying and graphic paper (724), Televisions (676), Soaps and shampoos (407), Hand dishwashing detergents (372), Tourist accommodation (356), Laundry detergents (264), Other (754)

Additional Information (Ecolabel Award Scheme for Buildings)

Materials used for the interiors (floor coverings, windows, doors, partitions, paint and varnishes, plasters etc.) shall not contain:

- substances or preparations/mixtures meeting the criteria for classification as toxic, hazardous to the environment, carcinogenic, mutagenic or toxic for reproduction (CMR), in accordance with Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures OJ L 353, 31.12.2008, p. 1.;
- substances referred to in Article 57 of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the

[226] European Commission website: Facts and Figures, accessed at http://ec.europa.eu/environment/ecolabel/facts-and-figures.html

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency OJ L 396, 30.12.2006, p. 1; and

- substances that meet the criteria of Article 57 of Regulation (EC) No 1907/2006 and that are identified according to the procedure described in Article 59 of that Regulation, present in mixtures, in an article or in any homogeneous part of a complex article in concentrations higher than 0,1 % (weight by weight)[227].

The draft criteria for the Ecolabel Award Scheme for Buildings states that "the VOC emissions from the building products used for interiors shall comply with the EN ISO 16000-9 to -11 standard[228].

At the mandate of the EU Eco-Labelling Board in 2007 the development of a product group "Buildings" was initiated and carried out a voluntary basis by the Italian Ecolabel Competent Body. At the moment, the Joint Research Centre Institute for Prospective Technological Studies (JRC-IPTS) of the European Commission is involved in the buildings criteria development work, with a Pilot study on developing an EU Ecolabel and Green Public Procurement (GPP) criteria for buildings.[229] The EU Ecolabel and GPP criteria for buildings will consist of environmental criteria based on scientific assessment studies of the environmental impacts of the building for each part of its life cycle (e.g. LCA studies) considering different environmental aspects such as air quality, water quality, soil protection, waste reduction, energy savings, natural resource management, GWP, ozone layer protection, environmental safety, noise and biodiversity. The draft criteria published by JRC-IPTS in June 2012[230] suggest that criteria relating to hazardous materials and substances in construction components may focus on compliance with REACH and CLP regulations, verified by means of the applicant providing certain information on the content of their products.

Ecolabel (Austria)

Introduction

[227] IBO (2011): Environmental and health related criteria for buildings, accessed at http://www.anec.eu/attachments/ANEC-R&T-2011-ENV-001final.pdf

[228] IBO (2011): Environmental and health related criteria for buildings, accessed at http://www.anec.eu/attachments/ANEC-R&T-2011-ENV-001final.pdf

[229] European commission website: EU Ecolabel and Green Public Procurement for Buildings, accessed at http://susproc.jrc.ec.europa.eu/buildings/

[230] European Commission website: accessed at http://susproc.jrc.ec.europa.eu/buildings/docs/WP-3draft%20OFFICE%20 BUILDING.pdf

The Austrian Ecolabel is a voluntary label, primarily aimed towards consumers, allowing them to identify environmentally friendly and sustainable products and services.

Objectives of the scheme

The scheme encourages businesses to produce products and services that have fewer environmental impacts than products with the same or similar purpose. The target audience of this scheme includes both consumers and professionals[231].

Geographical coverage

This is a national scheme which is used predominantly in Austria; however, companies from neighbouring countries (Germany, Slovenia and Switzerland) have applied for licences[232].

Focus of the scheme (content vs. emissions)

There are specific criteria for each product group, these tend to have content based criteria and some also have emission limits.

Products covered

The Austrian Ecolabel is applicable to different product groups, these are listed below:

- building and living products;
- office and print;
- renewable energy and energy efficiency;
- garden and garden products;
- home;
- mobility;
- schools and educational institutions; and
- tourism and gastronomy.

The construction products group covers flooring, insulation, wood products, biomass stoves and plastic pipes. The Austrian Ecolabel intends to develop criteria for additional construction products in the future[233].

Substances covered (including award criteria)

Products are subject to a Life Cycle Assessment which encompasses the following points:

[231] Pers. Comm. 2013
[232] Pers. Comm. 2013
[233] Pers. Comm. 2013

- consumption of raw materials and energy;
- toxicity of ingredients;
- emissions (e.g. exhaust gases, sewage, noise);
- disposal/recycling (wastes, suitability for recycling);
- packaging;
- distribution and transportation; and
- quality, safety, longevity and ease of repair[234].

There are specific certification criteria for each product group, Table A2-66 details the criteria for the construction product groups identified. Criteria are developed by an expert committee under the chairmanship of the Association of the Consumer Association.

[234] The Austrian Eco-label (2012): The Austrian Eco-label, accessed at http://www.umweltzeichen.at/cms/upload/20%20docs/2013/uz-fibel_englisch_jaenner_2013.pdf

Table A2-66: Health and environmental criteria for construction product groups under Austrian Ecolabel[235]				
Product group	**Relates to**	**General content rules for raw materials according to DSD (CLP)**	**Specific content provisions for raw materials**	**Emission requireme**
Flooring	Resilient floor coverings, floor panels for loose laying, textile floor coverings, wood flooring and laminate flooring	**Very Toxic:** R26, R27, R28 (H300, H310, H330), R39/26, R39/27, R39/28 (H370) **Toxic:** R23, R24, R25 (H301, H331, H311), R39/23, R39/24, R39/25 (H370), R48/23, R48/24, R48/25 (H372) **Carcinogenic (Carcinogencity)**: Cat. 1, 2: R45, R49 (Cat 1A, 1B: H350, H350i), Cat.3: R40 (Cat 2: H351) **Mutagen (Germ cell mutagenicity):** Cat. 1, 2: R46 (Cat 1A, 1B: H340), Cat. 3: R68 (Cat 2: H341) **Toxic for reproduction**: Cat. 1, 2: R60, R61 (Cat 1A, 1B: H360F, H360D, H360, H360Fd, H360Df), Cat. 3: R62, R63 (Cat 2: H361f, H361d, H361fd), Additional Lactation: R64 (Toxic to reproduction or via lactation: H362) **Dangerous for the environment (Environmental hazards):** R50 (Acute: H400), R50/53 (Chronic Category 1: H410), R51/53 (Chronic Category 2: H411), R59 (The ozone layer: EUH 059)	The following are prohibited: • lead, arsenic, cadmium, mercury, chromium VI and their compounds; • halogenated organic compounds (such as a binder, flame retardant); • plasticisers; • fungicides; • bactericidal; • azo dyes which can release carcinogenic aromatic amines; • pentachlorophenol; • hazardous pesticides under GuT; • aromatic hydrocarbons; and • cobalt compounds.	Emission limits for th following: • formaldehy • TVOC; • SVOC; and • VOC withou
Insulation boards from	Thermal panels made from raw materials	Same as flooring	Following flame retardants are not permitted: • halogenated biphenyls, terphenyls,	

[235] The Austrian Ecolabel website: Guidelines, accessed at http://translate.google.co.uk/translate?hl=en&sl=de&u=http://www.umweltzeichen.at/&prev=/search%3Fq%3Daustrian%2Beco%2Blabel%26client%3Dfirefox-a%26rls%3Dorg.mozilla:en-US:official%26channel%3Dnp%26biw%3D946%26bih%3D893

Table A2-66: Health and environmental criteria for construction product groups under Austrian Ecolabel[235]				
Product group	**Relates to**	**General content rules for raw materials according to DSD (CLP)**	**Specific content provisions for raw materials**	**Emission requireme**
fossil fuels	derived from fossil fuels		naphthalenes and diphenylmethanes; • brominated diphenyl ethers; and • halogenated organic compounds are banned as propellants.	
Wood and wood products	The following wood products are covered (with the exception of cement-bonded wood materials): Solid wood panels, laminated veneer lumber, plywood, OSB, resin bonded particle board, fibreboard by the wet method, MDF	Same as flooring	Following flame retardants are not permitted: • Halogenated organic compounds (such as a binder, flame retardant. The following surface treatments or coatings are not permitted: • aromatic hydrocarbons; • compounds containing arsenic, lead, cadmium, chromium VI, mercury and other toxic heavy metals; • cobalt compounds; • phthalates; and • biocides.	Emission limits for th following: • formaldehy • phenolic binders; • polymeric M binders; • TVOC; and • SVOC.
Wood heating	Automatic or manually fed room heaters and boilers	None – criteria relate to fuel selection, efficiency and emissions during use.	Following are not permitted: • halogenated polymers.	
Sewer pipes made of plastic	Plastic piping systems for drains and sewers, including	Same as flooring	Following are not permitted: • halogenated organic compounds (flame retardant);	

Table A2-66: Health and environmental criteria for construction product groups under Austrian Ecolabel[235]				
Product group	**Relates to**	**General content rules for raw materials according to DSD (CLP)**	**Specific content provisions for raw materials**	**Emission requireme**
	pipes and fittings including seals		• plasticisers; • lead, cadmium, chromium VI and their compounds; and • the use of polymers should be kept to a minimum bearing in mind the intended application.	
Mineral-bound construction	Semi-finished and finished products to be permanently installed in a building, including bricks, prefabricated elements and fibreboard	Same as flooring	Maximum allowable chlorine impurities – 0.002 mass% If cement or cement-containing preparations are used during production the following applies: • requirements of Gazette No. 158 must be met; • cement shall comply with requirements of ÖNORM EN 197-1 [9]; • content of soluble chromium VI must be less than 2ppm; and • mixing water shall comply with the requirements of ÖNORM EN 1008 [10].	
Mineral thermal insulation	Insulation materials made of mineral raw materials, excluding fibrous insulation	**Carcinogenic (Carcinogencity)**: Cat. 1, 2: R45, R49 (Cat 1A, 1B: H350, H350i) Cat.3: R40 (Cat 2: H351) **Mutagen (Germ cell mutagenicity):**	Following are not permitted : • lead glass.	

Table A2-66: Health and environmental criteria for construction product groups under Austrian Ecolabel[235]				
Product group	**Relates to**	**General content rules for raw materials according to DSD (CLP)**	**Specific content provisions for raw materials**	**Emission requireme**
	materials	Cat. 1, 2: R46 (Cat 1A, 1B: H340) Cat. 3: R68 (Cat 2: H341) **Toxic for reproduction**: Cat. 1, 2: R60, R61 (Cat 1A, 1B: H360F, H360D, H360, H360Fd, H360Df) Cat. 3: R62, R63 (Cat 2: H361f, H361d, H361fd) Additional Lactation: R64 (Toxic to reproduction or via lactation: H362)		
Thermal insulation made from renewable resources	Thermal insulation made from renewable raw materials (at least 75% by mass)	Same as flooring	Limits relating to boron compounds (Boric acid, sodium borate, borax pentahydrate and boraxdekahydrat)	

Testing/assessment

Products are inspected by an independent accredited testing body and if the requirements are met the products are awarded the label by the Environment Ministry (BMLFUW), which is valid for four years, after which the product must be re-tested.

Communicating conformity

Certified products are published on the Austrian Ecolabel website and authorised to use the logo on products.

Objectivity/impartiality

No information has been identified.

Extent of use of the scheme

Currently, around 40 manufacturers of construction products hold licences for products that are within the scope of the CPR; however, some licences certify more than one product. On average, five construction products are certified each year[236]. The market share of certified products differs by product group; it is quite large in the flooring and insulation segments but lower in other market segments[237].

Certified products are published on the scheme's website, these have been categorised into the CEN Mandates, Table A2-67. The scheme is predominantly aimed towards consumers and therefore only 20% of the 301 products are construction products.

Table A2-67: Products certified under Austrian Ecolabel[238]

Mandate	Type	Number of products	Products in scheme
M103	Thermal insulating products	20	Rigid foam insulation boards from fossil fuels, Mineral thermal insulation, Thermal insulation made from renewable resources
M106	Gypsum	3	Mineral bonded construction
M113	Structural timber products and ancillaries	10	Wood and wood based materials

[236] Pers. Comm. 2013
[237] Pers. Comm. 2013
[238] The Austrian Ecolabel website: Products, accessed at http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=/search%3Fq%3D%25C3%25B6sterreichisches%2Bumweltzeichen%26biw%3D946%26bih%3D920&rurl=translate.google.co.uk&sl=de&u=http://www.umweltzeichen.at/cms/home/produkte/content.html&usg=ALkJrhjT9az0Ptpvr7FwsZ29XgTTXFWXxA

Table A2-67: Products certified under Austrian Ecolabel[238]			
Mandate	**Type**	**Number of products**	**Products in scheme**
M119	Floorings	71	Flooring
M131	Pipes, tanks NOT in contact DW	2	
N/A	Non-construction products	240	All-purpose cleaners and sanitary cleaners (15), Printed matter (107), Low-emission upholstered furniture (11), Furniture (12), Peat-free growing media and soil improvers (10), Wall colours (16)[239]

El distintiu (the Catalonian Eco-label)[240]

Introduction

El Distintiu is a scheme controlled by the Department of Planning and Sustainability and the Directorate General of Environmnetal Quality of Catalonia, Spain. The scheme identifies those products and services which have properties or features that are more environmentally friendly. The use is restricted to those products and services that have been voluntarily submitted by producers, traders and owners.

Objectives of the scheme

The objectives of El Distintiu are:

- to enhance the design, production, marketing, use and consumption of products and services which promote waste minimisation or recovery and reuse of by-products, materials and substances; and
- to provide users and consumers with better and more reliable information on the environmental quality of products and services, to guide them in their decisions to use or purchase.

Geographical coverage

Applicants may only be manufacturers with industrial facilities in Catalonia, distributors of products sold in Catalonia and holders of services provided in the territory of Catalonia.

[239] For conciseness only products types with 10 or more products have been included

[240] Information obtained via direct telephone contact and http://www20.gencat.cat/portal/site/mediambient/menuitem.113a167779e5c8e16f51ec10b0c0e1a0/?vgnextoid=14b35c411dd47210VgnVCM1000008d0c1e0aRCRD&vgnextchannel=14b35c411dd47210VgnVCM1000008d0c1e0aRCRD&vgnextfmt=default

Therefore the geographical extent of the scheme is almost restricted to Catalonia and neighboring areas.

Focus of the scheme (content vs. emissions)

In general the scheme focuses on controlling the content of dangerous substances. In order for products to be awarded the label they must avoid the use of substances or mixtures classified as toxic or toxic for reproduction according to REACH and CLP (Classification, Labeling and Packaging) regulations. Substances included in Article 57 of REACH regulation must also be avoided. General exceptions might be envisaged in cases where it is not technically feasible to eliminate these substances. The exceptions (not limited to the ones considered in the EU Ecolabel) are assessed on a case by case basis by an expert panel. Content of volatile organic compounds (VOCs) in products or part of the products (as coating systems) is also considered for some product types.

Products covered

The scheme covers a range of products, with 32 product categories, of which 11 are related directly or indirectly to construction products, these include:

- concrete products;
- sanitary appliances;
- masonry;
- road construction products;
- screeds, mortar and grout; and
- buildings.

Substances covered (including award criteria)[241]

Each product/service category has its own set of criteria that is published in the Official Journal of the Government of Catalonia and is available on their webpage.

In general the criteria used to certify materials include:

- compliance with environmental legislation: this must be supported by documentation which shows that each production step is compliant;
- content of toxic substances: quantitative composition and security data sheets of each substance should be presented. Toxic substance definition is taken from European (REACH, CLP), national or local legislation. Heavy metals are also

[241] See http://www20.gencat.cat/portal/site/mediambient/menuitem.718bbc75771059204e9cac3bb0c0e1a0/?vgnextoid=eb36e9671588d310VgnVCM1000008d0c1e0aRCRD&vgnextchannel=eb36e9671588d310VgnVCM1000008d0c1e0aRCRD&vgnextfmt=default

considered. VOC content on the product or parts of the product (as coverings) is also evaluated;

- usability of the product: the product must comply with requirements that ensure security and adequacy for use (for instance requirements to use the CE mark for construction products);
- amount of recycled material and/or source of the material used;
- quality of information given to customers and consumers;
- packaging system has to be considered in order to reduce waste production through packaging disposal; and
- additional environmental criteria specific to each product category.

In some cases and for some materials, emissions are also considered (together with conditions under which emissions might occur). This is the case of formaldehyde emissions from some wood products.

New categories and criteria can be initiated by any involved stakeholder, from producers to the Government of Catalonia. The proposal is evaluated by the Council on Environmental Quality, who consults with the main stakeholders involved and determines the qualitative and quantitative specifications to be met by products or services. Finally the Director General of Environmental Quality adopts the categories of products or services and the criteria defined by the Council on Environmental Quality. Afterwards this is published in the Official Journal of the Government of Catalonia.

Testing/assessment

As a minimum requirement applicants must provide safety data sheets for those substances and preparations that might be considered dangerous. The conformity assessment is carried out by checking the documentation regarding the manufacturing processes, as declared by the applicant.

The application process consists of the following steps:

- the application and accompanying documentation is submitted to the Directorate General of Environmental Quality;
- the application is evaluated by technical staff who perform the necessary checks to ascertain compliance with the ecological criteria relevant for the category; and
- the Environmental Quality Council validates the assessment.

Communicating conformity

The award of the Distinction authorises the use of the logo with certified products, services and firms showing the mark of Environmental Quality. The logo must specify the property or characteristic of the product or service that meets the environmental requirements and the relevant criteria as a legend.

Objectivity/impartiality

Applications are evaluated by technical staff and the Environmental Quality Council validates the assessment.

Extent of use of the scheme[242]

Certified products are published on the scheme's website and have been classified into CEN mandates below. There are 866 products, 79% of them are construction products.

Table A2-68: Products certified under El Distintiu

Mandate	Type	Number of products	Products in scheme
M100	Precast concrete products	8	Concrete blocks made with recycled arids (6); other concrete products made with recycled acids (2)
M110	Sanitary appliances	642	Toilet seats made of raw materials and/or recycled plastics (1 firm 15 products); shower parts (20); taps equipped with a thermostatic mixer (10); other taps (105); flow reduction pieces (38); other systems favouring water savings (454)
M116	Masonry	3	Masonry products with recycled arid (3)
M124	Road construction products	5	Lane borders made of raw materials and/or recycled plastics (1 firm 2 models); Bus platform made of raw materials and/or recycled plastics (1); Traffic acoustic screens (2)
M128	Concrete, mortar & grout	7	Concrete with recycled arid products (3); concrete mixtures with recycled arids (4)
N/A	Other construction products	15	Garden Boundaries made of raw materials and/or recycled plastics (1); recycled plastic profiles (1); wood fences (4); wood benches (2); wood tables (2); other wood structures (5)
N/A	Non-construction	186	Paper products (27); Recycled cardboard and

[242] AENOR website: Certicacion, accessed at http://www.aenor.es/aenor/certificacion/buscador/buscador.asp#.Ud_z_tL0GSo

Table A2-68: Products certified under El Distintiu			
Mandate	Type	Number of products	Products in scheme
	products		paperboard products (4); Camp sites (11); Compostable bags and containers (6); Service Stations (19); youth accommodation (32); Hotels (14); Rural houses (44); wood products (1); Recycled rubber (22); others (6)

Ecolabel (Croatia)

Introduction

The Environmentally Friendly Label (Croatia) is a voluntary scheme which is awarded to products or services which have a lower environmental impact compared to other products with the same or similar purpose. The Blue Angel scheme has been used as a guide to the establishment and awarding of the label.

Objectives of the scheme

The underlying objective of the label is to promote products that have a reduced environmental impact when compared to other equivalent products

Geographical coverage

This is a national schemes used primarily in Croatia.

Focus of the scheme (content vs. emissions)

The product group criteria are mostly concerned with the content of chemicals, with thresholds and prohibited substances. These criteria also include emission limits where these are likely.

Products covered

The scheme primarily focuses on product groups which have the potential to cause more environmental damage and therefore promotes the development of alternatives which have a reduced impact. Product groups have been chosen so that products with a similar function and purpose are included in the same group. The scheme covers the following product groups:

- packaging;
- wood flooring;

- wood furniture;
- products made from recycled material (various);
- free products;
- toner cartridges;
- paint and varnishes (waster based);
- adhesives (water based); and
- thermal insulation.

Substances covered (including award criteria)

The label will not be awarded to products which:

- contain substances and preparations which are classified as very toxic, toxic, dangerous to the environment, carcinogenic, toxic for reproduction or mutagenic; and
- are manufactured by processes which are likely to significantly harm man and/or the environment, or in their normal application could be harmful to consumers[243].

Exceptions may be made to products which contain hazardous substances but are at a concentration which does not pose a threat to human health or the environment. Table A2-69 below details the criteria for the construction product groups, although at present only one manufacturer has been awarded the label.

[243] Ministry of Environment, Physical Planning website: Ordinance – Environmental Label, accessed at http://translate.google.co.uk/translate?hl=en&sl=hr&u=http://www.mzoip.hr/default.aspx%3Fid%3D5396&prev=/search%3Fq%3Dhttp://www.mzoip.hr/default.aspx%253Fid%253D5396%26biw%3D946%26bih%3D893

Table A2-69: Chemical content criteria for Environmentally Friendly Label (Croatia)[244]				
Product group	**Relates to**	**Raw materials requirements according to DSD/CLP**	**Additional requirements regarding raw materials**	**Emissions requirements**
Wood flooring	Lining of the treated or untreated wood for flooring or wall made of one solid piece of wood with couplings (wedges and slots) with the or some of the layers of wood glued together	R24, R25, R26, R27, R28, R39, R40, R42, R43, R45, R46, R48, R49, R50, R51, R52, R53, R60, R61, R62, R63, R68 H300, H301, H310, H311, H317, H330, H331, H334, H351, H350, H340, H350i, H400, H410, H411, H412, H413, H360F, H360D, H361f, H361d, H360FD, H361fd, H360FD, H360Df, H341, H370, H372	Preservatives - Wood intended for indoor use will not be impregnated. Treatments must not include: Pesticides that are classified as extremely hazardous (Class 1A) or very dangerous (Class 1B) according to the WHO. The Law on chemicals (Official Gazette 150/05, 53/08 and 49/11) must also be adhered to. Products must not contain: Halogenated organic compounds, aziridine (ethylene amine), poliaziridon nor dyes, lead, cadmium, chromium VI, mercury and their compounds, arsenic, boron, copper and organic tin. Products may contain: VOCs – 5% Formaldehyde in products or preparation – 0.3% Formaldehyde in binders, sealants and adhesives 0.5%	Limits for emissions of: Formaldehyde VOCs
Adhesives (water based)	Flooring		The following restrictions apply: No organochlorine or nitrogen compounds	

[244] Ministry of Environmental and Nature Protection website: Benchmarks, accessed at http://translate.google.co.uk/translate?hl=en&sl=hr&u=http://www.mzoip.hr/default.aspx%3Fid%3D5396&prev=/search%3Fq%3Dhttp://www.mzoip.hr/default.aspx%253Fid%253D5396%26biw%3D946%26bih%3D893

Table A2-69: Chemical content criteria for Environmentally Friendly Label (Croatia)[244]				
Product group	**Relates to**	**Raw materials requirements according to DSD/CLP**	**Additional requirements regarding raw materials**	**Emissions requirements**
			No VOCs with the exception of ethanol (up to 2%) Fungacidal agents up to 0.5% Biocides up to 0.1% No substances classified as carcinogenic, mutagenic or tetragenic	
Thermal insulation (rock wool)	Used for thin façade systems			Emission limits for formaldehyde in the workplace

Testing/assessment

The assessment and award is carried out by a committee appointed by the Environment Minister, who is also authorised to award the EU Ecolabel which has similar requirements. The label is awarded for three years, after which time the manufacturer may choose to re-submit a new request for extension of the right to display the label on products.

Communicating conformity

Products are published on the Ministry of Environmental and Nature Protection website and are authorised to use the logo subject to terms of use.

Objectivity/impartiality

The criteria and testing assessment comply with ISO 14040 and 14024.

Extent of use of the scheme

Of the certified products under the scheme, only 1 is classified as a construction product; see Table A2-70 below.

Table A2-70: Products certified under Environmentally Friendly Label (Croatia)[245]

Mandate	Title	Number of products	Products in scheme
M103	Thermal insulating products	1	Thermal insulation (1)
N/A	Non-construction products	11	Refill toner cartridges (2), Cat litter (1), Synthetic lubricant (4), Packaging (3), Devices for mixing colours (industrial) (1)

Ecolabel (Czech Republic[246])

Introduction

In 1994 the Minister of Environment and the Minister of Industry and Trade introduced the Environmentally Friendly Product Label (Czech Republic), known today as the National

[245] Ministry of Environmental and Nature Protection website: List of products that have a sign of environmental protection, accessed at http://translate.google.co.uk/translate?hl=en&sl=hr&u=http://www.mzoip.hr/default.aspx%3Fid%3D5396&prev=/search%3Fq%3Dhttp://www.mzoip.hr/default.aspx%253Fid%253D5396%26biw%3D946%26bih%3D893

[246] Ekologicky setrny vyrobek

Programme for Labelling Environmentally Friendly Products and Services[247]. Following accession to the EU the Czech Environmental Information Agency (Cenia) can also award the EU Ecolabel[248].

Objectives of the scheme

The label encourages the uptake of products with a reduced impact compared with products with the same or similar function.

Geographical coverage

National scheme developed for use in the Czech Republic market.

Focus of the scheme (content vs. emissions)

There are specific criteria for each product group; these include content limits, prohibited materials and emission limits.

Products covered

There are currently 37 product groups within the scheme, these include:

[247] Cenia website: How eco-labelling works, accessed at http://translate.google.co.uk/translate?hl=en&sl=cs&u=http://www1.cenia.cz/www/ekoznaceni/jak-ekoznaceni-funguje&prev=/search%3Fq%3Dhttp://www1.cenia.cz/www/ekoznaceni/jak-ekoznaceni-funguje%2523narodniprogram%26biw%3D946%26bih%3D920

[248] Cenia website: How eco-labelling works, accessed at http://translate.google.co.uk/translate?hl=en&sl=cs&u=http://www1.cenia.cz/www/ekoznaceni/jak-ekoznaceni-funguje&prev=/search%3Fq%3Dhttp://www1.cenia.cz/www/ekoznaceni/jak-ekoznaceni-funguje%2523narodniprogram%26biw%3D946%26bih%3D920

- absorbants;
- accommodation services for tourists;
- adhesives and sealants (water soluble);
- cardboard and paperboard products, printed paper and mulch made from recycled paper;
- cleaning and washing products and detergents;
- aggregates;
- furniture;
- hardwood flooring;
- office and administrative services;
- paper bags and shopping bags;
- plastic pipes;
- textile products;
- thermal insulation made from recycled paper;
- water soluble paints; and
- wood and gas burning boilers.

Substances covered (including award criteria)

Products with the Czech Ecolabel must meet product specific criteria that are formulated by Cenia in co-operation with relevant experts. Criteria relate to the impact of the product on the environment throughout its life cycle, from raw material extraction, through production and use of the product to its demolition and final disposal.

Certified products must not contain chemicals classified as highly toxic, toxic, dangerous to the environment, carcinogenic, mutagenic and toxic for reproduction. Whilst the Czech Ecolabel and EU Ecolabel are independent, there are efforts to harmonise the criteria under Article 11 of the EU Ecolabel Regulation.

Table A2-71 below, shows the criteria that applies to each of the construction product groups.

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
Thermal insulating products	Insulating materials made of cellulose-based fibres derived entirely of recycled paper	Law No. 86/2002 Coll., The Air Protection, as amended Law No. 20/2004 Coll. Amending Act No. 254/2001 Coll., On water and on amendments to certain Acts (Water Act), as amended Act No. 188/2004 Coll. Amending Act No. 185/2001 Coll., On waste and amending certain other laws, as amended Act No. 356/2003 Coll., On chemical substances and chemical preparations, as amended (the full text of the promulgation of Law No. 440/2008 Coll.) Law No. 20/1966 Coll., On Health Care, as amended Act No. 477/2001 Coll., On packaging and amending certain laws (the packaging)	None	None	None

[249] Cenia website: Environmentally Friendly Product, accessed at http://translate.google.co.uk/translate?hl=en&sl=cs&u=http://www1.cenia.cz/www/ekoznaceni/seznam-esv&prev=/search%3Fq%3Dhttp://www1.cenia.cz/www/ekoznaceni/seznam-esv%26hl%3Den%26biw%3D946%26bih%3D893

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
Adhesives and sealants (water based)	All water based adhesives and sealants	Law No. 22/1997 Coll., On technical requirements for products and on amendments to certain Acts, as amended, and related Government Regulation No. 163/2002 Coll. laying technical requirements for selected construction products, as amended Law No. 86/2002 Coll., The Air Protection, as amended Law No. 20/2004 Coll. Amending Act No. 254/2001 Coll., On water and on amendments to certain Acts (Water Act), as amended Act No. 188/2004 Coll. Amending Act No. 185/2001 Coll., On waste and amending certain other laws, as amended Act No. 356/2003 Coll., On chemical substances and chemical preparations and amending certain Acts, as amended Act No. 634/1992 Coll., Consumer Protection, as amended	R23, R24, R25, R26, R27, R28, R39, R45, R46, R48, R60, R61 Preservatives may contain substances marked with the following R-phrases but shall not exceed 0.1wt%: R23, R24, R25, R26, R27, R28, R39, R48	The following limits apply: VOCs must not exceed 5% Halogenated solvents must not exceed 0.1% weight Aromatic solvents must not exceed 0.1% weight Free formaldehyde must not exceed 10mg in 1 kg of product Heavy metals: Mercury – 60mg Lead – 90mg Cadmium – 75mg Barium – 500mg Antimony – 60mg Chromium VI – 60mg	None

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
Wood based materials	Agglomerated wood-based materials, including particleboard, fibreboard, uncoated boards (also applied to wooden furniture)	Law No. 22/1997 Coll., on technical requirements for products and on amendments to certain Acts, as amended, and related Government Regulation No. 163/2002 Coll. laying technical requirements for selected construction products, as amended by Government Regulation No. 312/2005, Coll. Law No. 86/2002 Coll., the Air Protection, as amended Act No. 254/2001 Coll. waters, as amended Act No. 185/2001 Coll., on waste, as amended Act No. 356/2003 Coll., on chemical substances and chemical preparations and amending certain Laws, as amended, and related regulations Act No. 634/1992 Coll., Consumer Protection, as amended	None		Limits for formaldehyde
Pipes, fittings and piping systems of	Pipes, fittings and piping systems designed for pressure	Law No. 86/2002 Coll., The Air Protection, as amended Act No. 254/2001 Coll. Waters, as amended	None	The following shall not be used: Halogen organic compounds Plasticisers	None

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
polyolefins	distribution of heating gas, water, heating and non-pressure application buried piping	Act No. 185/2001 Coll., On waste, as amended Act No. 350/2011 Coll., On chemical substances and mixtures, and amending certain Laws (D) Act No. 634/1992 Coll., Consumer Protection, as amended		Lead, cadmium, chromium and their compounds Substances very toxic or toxic pursuant to Act No. 356/2003	
Abrasive fill materials of lightweight aggregate for winter road maintenance	Aggregates with a porous structure, bulk density to 1,200kg/m and density of grains to 2,000kg/m with the purpose of increasing friction on icy or hard-packed snow on roads.	Law No. 86/2002 Coll., The Air Protection, as amended Act No. 254/2001 on the waters, as amended Act No. 185/2001 Coll., On waste, as amended	None	No toxic or highly toxic substances are permitted	Limits for leaching of pollutants, including ammonium and heavy metals
Heat pumps	Air conditioners, liquid chilling packages and heat pumps with	Law No. 86/2002 Coll., The Air Protection, as amended Act No. 254/2001 Coll. Waters, as amended	None	Limits relating to the following: Cadmium Lead Mercury	

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
	electrically driven compressors for space heating and cooling.	Act No. 185/2001 Coll., On waste, as amended Act No. 102/2001 Coll., On general product safety and on amendments to certain laws Act No. 634/1992 Coll., Consumer Protection, as amended Act No. 350/2011 Coll., On chemical substances and mixtures, and amending certain Acts (D) Act No. 258/2000 Coll., The protection of public health and amending certain related acts, amended		Chromium VI Flame retardants (polybrominated biphenyls or polybrominated diphenyl ethers)	
Boilers and heaters	Boilers, indoor heaters and biomass boilers.	Law No. 22/1997 Coll., On technical requirements for products and on amendments to certain Acts, as amended, and related government regulation, as No. 22/2003 Coll., which the technical requirements for appliances burning gaseous fuels, or Government Regulation No. 25/2003 Coll. establishing technical efficiency requirements for new hot-water boilers, Law No. 86/2002 Coll., The Air Protection, as amended Act No. 254/2001 Coll. Waters, as amended			

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
		Act No. 185/2001 Coll., On waste, as amended Act No. 634/1992 Coll., Consumer Protection, as amended Government Regulation No. 163/2002 Coll. Laying down technical requirements for selected construction products, as amended (Government Regulation No. 312/2005 Coll.) Government Regulation No. 190/2002 Coll. Laying down technical requirements for construction products CE marking, as amended (Government Regulation No. 251/2003, respectively. 128/2004 Coll.) Government Regulation No. 146/2007 Coll. Emission limits and other conditions for the operation stationary combustion sources of air pollution, Technical standards EN, which are listed in Article 2 of the definition of categories.			

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
Textile floor coverings	Floor coverings, usually of woven, knitted or tufted fabric. It does not cover loose mats and rugs	Law No. 86/2002 Coll., The Air Protection, as amended Act No. 254/2001 Coll. Waters, as amended Act No. 185/2001 Coll., On waste, as amended Act No. 356/2003 Coll., On chemical substances and chemical preparations and amending certain laws, as amended Act No. 102/2001 Coll., On general product safety and on amendments to certain laws Act No. 634/1992 Coll., Consumer Protection, as amended	**Raw materials** shall not contain substances or preperations whiuch can be assigned the following risk phrases: R23, R24, R25, R26, R27, R28, R39, R40, R42, R43, R45, R46, R48, R49, R50, R51, R52, R53, R60, R61, R62, R63 and R68. **Flame retardents** shall not contain substances or preperations whiuch can be assigned the following risk phrases: R40, R45, R46, R49, R50, R51, R52, R53, R60, R61, R62, R63 and R68 **Plasticisers** shall not contain substances or preperations whiuch can be assigned the following	**Wool processing** Content of the following shall not exceed 0.5ppm: γ-hexachlorocyclohexane (lindane) α-hexachlorocyclohexane β-hexachlorocyclohexane hexachlorocyclohexane Aldrin Dieldrin Endrin p, p'-DDT p, p'-DDD Content of the following shall not exceed 2ppm: Propetamphos Diazinon Dichlofenthion Fenchlorphos Chlorpyrifos Chlorfenvinphos Ethion Pirimiphos-methyl Content of the following shall	**Polyester** VOC limits during polymerisation and production of polymer fibres **Polypropylene** NO_x and SO_2 limits during production

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
			risk phrases: R50, R51, R52, R53, R60, R61 and R62. **Dyes** shall not contain substances or preperations whiuch can be assigned the following risk phrases: R40, R45, R46, R49, R60, R61, R62, R63 and R63.	not exceed 0.5ppm: Cyhalothrin Cybermetrin Deltamethrin Fenvalerate Flumetrin Content of the following shall not exceed 2ppm: Diflubenzuron Triflumuron Dicyclanil **Polyester** Antimony must not exceed 260ppm **Poypropylene** Lead-based pigments are not permitted **Foam rubber (natural and synthetic latex and polyurethane)**	

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
				If exceeds > 5% of total weight further metal limits apply Foam rubber (polyurethane only) Organic tin is not permitted **Vucanised foam** is not permitted for coatings Limits for **formaldehyde** content **Dyes** Azo dyes which cleave to aromatic amines are not permitted Dyes that sensitise are not permitted Dyes must not include heavy metals	
Wooden	Wood and	Law No. 86/2002 Coll., The Air Protection, as	**Hazardous substamces for**	**Recycled material from wood**	Limits for

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
flooring	timber, laminate flooring, cork flooring and bamboo floor covering.	amended Act No. 254/2001 Coll. Waters, as amended Act No. 185/2001 Coll., On waste, as amended Act No. 356/2003 Coll., On chemical substances and chemical preparations and amending certain laws, as amended Act No. 102/2001 Coll., On general product safety and on amendments to certain laws Act No. 634/1992 Coll., Consumer Protection, as amended	**the treatment of raw wood and plant** shall not contain substances or preperations whiuch can be assigned the following risk phrases: R23, R24, R25, R26, R27, R28, R39, R40, R42, R43, R45, R46, R48, R49, R50, R51, R52, R53, R60, R61, R62, R63 and R68.	**and plants (laminate and multilayer wood flooring)** Limts for the following: Arsenic Cadmium Chrome Copper Lead Mercury Fluor Chlorine Pentachlorophenol (PCP) Tar oils (benzo (a) pyrene Products must not contain halogenated organic binders and azidirin polyazidrin and pigments and additives derived from: Lead, cadmium, chromium (VI), mercury and their compounds Arsenic, boron and copper Organic tin VOC and formaldehyde limits	formaldehyde emissions

Table A2-71: Construction product group content criteria under Environmentally Friendly Product Label (Czech Republic) [249]					
Product type	**Relates to**	**Basic requirements**	**Raw material/feedstock requirements for DSD/CLP**	**Other requirements**	**Emissions requirements**
				for adhesives. Limits for plasticisers, including phthalates and biocides.	

Testing/assessment

When applying for the label the manufacturer must provide:

- written declaration which demonstrates the type of product and its utility properties;
- written declaration of conformity with technical regulations and compliance with established procedure conformity assessment;
- composition of the product and safety data sheets of individual components;
- confirmation of administrative proceedings for violations of legal regulations; and
- declaration of compliance with environmental principles in the production of the product[250].

Applicants are required to use accredited laboratories (ISO 17025 or equivalent) when testing products.

Applications are assessed by the Agency for Environmentally Friendly Products and Services, whilst expert advice is provided by the Council for Environmentally Friendly Products (now Council for Voluntary Instruments)[251].

Products remain certified for three years, after which time they will need to be re-tested.

Communicating conformity

Products awarded the label are published on the Czech Environmental Information Agency website and are permitted to display the logo subject to terms of use.

Objectivity/impartiality

The scheme is administered by the Czech Environmental Information Agency (Cenia). EPDs are used to ensure information supplied by applicants is objective, credible and neutral; this information is obtained by Life Cycle Analysis which is carried out according to ISO 14040-49.

[250] Ministry of Environment (2011): Technical Directive No. 08-2011 – laying down the requirements and environmental criteria for awarding the eco-label (Adhesives and sealants waster-soluble), accessed at http://translate.google.co.uk/translate?hl=en&sl=cs&u=http://www1.cenia.cz/www/ekoznaceni/seznam-esv&prev=/search%3Fq%3Dhttp://www1.cenia.cz/www/ekoznaceni/seznam-esv%26hl%3Den%26biw%3D946%26bih%3D893

[251] Cenia website: How eco-labelling works, accessed at http://translate.google.co.uk/translate?hl=en&sl=cs&u=http://www1.cenia.cz/www/ekoznaceni/jak-ekoznaceni-funguje&prev=/search%3Fq%3Dhttp://www1.cenia.cz/www/ekoznaceni/jak-ekoznaceni-funguje%2523narodniprogram%26biw%3D946%26bih%3D920

Extent of use of the scheme

There are several product groups which cover construction products, the certified products have been classified into the CEN mandates, see Table A2-72. However, of the 119 products, only 16% of products classified as a construction products.

Table A2-72: Products certified under Environmentally Friendly Product Label (Czech Republic)[252]

Mandate	Title	Number products	Products in scheme
M103	Thermal insulating products	2	Thermal insulation (2)
M119	Floorings	1	Hardwood flooring (1)
M125	Aggregates	1	Lightweight aggregate (1)
M127	Adhesives	2	Adhesives and sealants (water soluble) (2)
M129	Space heating appliances	1	Wood burning boiler (1)
M131	Pipes, tanks NOT in contact DW	10	Plastic pipes (10)
n/a	Other construction products	2	Adsorbants (2)
n/a	Non-construction products	100	Accommodation services for tourists (9), Cardboard and paperboard products (5), Cleaning and washing products (4), Detergents (5), Furniture (34), Gas boilers (1), Mulch made from recycled paper (1), Office and administrative services (2), Paper bags and shopping bags (1), Printed paper (5), Products from moulded paper pulp (2), Textile products (6), Water soluble paints (25)

[252] Cenia website: List of Environmentally friendly products, accessed at http://translate.google.co.uk/translate?hl=en&sl=cs&u=http://www1.cenia.cz/www/ekoznaceni/seznam-esv&prev=/search%3Fq%3Dhttp://www1.cenia.cz/www/ekoznaceni/seznam-esv%26hl%3Den%26biw%3D946%26bih%3D893

Ecolabel (Hungary[253])

Introduction

From May 2004, when Hungary joined the European Union, analogously with all the other legal measures, the European Ecolabel regulation came into force and the 'Flower label' was introduced. Adaptation of these measures has been asked for and the harmonisation of the national environmentally friendly system in order to ensure co-operation and co-ordination between the two systems.

The Hungarian 9/2004. (V. 25.) KvVM Government decree, amending the original 29/1997. (VIII. 29.) KTM, has modified the previous measure at several points. The new regulation applies to products and services produced or marketed in Hungary, thus it is not possible anymore to apply for the Hungarian environmentally friendly label for technologies.

Objectives of the scheme

The objective of the Hungarian Ecolabel is to promote production and distribution of environmentally friendly products by manufacturers and trade organisations, and to inform the consumers about the environmental characteristics of the products and services.

Geographical coverage

This is national scheme used in Hungary.

Focus of the scheme (content vs. emissions)

The Hungarian Ecolabel is awarded to products following an assessment of their environmental impact, taking into account the following aspects:

- environmental safety;
- energy conservation;
- emissions into the environment;
- the volume of waste and reduction of environmental hazards;
- ecosystems, air, water and soil protection; and
- protect the ozone layer.

Products covered

[253] Környezetbarát Termék Védjegy

Similarly to the other Ecolabel schemes, the Hungarian Ecolabel covers a mixture of consumer and construction products. Some of the product groups include:

- chemically stabilised rubber bitumen products;
- purpose and sanitary cleaners;
- bituminous binder covers;
- digital copiers;
- gas-fired condensing boilers and standing wall system;
- thermal insulation produced from mineral rock;
- aerated concrete technology building components;
- regular cleaning service using a micro-fibre fabrics;
- soaps, shampoos and conditioners;
- oil trap with selective filter;
- fire-fighting equipment and fire extinguishers;
- thermal solar systems; and
- ink Cartridges and toner Cartridges.

Substances covered (including award criteria)

Criteria are fully harmonised with the European Ecolabel requirements if the product group is also covered by this scheme. If the product group does not exist a document with the requirements is published in consultation with key stakeholders.

Testing/assessment

Documents and supporting test information on the content of the product is to be submitted to the Environmentally Friendly Products office. The certification lasts for a minimum of one year and up to five years.

Communicating conformity

Communication is performed by means of the logo. An important new element of the regulation is that the use of "environment friendly" denotation on the product or on its packaging is bound to an assessment procedure. Thereby the possibility to put discretionary information about the products or service's environmental characteristic on the product or on its packaging has been abated.

Objectivity/impartiality

Criteria and testing procedures comply with ISO 14024.

Extent of use of the scheme

At present there are 60 companies which hold a license under the Hungarian Ecolabel. Of the 63 certified products only 14% are classified as construction products, Table A2-73.

Table A2-73: Products certified under Hungarian Ecolabel[254]			
Mandate	**Type**	**Number of products**	**Products in scheme**
M100	Precast concrete products	2	Concrete Road (1), Polymer concrete drainage system (1)
M125	Aggregates	5	Crushed stone (1), Stone building materials (3), Gravel stone (1)
N/A	Other construction products	2	Solar thermal system (1), Oil interceptor (1)
N/A	Non-construction products	54	Biodegradable plastic packaging (35), Paper based packaging (2), Cleaning service fabrics (1), Hotel (1), Digital copiers (1), Purpose sanitary cleaners, detergents (5), Fire-fighting equipment and fire extinguishers (3), Televisions (2), Compost (1), Gas appliance (3)

Ecolabel (Slovakia)

Introduction

The Environmentally Friendly Product label is a voluntary scheme owned by the Ministry of Environment and the public service nature which promotes environmental protection.

Objectives of the scheme

The scheme aims to mitigate the negative environmental impacts of consumption and production through the promotion of environmentally friendly products.

Geographical coverage

National scheme developed in the Slovak Republic.

Focus of the scheme (content vs. emissions)

The Environmentally Friendly Product label is awarded on the basis of a range of criteria, including the content of heavy metals and harmful substances, origin of the raw materials and air and water pollution from production and use.[255]

[254] Kornyezetbarat-termek website: accessed at http://www.kornyezetbarat-termek.hu/

[255] Ekoporadna website: accessed at http://www.ekoporadna.sk/poradca-ekospotrebitela/environmentalne-nakupovani%20e/48-ekoznacky.html

Products covered

There is a small selection of product groups, those relating to construction products are:

- sanitary appliances;
- roofing tiles;
- cement;
- universal sorbent material; and
- wire stone constructions.

Substances covered (including award criteria)

Products containing chemical substances or mixtures meeting the criteria for classification as toxic, dangerous to the environment, carcinogenic or toxic to reproduction under Regulation EP and R (EC) no. 1272/2008 and products containing the substances referred to in Article 57 of Regulation EP and R (EC) no. 1907/2006 (REACH) will not be awarded the label[256].

Testing/assessment

The Ministry of Environment administers the scheme, whilst the Slovak Environmental Agency Centre for Waste Management and Environmental Management provide professional and technical support.

Communicating conformity

Products awarded the label are listed on the Slovak Environmental Agency website and can display the logo on certified products.

Objectivity/impartiality

The scheme follows the principles of the Type II eco-labelling which are standardised in the international standard ISO 14021.

Extent of use of the scheme

Although the majority of the product groups relate to construction products, the numbers of certified products are relatively low compared to the non-construction product groups. Consequently of the 118 certified products, only 26% are construction products, see Table A2-74.

[256] SAZP website: Environmental labelling of products, accessed at http://translate.google.co.uk/translate?hl=en&sl=sk&u=http://www.sazp.sk/public/index/go.php%3Fid%3D1669&prev=/search%3Fq%3Dhttp://www.sazp.sk/public/index/go.php%253Fid%253D1669%2526lang%253Dsk%26client%3Dfirefox-a%26hs%3DK9O%26rls%3Dorg.mozilla:en-US:official

Table A2-74: Products certified under Environmentally Friendly Product label (Slovak Republic)[257]			
Mandate	**Type**	**Number of products**	**Products in scheme**
M110	Sanitary appliances	10	Steel enamel bathtub (8), Shower enamelled steel bowl (2)
M114	Cement	2	Cement (2)
M116	Masonry	4	Wire stone constructions (4)
M122	Roof coverings	15	Roofing tiles (6), Roofing system (9)
N/A	Non-construction products	87	Universal sorbent material (87)

[257] SAZP website: Environmentally Friendly Product ("EVP"), accessed at http://translate.google.co.uk/translate?hl=en&sl=sk&u=http://www.sazp.sk/public/index/go.php%3Fid%3D1669&prev=/search%3Fq%3Dhttp://www.sazp.sk/public/index/go.php%253Fid%253D1669%2526lang%253Dsk%26client%3Dfirefox-a%26hs%3DK9O%26rls%3Dorg.mozilla:en-US:official

Annex 3 European Legislation and International Standards

Construction Products Regulation

The CPD was designed to ensure the free movement of all construction products by removing technical barriers to trade. Within this framework, it provided a system of harmonised technical specifications and rules that allowed a manufacturer to express the performance of construction products in relation to essential characteristics. It also introduced Notified Bodies to test and certify products and permitted, on a voluntarily basis, the CE marking of construction products.

Although the CPR is replacing the CPD, the philosophy and principal objectives of the CPD remain[258]. As is noted in recital 8 of the CPR, the CPR has been introduced to "simplify and clarify the existing framework, and improve the transparency and the effectiveness of the existing measures". In doing so, it seeks to reduce costs to manufacturers of construction products[259] and alleviate the financial burden of enterprises, particularly small and medium-sized enterprises (SMEs)[260].

With regard to the labelling of hazardous substances within construction products, the CPR may update the CPD. These are considered in more detail below.

Construction Products

The CPR is applicable to 'construction products', which are initially defined under Article 2:

> "*any product or kit which is produced and placed on the market for incorporation in a permanent manner in construction works or parts thereof and the performance of which has an effect on the performance of the construction works with respect to the basic requirements for construction works*".

Many of the terms contained within the definition above have been further clarified under Article 2. Thus 'kit' is a *"construction product placed on the market by a single manufacturer as a set of at least two separate components that need to be put together to be incorporated in the construction works".* Examples of construction kit include a fire alarm system, which comprises multiple sensors and an alarm that is operated by additional control equipment and a two part epoxy resin sold in two parts, with one tube containing adhesive and the second tube containing a hardener[261].

[258] See CPR Recital 58
[259] CPR Recital 19
[260] CPR Recital 27
[261] EC DG ENT (2002) Guidance Paper C (concerning the CPD) The Treatment of Kits and Systems Under the CPD accessed at http://eurocodes.jrc.ec.europa.eu/showpage.php?id=213

Under the CPR, 'construction works' are considered to be buildings and civil engineering works. Whilst the 'performance of a construction product' is the performance that is related to 'essential characteristics' which in turn, means those characteristics of the construction product which relate to the 'basic requirements' for the construction works. Finally, there are seven basic requirements listed under Annex I. A construction product must satisfy each of these basic requirements for an economically reasonable working life.

Dangerous and Hazardous Substances

Introduction

When the CPR fully enters into force, two new measures will address the protection of health and the environment. The first is Basic Requirement 3, hygiene health and the environment, which is in effect an extension of Essential Requirement 3 as contained under the CPD. Amongst other health effects, this provision is concerned with the release and emission of *dangerous substances.*

The second measure under Article 6 (5) of the CPR requires safety data sheets (as referred to under Article 31 of REACH, or where applicable information on substances in articles as stated under Article 33 of REACH) to accompany the Declaration of Performance. As is noted in Recital 25, this information concerns *hazardous substances* (no definition provided). Of course, the documentation will only need to be provided for those construction products that contain Substances of Very High Concern as depicted by REACH.

It should be noted that the terms 'hazardous substance' and 'dangerous substance' are not used interchangeably within the CPR. Whilst there is considerable overlap between the provisions associated with the terms, it must be acknowledged that the definitions and associated obligations are subtly different. These will now be considered separately below.

Basic Requirement 3, Hygiene, Health and the Environment

Annex I of the CPR sets out seven basic requirements for construction works, which serve as the basis for standardisation mandates and harmonised technical specifications[262]. Basic Requirement 3 seeks to protect hygiene, health and the environment:

> "*The construction works must be designed and built in such a way that they will, throughout their life cycle, not be a threat to the hygiene or health and safety of workers, occupants or neighbours, nor have an exceedingly high impact, over their entire life cycle, on the environmental quality or on the climate during their construction, use and demolition, in particular as a result of any of the following*:
>
> *(a) the giving-off of toxic gas;*
> *(b) the emissions of dangerous substances, volatile organic compounds (VOC), greenhouse gases or dangerous particles into indoor or outdoor air;*

[262] CPR Article 3

(c) the emission of dangerous radiation;
(d) the release of dangerous substances into ground water, marine waters, surface waters or soil;
(e) the release of dangerous substances into drinking water or substances which have an otherwise negative impact on drinking water;
(f) faulty discharge of waste water, emission of flue gases or faulty disposal of solid or liquid waste;
(g) dampness in parts of the construction works or on surfaces within the construction works."

It can be seen that Basic Requirement 3 is fulfilled, in part, by preventing the release, emission and radiation of dangerous substances.

Dangerous Substances

Dangerous substances are classified under the Dangerous Substances Directive 67/548/CEE[263] (DSD), although this and Directive 1999/45/EC on preparations is currently being replaced by Regulation 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures (CLP)[264] over a transitional period that will end 31 May 2015. The overarching aim of the CLP, as noted in the recital and Article 1, is to

> "*ensure a high level of protection of human health and the environment as well as the free movement of substances, mixtures and articles… "*

This objective is fulfilled by harmonising the criteria for the classification of substances and mixtures according to health, environmental and physical hazards. By definitively classifying substances in this way, regulatory legislation can objectively assess the inherent hazards and risks presented by a substance and take the appropriate measures. These measures can range from threshold concentration limits, exposure limits or the banning of a substance.

Under the framework of the CPR, a dangerous substance/preparation is something found within a construction product that is regulated at European or national level. Construction products (whether substance, article or mixture) will need to conform to all relevant threshold values contained within such legislation. The European Commission has established an informative database which provides manufacturers with information on the relevant legislation for different Member States[265]. Examples of regulations and directives that have direct interfaces with construction products in the fields of chemical and environmental policy and identify dangerous substances that will need to be taken into

[263] Council Directive 67/548/EEC on the Approximation Of Laws, Regulations and Administrative Provisions Relating to the Classification, Packaging And Labelling of Dangerous Substances
[264] Regulation (EC) No 1272/2008 of the European Parliament and of the Council on Classification, Labelling and Packaging of Substances and Mixtures
[265] This can be accessed here: http://ec.europa.eu/enterprise/construction/cpd-ds/

account when drafting testing and conformity procedures for Basic Requirement 3, include[266]:

- Regulation concerning the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) 1907/2006[267] (see below REACH classification summary)
- Regulation (EC) No 850/2004 on Persistent Organic Pollutants[268]
- Water Framework Directive 2008/105/EC[269]
- Groundwater Directive 2006/118/EC[270]

Whether substances identified as dangerous under legislation will be considered as dangerous when drafting test standards and conformity procedures in the context of the CPR, will depend on the particular construction product and its intended use. For example, test standards for a construction product such as an outside water pipe may, for the purposes of Basic Requirement 3 (d) of the CPR, take into account priority substances listed under legislation such as the Water Framework Directive. Conversely, these priority substances are likely to be of less importance for an indoor heating pipe, contained within a building, for which there is no risk of release into groundwater, marine water, surface waters or soil.

Declaration of Performance

Under the CPD, a manufacturer was required to draw up a declaration of conformity to indicate that the construction product placed on the market was covered by a harmonised product standard or conforms to an appropriate European Technical Assessment. Under the CPR, the declaration of conformity is replaced by the declaration of performance (DoP).

A DoP must provide the information listed under Article 6, thereby delivering information about the essential characteristics of the construction product to the market. By drawing up the DoP, the manufacturer assumes responsibility for the conformity of the construction product with the declared performance.

On the basis of the information contained in the DoP, the user will decide to buy, amongst all the products available on the market, the one which is fit for the use he intends to employ the product. On the basis of this information, the buyer will assume full

[266] EC DG ENT (2012) Indicative List of Regulated Substances Possibly Associated with Construction Products Under the CPD

[267] Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

[268] Regulation (EC) No 850/2004 of the European Parliament and of the Council on Persistent Organic Pollutants and amending Directive 79/117/EEC

[269] Directive 2008/105/EC of the European Parliament and of the Council on Environmental Quality Standards in the Field of Water Policy, amending and subsequently

[270] Council Directive 2006/68/EEC on the protection of groundwater against pollution and deterioration

responsibility for product used. The DoP thus constitutes a key element in the functioning of the Internal Market for construction products, establishing transparency and a clear system of allocation of responsibilities between actors.

Recital 25 and Article 6 (5) – Hazardous substance

The second relevant new provision is Article 6 (5). Introduced to try and improve the possibilities of sustainable construction and facilitate the development of environmentally-friendly products, it requires the DoP to be accompanied by information on the content of hazardous substances[271]. Thus Article 6(5) requires

> '*the information referred to in Article 31 or, as the case may be, in Article 33 of Regulation (EC) No 1907/2006'*.

Article 33 of REACH imposes a duty to communicate information on substances in articles. As noted under Article 3 of REACH, these are objects which are given a special shape, surface or design during production which determine its function to a greater degree than its chemical composition. The vast majority of construction products are therefore likely to be classified as an article.

Under Article 33 of REACH every supplier of products (which would include construction products) must provide certain information about the product, provided the product has a concentration above 0.1% weight by weight of a Substance of Very High Concern (SVHC). Article 57 lists the criteria for which a substance can be considered a SVHC:

- carcinogenic;
- mutagenic;
- toxic for reproduction;
- persistent, bio-accumulative and toxic;
- very persistent and very bio-accumulative; or
- there is scientific evidence of probable serious effects to human health or the environment which give rise to an equivalent level of concern to those of other substances listed above.

A supplier of a product with a concentration above 0.1% weight by weight of a SVHC must provide the recipient of the article with sufficient information, which as minimum will include the name of the substance. Unlike with a dangerous substance, this does not take into account the intended purpose of the construction product or the hazard that it poses. The information must always be provided which interestingly, is not the case for consumers under REACH, who must request such information. .

Although most construction products will be articles, construction products such as cement (which comprise a mixture of two or more substances) are considered to be preparations. If appropriate, these products must be accompanied by information listed under Article 31 of REACH.

[271] Recital 25

Article 31 requires a supplier of a preparation to provide the recipient with a safety data sheet if the preparation is:

- classified as dangerous according to Directives 67/548/EEC or 1999/45/EC;
- persistent, bio-accumulative and toxic or very persistent and very bio-accumulative; or
- it is a SVHC for other reasons.

Drinking Water Directive

The Drinking Water Directive (DWD) seeks to protect the health of consumers in the European Union from the adverse effects of contamination of water intended for human consumption by ensuring that it is wholesome and clean. It applies to all water intended for human consumption, with the exception of natural mineral waters and waters which are medicinal products.

Article 10 obliges Member States to take all necessary measures to ensure that substances and materials for new installations, that come into contact with water intended for human consumption during its preparation or distribution, are not present in the water in higher concentrations than is necessary for the purpose of their use and do not undermine the DWD objective of protecting human health.

The DWD references the CPD, so as to ensure the requirements of the DWD are respected. The CPD/CPR covers those products that come into contact with fully treated water, this being the last point of treatment up to and including the consumers drinking tap. Whereas all products that come into contact with water that may be subsequently drunk fall within the scope of the DWD. This would include all products from collection to the consumers tap.

Groundwater Directive 2006/118/EC

The Groundwater Directive is one of two Daughter directives under the Waste Framework Directive (WFD) and seeks to clarify objectives which are concerned with the quality of groundwater. In 2006 the Directive on the protection of groundwater against pollution and deterioration was adopted, with an implementation deadline of January 2009 for Member States[272]. Until December 2013 the 1980 Groundwater Directive operated in tandem with the new directive.

[272] Defra website: Archive: Water Framework Directive – Daughter Directives, accessed at http://archive.defra.gov.uk/environment/quality/water/wfd/daughter-dirs.htm

The Directive requires that inputs or discharge of pollutants to groundwater are either prevented or limited, with the aim of achieving a good chemical status[273]. In order to meet this objective the directives sets out specific measures:

- criteria and procedures to assess the chemical status of groundwater;
- criteria for the identification of significant and sustained upward trends in concentrations of pollutants in groundwater and reversing this trend; and
- measures to prevent or limit inputs of specific substances into groundwater[274].

Member States are responsible for determining whether a substance is hazardous or non-hazardous, the former must be prevented from entering groundwater and the latter limited where possible[275].

Registration, Evaluation, Authorisation and Restriction of Chemicals

The REACH Regulation entered into force in 2007 with the aim to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemicals industry. REACH also aims to promote the use of alternative methods for the assessment of the hazardous properties of substances e.g. quantitative structure-activity relationships (QSAR).

REACH applies to substances manufactured or imported into the EU in quantities of one tonne or more per year. Some substances are specifically excluded:

- radioactive substances;
- substances under customs supervision;
- the transport of substances;
- non-isolated intermediates
- waste; and
- some naturally occurring low-hazard substances.

Some substances, covered by more specific legislation, have tailored provisions, including:

- human and veterinary medicines;
- food and foodstuff additives; and
- plant protection products and biocides[276].

[273] Environment Agency (2010): Environmental Permitting – Environmental Permitting Guidance Groundwater Activities, accessed at http://www.environment-agency.gov.uk/static/documents/Business/ep-groundwater-activities.pdf

[274] The Scottish Government website: Part 2 Groundwater Directive 2006/118/EC, accessed at http://www.scotland.gov.uk/Publications/2009/03/19110510/5

[275] WFDUK website: JAGDAG work area, accessed at http://www.wfduk.org/stakeholders/jagdag-work-area-0

[276] HSE (nd): What is REACH? Downloaded from http://www.hse.gov.uk/reach/whatisreach.htm

The regulation places the burden of proof on companies. To comply with the regulation, companies must identify and manage the risks linked to the substances they manufacture and market in the EU. They have to demonstrate how the substance can be safely used, and they must communicate the risk management measures to the users.

Information requirements relevant to construction sector are contained in Articles 31 and 32 of REACH, which refer to the responsibility of the supplier to provide information to downstream users. Article 31 describes conditions for preparing a datasheet on dangerous substances, while Article 32 refers to the information requirements of suppliers of other non-toxic substances, who do not have to present a safety data sheet. Furthermore restrictions on certain substances are valid for all construction products such as the use of cadmium in plastic floor and wall coverings[277].

Green Public Procurement

Green Public Procurement (GPP) is defined in the Public Procurement for a Better Environment Communication (EC, 2008c:4) as:

> *"a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured."*
>
> *This Communication also describes the general GPP criteria elaboration process, which is explicitly described as being "based on a life cycle approach", and using "existing European and national ecolabel criteria where appropriate".*

Some of the specific criteria for GPP explicitly rely on the EU Ecolabel, although without stipulating particular products that carry the EU Ecolabel. Instead, the GPP criteria may, for instance, require products to "meet the ecological criteria of the European Ecolabel".

The Commission is committed to GPP as it is considered to be an effective way to stimulate innovation in environmental technologies, products and services. This Communication provides guidance on how to reduce the environmental impact caused by public sector consumption by promoting and using GPP. More specifically, it addresses four obstacles that have been identified as preventing the uptake of GPP. Those obstacles being:

- the absence of an established process for setting common GPP criteria;
- insufficient information on the life cycle costing of products and relative costs of environmentally friendly products/services;
- legal uncertainty and operational guidance as to how to include environmental criteria in tender documents; and
- the lack of political support, resources for implementing and promoting GPP and indicators for monitoring.

[277] European Chemicals Agency (nd): Understanding REACH, downloaded from http://echa.europa.eu/web/guest/regulations/reach/understanding-reach

The remit of the Communication extends to all public procurement procedures, above and below the threshold defined by the European public procurement. Ten sectors[278] have been identified as the most suitable for implementing GPP, with criteria (based on existing European/national eco-label criteria and stakeholder inputs) and product services developed.

There are two forms of GPP criteria, "core" and "comprehensive" criteria. As its name suggests, the core criteria consists of the fundamental elements of GPP, including only the key areas of environmental performance. This basic format ensures that administrative costs are kept to a minimum for those companies that must comply with these criteria. The Commission has proposed that by the year 2010, 50% of all tendering procedures should comply with the endorsed common "core" criteria.

The comprehensive GPP encompasses higher levels of environmental performance for those authorities that have ambitious or innovative environmental goals. The two criteria allow Member States and contracting authorities to gradually improve levels of GPP, whilst also encouraging and fostering a market for products and services that have improved environmental service.

There are two types of indicators that can be used to assess GPP performance, quantitative indicators and impact orientated indicators. The former used to assess the uptake and progress of the policy by calculating the value of green contracts as compared to the overall value of public procurement contracts, whilst the latter is used to assess the environmental and financial gains delivered by GPP.

The GPP seeks to encourage public authorities to procure goods, services and works that have a reduced environmental impact throughout their life-cycle compared to goods services and works with the same primary function, which would otherwise be procured.

Details of the two forms of GPP criteria, "core" and "comprehensive" are:

1) Core criteria can be used by any contracting authority across the Member States. These address the key environmental criteria for the product in question and require little effort in terms of verification or additional costs.
2) Comprehensive criteria allow procurers to purchase the most environmentally friendly products on the market. Consequently, they may require additional verification effort and additional costs when compared to other products.

[278] Construction, Food and catering services, Transport and transport services, Energy, Office machinery and computers, Clothing, Uniforms and other textiles, Paper and printing services, Furniture, Cleaning products and services and Equipment used in the health sector.

A study on the uptake of the 10 products[279] and service groups found that construction lagged behind, with an uptake level below 20%[280].

Table A2.1: Green public procurement, construction	
Name of scheme	Green Public Procurement (GPP), Construction.
What is the primary objective of the scheme	There are recommendations for the procurement of construction works. This also encompasses the supply of services related to construction such as cooling, heating and ventilation services and the provision of electricity. These criteria can be used for the tender procedures of new buildings and the renovation or maintenance of existing buildings. One of the goals of the GPP for construction works is encouraging the use of non-toxic building materials and where possible, substituting dangerous building materials for safer products.
Is the scheme, regional, national, international? If international, what other countries does the scheme operate?	International (European).
In what form does communication of conformity to the scheme take (e.g. is a label affixed to the product, certification accompanies product)?	
Is the scheme focused only on construction products? Group of Construction Products to which the scheme applies (e.g. Wood, PVC, Concrete)?	It looks at the building as a system, rather than an accumulation of components. It therefore focused on construction works.
How does the scheme define those chemicals/substances that are regulated (e.g. refers to legislation, lists specific substances)?	Core/comprehensive criteria Lists sulphurhexafluoride (often used as an inert filling for insulated glazing windows) and VOCs
What performance requirements must be fulfilled to ensure conformity to the scheme (e.g. emissions below specified level, content below specified concentration, certain substances excluded)?	Core/comprehensive criteria Sulphurhexafluoride must not be used. VOC emissions must not exceed the values outlined under EN ISO 160000 – 9 to -11 or equivalent Additional points can be awarded depending on the percentage of construction materials and construction products that comply with a Type I ecolabel or provide clear and transparent information on product performance based on type III product declarations.
How is conformity with the scheme ascertained? Third party assessment based on information received from suppliers or do suppliers attest that their products conform to pre-defined qualifying criteria?	Core/comprehensive criteria Bidders must declare Sulphurhexafluoride will not be used. VOC test reports in accordance with N ISO 160000 – 9 to -11 or

[279] Cleaning products and services, construction, electricity, catering and food, gardening, office IT equipment, copying and graphic paper, textiles, transport and furniture

[280] The uptake of Green public procurement in the EU 27. http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&ved=0CD0QFjAC&url=http%3A%2F%2Fec.europa.eu%2Fenvironment%2Fgpp%2Fpdf%2FCEPS-CoE-GPP%2520MAIN%2520REPORT.pdf&ei=cJhuUY-_OMev7Abck4FQ&usg=AFQjCNE5X9jLFTw_Xk9Aa1UCRYCBClMEpg&bvm=bv.45368065,d.ZGU

Table A2.1: Green public procurement, construction	
	equivalent must be provided. N.B. – under the comprehensive criteria, bidders can also present a life cycle assessment of building assessment if this exists.

Table A2.2: Green public procurement, windows, glazed doors and skylights	
Name of scheme	Green Public Procurement (GPP), Windows, Glazed Doors and Skylights
What is the primary objective of the scheme	The core criteria seek to improve thermal efficiency beyond that required by national regulations, alongside some basic material impact requirements. The comprehensive criteria demand further energy efficiency and include a greater range of material impacts associated with the production, installation and disposal of the windows.
Is the scheme, regional, national, international? If international, what other countries does the scheme operate?	International (European).
In what form does communication of conformity to the scheme take (e.g. is a label affixed to the product, certification accompanies product)?	There are no ecolabels that cover all climatic regions of Europe that can be used as a basis to identify GPP criteria across the EU.
Is the scheme focused only on construction products? Group of Construction Products to which the scheme applies (e.g. Wood, PVC, Concrete)?	This part of the GPP is concerns windows, glazed doors and skylights.
How does the scheme define those chemicals/substances that are regulated (e.g. refers to legislation, lists specific substances)?	Under the technical specifications to which all bids must comply with, it is noted that PVC must be complaint with Vinyl Plus or equivalent. Under the Award Criteria, procurers can gain additional points by addressing specifications relating to lead, its compounds and substances with the listed R-phrases under Directive 1999/45/EC, 67/548/CEE: Carcinogenic (R40, R45, R49); Harmful to reproductive system (R60, R61, R62, R63); Mutagenic, cause heritable genetic damage and possible risks of irreversible effects (R46, R68); Toxic (R23, R24, R25, R26, R27, R28, R51); Allergic when inhaled (R42); Harmful to the environment (R50, R50/53, R51/53, R52, R52/53, R53); Danger of serious damage to health by prolonged exposure (R48). Regulation (EC) No 1272/2008 will replace Directive 1999/45/EC, 67/548/CEE. Additional points can also be awarded to procurers who meet specifications related to substances with the following hazard statements: Carcinogenic (Carcinogenic 1A, 1B and 2: H350, H350i, H351);

Table A2.2: Green public procurement, windows, glazed doors and skylights	
	Harmful to the reproductive system (Reproductive 1A, 1B and 2: H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, and H360Df); Mutagenic and cause heritable genetic damage (Mutagenic 1B and 2: H340 and H341); Toxic (Acute Toxicity 1, 2 and 3: H330, H331, H311, H301, H310, H300, Aquatic Chronic 2: H412); Allergenic when inhaled (Repertory Sensitivity 1: H334); Harmful to the environment (Aquatic Acute 1 and Aquatic Chronic 1, 2, 3 and 4: H400, H410, H411, H412, H413); Danger of serious damage to health by prolonged exposure (Health Hazard: H372 and H373)
What performance requirements must be fulfilled to ensure conformity to the scheme (e.g. emissions below specified level, content below specified concentration, certain substances excluded)?	Participation with Vinyl Plus suffices, or written evidence that equivalent standards have been met. To gain additional points, lead and its compounds must not be intentionally added to plastics and coatings used in windows. Other named substances must not be released or leach out of these products, under normal usage conditions. Chemical products contained within the finished window (sealant, adhesive, putty etc.) must satisfy one of two requirements: Product must not be classified as environmentally hazardous according to EU Directive 1999/45/EC; or Product may contain a maximum 2% by weight of substances classified as environmentally hazardous according to EC Directive 67/548/EC. Although for wood preservatives this figure rises to 3%.
How is conformity with the scheme ascertained? Third party assessment based on information received from suppliers or do suppliers attest that their products conform to pre-defined qualifying criteria?	Products with an applicable Type I ecolabel that fulfils the relevant criteria will comply with the GPP. Other proof will also be accepted. Where there are thresholds, such as for chemical products in windows, material data sheets that are not more than three years old must be supplied. Furthermore, there must also be written confirmation that the chemical products are approved for their intended purpose by an appropriate authority in the products country of manufacture, and conformation that chromate copper arsenate, copper citrate, organic tin compounds or creosote oil are not present.

Table A2.3: Green public procurement, thermal insulation products	
Name of scheme	Green Public Procurement (GPP), Thermal Insulation Products
What is the primary objective of the scheme	To redress two key environmental impacts: Hazardous materials which can impact on air and water quality as well as human health. Such materials are also unsuitable for landfill in non-hazardous sites; The energy efficiency of the thermal products.
Is the scheme, regional, national, international? If international, what other countries does the scheme operate?	International (European).
In what form does communication of conformity to the scheme take (e.g. is a label affixed to the	

Table A2.3: Green public procurement, thermal insulation products	
product, certification accompanies product)?	
Is the scheme focused only on construction products? Group of Construction Products to which the scheme applies (e.g. Wood, PVC, Concrete)?	Such products are used to keep buildings cooler in summer and warmer in winter. The six main applications for thermal insulation products are: Cavity wall insulation; Solid wall insulation Loft insulation; Floor insulation; Roof insulation; Insulation for pipe work and ducts. Ecolabels currently define insulation products by the material they are made from, these being: Inorganic mineral fibre; Organic fuel derived; Organic plant/animal derived; Other. There is currently no ecolabel that suitably addresses insulation for pipework and ducts or foil type products. Consequently, the GPP criteria apply only to thermal insulation products that fall into categories 1-5 above.
How does the scheme define those chemicals/substances that are regulated (e.g. refers to legislation, lists specific substances)?	<u>Core criteria:</u> A product must not release or leach out any substance above existing limit values set in the following regulations: Those substances regulated under Regulation 842/2006/EC on Fluorinated Gases; Substances or preparations classified under Directive 1999/45/EC and 67/548/CEE with one of the classifications below, shall not be released: Carcinogenic (R40, R45, R49); Harmful to the reproductive system (R60, R61, R62, R63); Mutagenic (R46, R68); Toxic (R23, R24, R25, R26, R27, R28, R51); Allergenic when inhaled (R42); Cause heritable genetic damage (R46); Danger of serious damage to health by prolonged exposure (R48); Possible risks of irreversible effects (R68); Harmful by inhalation (R20); and Harmful in contact with skin (R21) Substances or preparations classified according to the CLP Regulation EC 1272/2008 with one of the hazard statements below, shall not be released: Carcinogenic (H350-351); Harmful to the reproductive system (H360-361); Mutagenic (H340-341); Toxic (H300- H301, H310-H311, H330-H331, H411); Allergenic when inhaled (H334);

Table A2.3: Green public procurement, thermal insulation products	
	Cause heritable genetic damage (H340); Danger of serious damage to health by prolonged exposure (H372-373); and Possible risks of irreversible effects (H371).
What performance requirements must be fulfilled to ensure conformity to the scheme (e.g. emissions below specified level, content below specified concentration, certain substances excluded)?	Core criteria A product must not release or leach out any substance above existing limit values in the aforementioned regulations
How is conformity with the scheme ascertained? Third party assessment based on information received from suppliers or do suppliers attest that their products conform to pre-defined qualifying criteria?	Core criteria The bidder must prove that the product conforms to the GPP criteria. If there is a relevant harmonised standard under the CPD for CE marking, the information accompanying the CE marking must be provided by the supplier to demonstrate compliance with the criteria under the GPP. If criteria under the GPP are not contained in the accompanying information to CE marking under the CPD, a product that has been awarded a relevant Type I ecolabel will suffice as verification that the product conforms to the criteria.

Table A2.4: Green public procurement, hard floor coverings	
Name of Scheme	Green Public Procurement (GPP), Hard floor coverings
What is the primary objective of the scheme	The core criteria are concerned with energy consumption, the use of hazardous substances, water use and management. The comprehensive criteria have requirements related to raw material extraction, emissions to air and water and potential release of dangerous substances in the use phase.
Is the scheme, regional, national, international? If international, what other countries does the scheme operate?	International (European).
In what form does communication of conformity to the scheme take (e.g. is a label affixed to the product, certification accompanies product)?	
Is the scheme focused only on construction products? Group of Construction Products to which the scheme applies (e.g. Wood, PVC, Concrete)?	Hard floor coverings are defined as Natural products (natural stones CEN TC 246); Processed hardened products (Agglomerated stones JWG 229/34 EN 14618, concrete paving CEN/TC 178 and Terrazzo tiles CEN/TC 229; and Processed fired products (ceramic tiles CEN/TC67 and clay tiles CEN 178).
How does the scheme define those chemicals/substances that are regulated (e.g. refers to legislation, lists specific substances)?	Core/comprehensive criteria: Relevant substances are those with the following R-phrases under Council Directive 67/548/EEC:

<table>
<tr><th colspan="3">Table A2.4: Green public procurement, hard floor coverings</th></tr>
<tr><td></td><td colspan="2">R45 may cause cancer;
R46 may cause heritable genetic damage;
R49 may cause cancer by inhalation;
R50 very toxic to aquatic organisms;
R51 toxic to aquatic organisms;
R52 harmful to aquatic organisms;
R53 may cause long term adverse effects in the aquatic environment;
R54 toxic to flora;
R55 toxic to fauna;
R56 toxic to soil organisms;
R57 toxic to bees;
R58 may cause long-term adverse effects in the environment;
R59 dangerous for the ozone layer;
R60 may impair fertility;
R61 may cause harm to unborn child;
R62 possible risk of impaired fertility;
R63 possible risk of harm to the unborn child; and
R68 possible risk of irreversible effects.

Council Directive 67/548/EEC will be replaced by Regulation (EC) No 1272/2008. Under the new Regulation, the following substances are considered relevant for hard floor coverings:

H350, H340, H350i, H400, H410, H411, H412, H413, EUH059, H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df, H341.

It should be noted that this criteria is not applicable to the quota of closed-loop recycled materials whereby materials are used, extracted and returned to the same production system after recycling treatment.

Lead, cadmium and antimony (or any of their compounds).</td></tr>
<tr><td rowspan="5">What performance requirements must be fulfilled to ensure conformity to the scheme (e.g. emissions below specified level, content below specified concentration, certain substances excluded)?</td><td colspan="2">The substances and preparations listed under Directive 67/548/EEC or Regulation (EC) No 1272/2008 must not be added to raw materials.
The content of Lead, Cadmium and antimony (or any of their compounds) in hard floor products must not exceed the following limits.</td></tr>
<tr><td>Parameter</td><td>Limit (% in weight of the glazes)</td></tr>
<tr><td>Lead</td><td>0.5</td></tr>
<tr><td>Cadmium</td><td>0.1</td></tr>
<tr><td>Antimony</td><td>0.25</td></tr>
<tr><td>How is conformity with the scheme ascertained? Third party assessment based on information received from suppliers or do suppliers attest that their products conform to pre-defined qualifying criteria?</td><td colspan="2">A relevant Type I ecolabel fulfilling the listed criteria can be used to verify the products compliance with GPP criteria.</td></tr>
</table>

Table A2.5: Green public procurement, wall panels	
Name of scheme	Green Public Procurement, Wall Panels
What is the primary objective of the scheme	This part of the GPP addresses energy consumed during manufacture, natural resource consumption that arise during manufacture od product, waste that occurs during installation and the disposal of products when they reach the end of their useful life. It also seeks to reduce off-gassing i.e. the release of binding agents from wood panels when they are installed.
Is the scheme, regional, national, international? If international, what other countries does the scheme operate?	International (European)
In what form does communication of conformity to the scheme take (e.g. is a label affixed to the product, certification accompanies product)?	
Is the scheme focused only on construction products? Group of Construction Products to which the scheme applies (e.g. Wood, PVC, Concrete)?	Two types of wall panels that comprise almost all of the wall market form the focus of the GPP criteria. These are gypsum plasterboard and wood based boards.
How does the scheme define those chemicals/substances that are regulated (e.g. refers to legislation, lists specific substances)?	<u>Comprehensive criteria</u> <u>Gypsum plasterboard</u> Products must contain radioactive substances (e.g. from slag products, ash from coal fires, phosphogypsum) below specified levels. Refers to substances with R-phrases under Directive 67/548/EEC and Directive 1999/45/EC: Carcinogenic (R40, R45, R49); Mutagenic (R46, R68); Harmful or toxic to the reproductive system (R60, R61, R62, R63); and Toxic (R23, R24, R25, R26, R27, R28). Regulation (EC) No 1272/2008 will replace the aforementioned Directives. Substances with the hazard statements under Regulation (EC) No 1272/2008 listed below are also of interest for wall panels: Carcinogenic (Carcinogenic 1A, 1B and 2: H350, H350i, H351); Mutagenic and cause heritable genetic damage (Mutagenic 1B and 2: H340 and H341); Harmful to the reproductive system (Reproductive 1A, 1B and 2: H360F H360D, H361f, H361d, H360FD, H361fd, H360Fd, and H360Df); and Toxic (Acute Toxicity 1, 2 and 3: H330, H331, H311, H301, H310, H300, Aquatic Chronic 2: H412) <u>Wood wall panels</u>

Table A2.5: Green public procurement, wall panels	
	Core criteria Formaldehyde-containing binding agents are regulated. Comprehensive criteria Formaldehyde containing binding agents, free formaldehyde in glues, phenol-containing binding agents and Polymeric Methylene Diphenyl Diisocyanate (PMDI) – based binding agents is subject to criteria. In addition, products with the R-phrases under Directive 67/548/EEC and Directive 1999/45/EC below are also subject to regulation: Carcinogenic (R40, R45, R49); Mutagenic (R46, R68); Harmful or toxic to the reproductive system (R60, R61, R62, R63); and Toxic (R23, R24, R25, R26, R27, R28). Regulation (EC) No 1272/2008 will repeal the aforementioned Directives, with R-phrases being replaced by hazard statements. Consequently, there are criteria for substances with the hazard statement Carcinogenic (Carcinogenic 1A, 1B and 2: H350, H350i, H351); Mutagenic and cause heritable genetic damage (Mutagenic 1B and 2: H340 and H341); Harmful to the reproductive system (Reproductive 1A, 1B and 2: H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, and H360Df); and Toxic (Acute Toxicity 1, 2 and 3: H330, H331, H311, H301, H310, H300, Aquatic Chronic 2: H412).
What performance requirements must be fulfilled to ensure conformity to the scheme (e.g. emissions below specified level, content below specified concentration, certain substances excluded)?	Gypsum plasterboard In terms of radioactive material, gypsum plasterboard must demonstrate that the gamma index (m y) or the activity index (l 1) is below 1. The final wall panel product should not contain any of the chemical substances listed above. Wood wall panels Core criteria Formaldehyde containing binding agents must be below the emission limit of the E1 standard for formaldehyde, in accordance with EN13986. This is also applicable to coated boards and pre-coating. Comprehensive criteria

Table A2.5: Green public procurement, wall panels	
	The following specifications apply to wood based wall panels: Formaldehyde binding in wood products should surpass the E1 standard for formaldehyde following EN13986 Free formaldehyde in glues for plywood panels or laminated wood panels must not exceed 0.5% w/w Composite wood panels with phenol-containing binding agents must not possess a phenol concentration of 14µg/m³ in the test room Wood panels with PMDI-based binding agents must not emit more than 1µg/m³ (detectable) of the monomer MDI. The final product should not contain any substance with any of the R-phrases or hazard statements noted above.
How is conformity with the scheme ascertained? Third party assessment based on information received from suppliers or do suppliers attest that their products conform to pre-defined qualifying criteria?	Gypsum plasterboard For the radiation requirements, the bidder must prove that this criterion has been met. This may take the form of independent laboratory testing or its equivalent. A supplier can declare conformity with GPP criteria for substances contained within Gypsum plasterboard through a relevant Type I ecolabel or other appropriate form of proof. This could be an independent laboratory test report or material safety data sheet. Wood wall panel Core criteria Appropriate proof, such as an independent laboratory test report or an equivalent must be provided by the bidder. Comprehensive criteria Conformity to the formaldehyde-containing binding agents must be verified with appropriate proof such as an independent test report. For the remaining criteria, a relevant Type I Ecolabel that fulfils the listed criteria can be used to verify compliance with the requirements. Other appropriate proof will also be accepted.
Any other information contained within studies related to the scheme that may be useful (e.g. number of applications, effectiveness of the scheme)?	Several Ecolabels currently exist for wall panels. The Nordic Swan covers both types of wall panels whilst the Blue Angel covers only composite wood panels.

Waste Framework Directive

Table A2.6: Waste Framework Directive	
Name	Waste Framework Directive
What is the primary objective of the legislation?	As noted in Article 1, "to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such

Table A2.6: Waste Framework Directive	
	use". There is a waste hierarchy which indicates the order in which waste legislation should be applied, with preventative measures applied first.
Is the legislation, regional, national, international?	International (European)
In what form does communication of conformity to the legislation take place?	
Is the legislation focused only on construction products?	No. Concerned with waste which is an object which the holder discards or intends to discard. A construction product may fall within the definition of waste.
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Annex III lists properties that render waste hazardous. Harmful substances are typically carcinogenic and toxic substances that may negatively influence human health or the environment. These include: Heavy metals; PCB; Asbestos; Polycyclic aromatic hydrocarbons (PAH's); Carcinogenic substances; Persistent organic compounds; and Insulation materials containing ozone depleting substances. There is also a European Waste Catalogue which seeks to encourage the harmonized classification of waste and ensure the harmonised determination of hazardous waste within the community.
What performance requirements must be fulfilled to ensure conformity to the legislation?	Waste prevention entails measures to be taken before a product has become waste, which reduce the content of harmful substances in materials and products. Hazardous waste is to be collected, transported, stored and treated in conditions that protect human health and the environment. Hazardous waste must not be mixed, either with other categories of hazardous waste or with other waste, substances or materials.
How is conformity with the legislation ascertained?	Member States are required to take the necessary action to fulfil the measures of the Directive, which includes record keeping and penalties for those that infringe the provisions of the Directive.
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	National waste prevention plans for construction waste must be in place by December 2013. Several countries already have prevention plans (Austria, Finland).

Directive 2010/31/EU on the energy performance of buildings

The objective of the recast of EPBD 2002 on the energy performance of buildings, EPBD recast 2010, is to clarify and simplify certain provisions, extend the scope of the Directive, strengthen some of its provisions so that their impact is more effective, and to provide for the leading role of the public sector. In doing so, the transposition and implementation of the EPBD recast 2010 is to be facilitated and a significant portion of the remaining cost-efficient potential in the buildings sector will be available. At the same time, the objectives and principles of the current Directive are retained and it is again left to Member States to determine the concrete requirements and ways to implement it as before. The EPBD recast 2010 was motivated by the EU expectation to lower the energy consumption by 5-6% across EU member states, slashing CO2 emissions by 5% by 2020 and to harmonize and strengthen EU legislation and methodologies across all member states.

Directive 2006/32/EC on energy end-use efficiency

The purpose of this Directive is to increase the energy end-use efficiency products and services. The goal is to achieve a minimum annual volume of 1% in energy savings, and an 9% overall in the period from 2008 to 2016. The energy saving measures for end users include guidelines about the insulation of buildings, the addition of passive solar elements to the outside buildings constructions, the installation of solar thermal systems, etc.

Directive 2005/32/EC for the setting of eco-design requirements

This Directive establishes a framework for setting eco-design requirements (such as energy efficiency) for all energy using products in the residential, tertiary and industrial sectors. The Directive does not introduce directly binding requirements for specific products, but does define conditions and criteria for setting requirements regarding environmentally relevant product characteristics (such as energy consumption).

Towards a thematic strategy on the urban environment

The main objectives covered by this Communication are to revitalize and mainstream the environmental management of Europe's largest towns and cities and to overcome isolated policies (buildings, infrastructure, transport, energy, waste, etc.) with a general focus on sustainable urban management, sustainable urban transport, sustainable construction and sustainable urban design. Within these main objectives the development of a common methodology for evaluating the overall sustainability of buildings and the built environment is the main target of this thematic strategy. Aspects such as the life cycle assessment of buildings and the development of indicators for life-cycle costs are part of this strategy. The Thematic Strategy on the Urban Environment was adopted on 11 January 2006. It strongly encourages Member States, regional and local authorities to develop programmes to promote sustainable construction. The document focuses not only on energy related aspects, such as increasing the renovation rate, but also on the labelling of building products and strategies for the prevention and recycling of waste.

International Standards

Introduction

There are two international organisations which are of general relevance for this report. These standards organizations sustain themselves financially through the sale of standards. Although there is a degree of overlap between organizations, it must be stressed that European Standards and ISO are different.

International Organization for Standardization (ISO)

ISO is the world's largest developer and publisher of International Standards[281]. Prices for individual published standards (in English or French) are typically in the range of €40 to €80.

ISO began operations in 1947 from its base in Geneva with the intention *to facilitate the international coordination and unification of industrial standards.*

Since then, ISO has developed over 18,000 International Standards on a variety of subjects and 1,100 new ISO standards are published every year. The organization now comprises a network of the national standards institutes of 159 countries, one member per country, with a Central Secretariat (still based in Geneva).

All EU-27 Member States are Members of ISO apart from Estonia and Latvia which are Correspondent Members.

European Committee for Standardization (CEN)

CEN, the European Committee for Standardization, was founded in 1961 by the national standards bodies in the European Economic Community and EFTA countries. CEN is a non-profit making technical organization set up under Belgian law[282] and has published over 13,829 documents (ranging from standards to technical specifications and technical reports), and in 2009, CEN produced 1454 documents.

CEN's National Members now comprise national standards organizations of 31 European countries including all EU-27 Member States, three EFTA Member States (Iceland, Norway, and Switzerland), and Croatia. It is worth noting that these organizations are the same organizations represented in ISO. There are also seven Associate Members (European organisations), Affiliates (National Standards Bodies who are members or corresponding members of ISO), two Counsellors (representatives from the European Commission and EFTA), and the CEN Management Centre is in Brussels.

These National Members vote for European Standards (ENs) and, once accepted, it is their responsibility to implement European Standards as national standards, to distribute and sell them and to withdraw any conflicting national standards. The national standards are

[281] http://www.iso.org/iso/about.htm

[282] http://www.cen.eu/cenorm/homepage.htm

prepared in the national languages. The prices of individual national standards vary from standard to standard and from country to country but a typical price would be €100.

CEN works closely with the European Committee for Electrotechnical Standardization (CENELEC), the European Telecommunications Standards Institute (ETSI), and the International Organization for Standardization (ISO).

ISO TC 59 Building and civil engineering works

The ISO TC 59 is mainly focused on environmental care, economic and social benefits, and generally speaking, on sustainable construction methodologies. Therefore, the review and implementation of this standard will be of great importance in the construction sector. Specifically, ISO TC 59 will support EU Ecolabels and GPP criteria for environmental issues, concerning: environmental declarations of building products, design life of buildings, durability, responsibilities of private actors and public authorities, and guidelines in designing accessibility for all.

Existing documents and those under development are:

- ISO 15392:2008: Sustainability in building construction. Sets general principles.
- ISO/TS 21929-1:2006 Sustainability indicators. Sets the framework for development of indicators for buildings.
- ISO 21930:2007 Environmental declaration of building products.
- ISO 21931-1:2010 Framework for methods of assessment of the environmental performance of construction works.
- ISO/NP TS 12720 Sustainability in building construction. Sets the guidelines for the application of the general principles on sustainability.
- ISO/DIS 21929-1 Sustainability indicators. Sets the framework for the development of indicators and a core set of indicators for buildings.
- ISO/CD 21929-2 Sustainability indicators. Sets the framework for the development of indicators for civil engineering works.
- ISO/DTR 21932 Building construction. Sets sustainability in building construction and Terminology.

ISO TC 205 Building environment design

ISO TC 205 aims to create a system of International Standards that address the 'built environment'. The main areas of work covered by ISO TC 205 are:

- Design of energy-efficient buildings
- Building control systems design
- Indoor air quality
- Indoor thermal environment
- Indoor acoustical environment
- Indoor visual environment

The most important standards (including those under development) are:

- ISO 16813:2006 Building environment design, Indoor environment - sets general principles.
- ISO 16814:2008 Building environment design, Indoor air quality - sets methods of expressing the quality of indoor air for human occupancy.
- ISO 16818:2008 Building environment design, Energy efficiency - sets Terminology
- ISO 23045:2008 Building environment design - sets guidelines to assess energy efficiency of new buildings.
- ISO/DIS 13153 Framework of the design process for energy-saving single-family residential and small commercial buildings with the energy consumption ratio as a criterion.
- ISO/DIS 16817 Building environment design, Indoor environment, design process for visual environment.

CEN TC 350 - Sustainability of construction works

The CEN TC 350 deals with the development of voluntary horizontal standardized methods for the assessment of the sustainability aspects of new and existing construction works and with standards for the environmental product declaration of construction products. The standards will be generally applicable (horizontal) and relevant for the assessment of integrated performance of buildings over its life cycle. The areas of concern are: economic performance assessment of buildings, social performance assessment of building, products level, and environmental performance of buildings, building Life Cycle Description, developed by the following standards:

- CEN/TR 15941:2010 Sustainability of construction works, Environmental product declarations. Sets the methodology for selection and use of generic data.
- EN 15643-1:2010 Sustainability of construction works, Sustainability assessment of buildings. Sets the general framework.
- EN 15643-2:2011 Sustainability of construction works, Assessment of buildings. Sets the framework for the assessment of environmental performance.
- prEN 15643 Sustainability of Construction Works, Assessment of Buildings. Sets the framework for the assessment of social performance.
- prEN 15643-4 Sustainability of Construction Works, Assessment of Buildings. Sets the framework for the assessment of economic performance.
- FprEN 15978 Sustainability of construction works, Assessment of environmental performance of buildings.
- FprEN 15942 Sustainability of construction works, Environmental product declarations.
- prEN 15804: Sustainability of construction works. Assessment of social performance of buildings

According to this standard, a change in the application and calculation of the LCA for buildings is proposed. Its purpose is to provide guidelines for a quantitative evaluation of the environmental performance of new and existing buildings based on a life cycle approach.

The approach to the assessment covers all stages of the building life cycle (with the exception of dangerous substances which is covered by TC351) and is based on data obtained from Environmental Product Declarations (EPD), their "information modules", and when appropriate other information related to the environmental performance of the building as a whole and to construction products, processes and services, over the life cycle of the building.

CEN/TC 351

CEN established a new technical committee (TC 351) in 2007 to undertake the work of developing harmonized standards concerning release of regulated dangerous substances to soil, water and air and it established a working group (WG 2) specific to indoor air. By harmonising testing standards, tests can be reliably reproduced in on the same product in different laboratories. Currently, testing is undertaken in accordance with ISO 16000 but this has been found to be imprecise, particularly with regard to sample preparation. The new harmonisation will accordingly build upon ISO 16000[283].

CEN-TC 264 - Air quality

This committee is concerned with air pollution control and standards for characterization and measurement of different pollutants in the air, both indoors and outdoors, and is also dealing with methods for source characterization.

ISO 14000

A growing awareness of the impact of buildings on the environment has created a greater need to take account of environmental factors. To address this effectively, the environmental impact of a building has to be a primary consideration of the design team. Two approaches are available to the design team to provide clients with assurance that ecological design principles are carried through to construction. These are the international environmental management systems standard, ISO 14001, and the slightly older approach of eco-labelling.

Development of the “ISO 14000 family” set of standards began in 1996 and continues. The focus is often on ISO 14001 because this is the specification and guidance for use of environmental management systems (EMS). An important contrast to eco-labelling is that it is not a product standard and ISO actively discourages attempts by organizations to use their certification in this way.

[283] Eco-Institut website, accessed: http://www.eco-institut.de/en/from-analysis-to-quality-assurance/cen-tc-351/question-and-answers-concerning-the-horizontal-testing-method/#c1914

'Environmental management' in the context of ISO 14000 deals with what an organization does to minimize harmful effects on the environment caused by its activities. Within the ISO 14000 family, there are sets of standards specifically aimed at:

- Environmental management systems (14001 and 04)
- Environmental auditing (14010, 11, 12, 15)
- Environmental labelling (14020, 21, 22, 24, 25)
- Environmental performance evaluation (14031, 32)
- Life cycle assessment (14040, 41, 42, 43, 48, 49)

Within the ISO 14000 family one of the most relevant factors is the presence of a set of standards specifically aimed at life cycle assessment (LCA). LCA aims to analyse the environmental impacts of a material from "cradle to grave". Full LCAs have four stages, which are: goal definition, inventory, impact analysis and valuation. The accuracy or usefulness of LCA depends on accurate and available data on both a global and local basis for each stage. LCA also needs a clear definition of system boundaries which, in itself, raises questions as to whether those boundaries have been set appropriately. Despite the potential problems of LCA, it is still an extremely useful technique and therefore one that sits well within the ISO 14000 family.

Even though very few construction companies have actively pursued certification, construction industry has been found to be the fifth highest growth area for certification. Whatever the number of individual companies currently certificated, certification is being actively pursued. The five countries most actively pursuing the ISO 14000 standard (Japan, UK, Sweden, Spain, Australia and the USA) include three European countries. For instance, according to the ISO survey of ISO 9000 and ISO 14000, in the year 2000 the UK accounted for over 10% of worldwide ISO 14000 certificates.

Annex 4 National Legislation/Guidance/Action Plans

Austria

The Austrian Federal Act on the protection of man and the environment from chemicals (Chemicals Act 1996 - ChemG 1996) BGBl. I Nr. 53/1997 idF BGBl. I Nr. 88/2009 deals with direct and indirect harmful effects. These may be caused by the manufacture and marketing, acquisition, use or waste treatment of substances, preparations or finished products of substances, no specific reference is made to construction products by this law[284] and it is therefore not considered further in this report.

Belgium

In the Brussels Capital Region the Regional Ministry of Environment has regulated buildings and construction products with a legislative text on the energy performance and indoor air quality of buildings from 14/05/2009. IBGE/BIM and the ABEA are responsible for the execution of the implementation.

Bulgaria

No relevant legislation has been identified.

Cyprus

Stakeholder consultation suggests that no relevant legislation exists in Cyprus.

Czech Republic

In addition to the requirements established under the CPR[285], safety of construction products is governed by Government Decree 163/2002[286]. This law requires that buildings should be safe for residents and neighbours, including release of toxic/dangerous gases and particles. However, this Decree appears not to contain any requirements on specific substances.

Denmark

No relevant legislation has been identified.

[284] http://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10011071
[285] See http://www.itczlin.cz/cz/stavebni-vyrobky
[286] See http://www.vups.cz/download/Y1_NV-163_2002+312_2005_fin_AO227.pdf

Estonia

Consultation suggests that no mandatory schemes are in force in Estonia.

Finland

No relevant legislation has been identified.

France

No relevant legislation has been identified.

Germany

Some restrictions and prohibitions on the content of dangerous substances in construction products, and on the emission of dangerous substances from construction products, are laid down in the Prohibition of Chemicals Ordinance (Neufassung der Chemikalien-Verbotsverordnung). These include restrictions covering formaldehyde, synthetic mineral fibres as well as certain polychlorinated and polybrominated dibenzo-p-dioxins and dibenzofurans. A revision of the ordinance is foreseen in near future.

In Germany there are also national limit values affecting the construction industry, e.g. those for recycled wood for use in wood-based panels are given in the Waste Wood Ordinance and limit values for recycled aggregates are included e.g. in the national standard DIN 4226-100.

The German Model Building Code (Notification 2002/467/D) requires that construction works shall not endanger human health and natural resources. Only when the required level of protection in terms of human health is achieved, may construction products be used or applied. The approach of the Model Building Code is not restricted to dangerous substances covered in regulation, but includes all harmful impacts of the substances used in a product on human health and the environment.

The Principles of health assessment of construction products in indoor environments of the Deutsches Institut für Bautechnik provide a guideline for the implementation of the Model Building Code for the protection of human health.

The Principles for assessing the effects of construction products on soil and groundwater of the Deutsches Institut für Bautechnik provide a guideline for the implementation of the Model Building Code for the protection of soil and groundwater. The assessment criteria are derived, where available, from the 'insignificance thresholds' for groundwater (Geringfügigkeitsschwellenwerte für das Grundwasser) established by LAWA (Working Group of the German Länder on Water Issues). These principles have been applied so far mainly for construction products not covered by the CPD. However, certain concrete constituents, such as fly ash, may only be used if approved according to these principles.

The relevant legislation is dealt with in more detail below.

Table A3.1: Principles for health assessment of construction products for interiors	
Name	Deutsches Institut fuer Bautechnik (German Institute of Construction Technology) Principles for health assessment of construction products for interiors
What is the primary objective of the legislation?	Public health (protection of health of people that spend time inside buildings)
Is the legislation, regional, national, international?	National
In what form does communication of conformity to the legislation take place?	Producer declaration or certificate issued by a certification body
Is the legislation focused only on construction products?	Yes, this document lays down the general principles for all construction products but also provides requirements on specific construction products (flooring and adhesives)
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Yes, either by listing them (VOCs and SVOCs) or specifying categories of substances specified in other documents (e.g. EU legislation) that should not be used in construction products
What performance requirements must be fulfilled to ensure conformity to the legislation (e.g. emissions below specified level, content below specified concentration, certain substances excluded)?	Ban on use of certain substances and limit values on emissions of others
How is conformity with the legislation ascertained?	Product approval process by the authorities involving producer declaration or third-party testing
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	N/A

Table A3.1: Principles for assessment of the effects of construction products on soil and groundwater	
Name	Principles for assessment of the effects of construction products on soil and groundwater[287]
What is the primary objective of the legislation?	Environmental protection
Is the legislation, regional, national, international?	National
In what form does communication of conformity to the legislation take place?	Not known. However, (if possible) the manufacturer provides a list of contents to the authority as a part of the approval process

[287] See http://www.dibt.de/de/data/Aktuelles_Ref_II_4_6.pdf

Table A3.1: Principles for assessment of the effects of construction products on soil and groundwater	
Is the legislation focused only on construction products?	Yes, this document lays down the general principles for all construction products but also provides requirements on specific construction products (cement and raw materials for the production of cement)
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Partly
What performance requirements must be fulfilled to ensure conformity to the legislation?	Absence of specific substances (substance groups) as well as compliance with a number of tests (e.g. pH value, smell, discolouration, insignificance thresholds, etc.)
How is conformity with the legislation ascertained?	Product approval process by the authorities
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	N/A

Table A3.2: Evaluation system for sustainable construction for governmental buildings (BNB)	
Name	Evaluation system for sustainable construction for governmental buildings (BNB)[288]
What is the primary objective of the legislation?	Sustainable development
Is the legislation, regional, national, international?	National but only applicable to new office buildings of the federal government
In what form does communication of conformity to the legislation take place?	N/A
Is the legislation focused only on construction products?	No, a range of sustainability-criteria are taken into account, including socio-economic criteria, and takes into account the use of the building as well.
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Document 1.1.6[289] lists substance categories that assessments should focus on, including organic solvents, substances of very high concern under REACH/CLP, biocides, heavy metals, etc.

[288] See http://www.nachhaltigesbauen.de

[289] See http://www.nachhaltigesbauen.de/fileadmin/pdf/BNB_Steckbriefe_Buero_Neubau/aktuell/BNB_BN_116.pdf

Table A3.2: Evaluation system for sustainable construction for governmental buildings (BNB)	
What performance requirements must be fulfilled to ensure conformity to the legislation?	The scheme includes a large catalogue of criteria. The criteria 1.1.6 and 3.1.3 address also product specific effects on the local environment and the quality of indoor air. In particular, 1.1.6 includes many specific requirements to reduce the use of dangerous substances in specific product groups.
How is conformity with the legislation ascertained?	-
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	N/A

Table A3.3: Technical terms of delivery for aggregates in road construction	
Name	Technical terms of delivery for aggregates in road construction
What is the primary objective of the legislation?	Environmental protection
Is the legislation, regional, national, international?	National
In what form does communication of conformity to the legislation take place?	Conformity declaration[290]
Is the legislation focused only on construction products?	Yes, it deals specifically with aggregates
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Not known, although it is clear that this document specifies requirements on the content of calcium hydroxide
What performance requirements must be fulfilled to ensure conformity to the legislation?	The scheme has the intention to promote the use of recycled materials in road construction, but also to assure that their environmental and technical quality is adequate
How is conformity with the legislation ascertained?	Self-determination by the producer
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	N/A

[290] See http://www.eifelinstitut.de/download/03-Ritter.pdf

Table 3.4: Technical terms of delivery for civil engineering works	
Name	Technical terms of delivery for civil engineering works
What is the primary objective of the legislation?	Environmental protection
Is the legislation, regional, national, international?	National
In what form does communication of conformity to the legislation take place?	Not known
Is the legislation focused only on construction products?	Not known
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Not known
What performance requirements must be fulfilled to ensure conformity to the legislation?	Ensuring that hat the materials that are used in contact with soil do not contain hazardous substances
How is conformity with the legislation ascertained?	Not known
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	N/A

Table 3.5: Guidelines on the sanitary assessment of organic coatings in contact with drinking water	
Name	Guidelines on the sanitary assessment of organic coatings in contact with drinking water[291]
What is the primary objective of the legislation?	Public health: ensuring that materials used for drinking water installations do not contain and / or release substances hazardous to health
Is the legislation, regional, national, international?	National
In what form does communication of conformity to the legislation take place?	Test certificate
Is the legislation focused only on construction products?	This Guideline focuses specifically on coatings that come into contact with water intended for human use (drinking water)
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Yes, specific substances as well maximum test values are given in the Guideline

[291] See http://www.umweltbundesamt.de/wasser-e/themen/downloads/trinkwasser/beschichtungsleitlinie.pdf

Table 3.5: Guidelines on the sanitary assessment of organic coatings in contact with drinking water	
What performance requirements must be fulfilled to ensure conformity to the legislation?	Maximum tolerable migration rates or residual concentrations for individual substances in the finished coating
How is conformity with the legislation ascertained?	Testing by an accredited laboratory
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	N/A

Greece

No relevant legislation has been identified.

Hungary

No relevant legislation has been identified.

Iceland

No relevant legislation has been identified.

Ireland

Life Cycle Assessment tools can be used to encourage the development of sustainable and healthy products. This involves the use of materials which satisfy health and safety standards and the elimination of toxic materials.

Italy

In Italy planning and building control, as well as sustainability aspects of construction are determined by each of the 20 regions. The regions are subdivided into provinces, and these into municipalities which implement their own building regulations, with their own sustainable building codes (norme per l'edilizia sostenibile) which are based on regional guidelines. Certain elements are integrated from national laws and decrees, for example general criteria on safety and loading, reinforced concrete and steel structures, brickwork and provisions for seismic areas. There are also some rules at the national level for specific types of buildings – for example schools, hospitals and public housing.

For sustainability issues, the regions and Comuni variously introduced their 'norme per l'edilizia sostenibile' (standards for sustainable building) mainly until 2009. This situation has shown to be difficult to manage in many occasions, for example when transposing European Directives.

Some sort of coordination was proposed by ITACA (Istituto per la Trasparenza L'aggiornamento e la Certificazione degli Appalti), a central government body for coordination of the regions. They proposed a 'protocol for evaluation of environmental sustainability' but even this approach has not been adopted in all regions. The methodology of the protocol establishes 12 criteria and 8 sub-criteria under two headings:

1. Use of resources: summer energy conservation; hot water; natural lighting; renewable energy sources; eco-compatible materials (including renewable and recycling/recovered materials); potable water and maintenance of the services of the building envelope
2. Environmental impact: emission of GHG; solid wastes; liquid effluents and permeability of external areas

In 2009 a draft law on 'Building Quality' was drawn up ('Sistema casa qualità') which was finally approved in 2012 (Legislatura 16ª - 13ª Commissione permanente - Resoconto sommario n. 348 del 29/05/2012). This superseded the regional codes on sustainable building. Amongst other provisions, it required houses to fulfill a number of requirements and assigning the detailed technical requirements to UNI standards (mainly implementing EN standards) or international ISO standards. The proposed evaluation procedure is based on energy efficiency, water saving, comfort and eco-friendly materials. The law sets specific guidelines for the calculation method and the minimum requirements of 'Building Quality'.

The requirements for materials are based on:

- Article 7: one of the prerequisites to show comfort is that materials are awarded the CE mark
- Article 8: (evaluation of the fulfillment of the requirements of eco-friendly materials and construction products) indicates that components, products and materials used in construction are evaluated and classified according to their environmentally friendly compliance and estimated life-cycle (including through certified environmental product declarations), ensuring the sustainable use of natural resources. Most of the methodologies proposed are based on the work developed at the CEN TC 350
- In the security part of the law, criteria related to migration of elements to water and on VOC emission from materials are also set. It also includes regulations on the reduction of toxic emissions and harmful materials, elements and components as one of the prerequisites of the UNI 11277, 2008 standard.

Latvia

Consultation suggests that no mandatory schemes are in force in Latvia.

Lichtenstein, Lithuania and Luxembourg

No relevant legislation has been identified.

Malta

Technical standards/codes currently being used are those adopted in the UK. There is a new waste strategy but nothing related to the content of hazardous substances in construction products.

The Netherlands

The Buildings Decree 2012 contains the minimum requirements for all structures in Netherlands. They relate to safety, health, usability, energy efficiency and the environment. The Building Decree was introduced in 2012, bringing with it a focus on the sustainability of the interior environment and energy efficiency of buildings. More specifically, it has provisions related to:

- Determination of environmental performance of buildings and civil engineering works;
- The compulsory separation of construction and demolition waste;
- The tightening of thermal insulation limits;
- The introduction of energy requirements on an area basis; and
- Limiting the noise levels of climate control equipment.

Table A3.6: Particleboard and Chipboard Decree [292]	
Name	Chipboard (Commodities Act) Decree (*Spaanplaatbesluit Warenwet*)
What is the primary objective of the legislation?	
Is the legislation, regional, national, international?	For the purpose of public health to establish requirements with respect to particle board
In what form does communication of conformity to the legislation take place?	
Is the legislation focused only on construction products?	Applies to particleboard, defined as a plate consisting of small particles of wood or other lignocellulosic materials with an organic binder bound together. Specifically those that contain articles.
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Formaldehyde sheet
What performance requirements must be fulfilled to ensure conformity to the legislation?	Chipboard/particleboard per 100g must contain no more than 10mg formaldehyde sheet.
How is conformity with the legislation ascertained?	
Any other information related to the legislation that may be useful?	This technical standard differs from those of other EU Member States. If a type of chipboard is already permitted in other EU Member States, the Dutch government may only prohibit its sale in the Netherlands in exceptional cases.

[292] http://wetten.overheid.nl/BWBR0004021/geldigheidsdatum_17-04-2013

Table A3.7: Board for the Authorisation of Plant Protection Products and Biocides	
Name	Plant Protection Products and Biocides Act 2007
What is the primary objective of the legislation?	To protect humans, animals and the environment from the harm posed by pesticides. It has also implemented the Crop Protection Directive (91/414/EEC) and the Biocides Directive (98/8/EC) so as the authorisations at national level can take place on the basis of European regulations, thus harmonising European legislation.
Is the legislation, regional, national, international?	National
In what form does communication of conformity to the legislation take place?	
Is the legislation focused only on construction products?	No. Wood products that may be treated with a preservative to protect it from rotting or being damaged by insects.
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Before being used, the pesticide must be authorised by the autonomous board for the authorisation of plant protection products and biocides (Ctgb). Decisions are made after taking into consideration the policy of five ministries: Economic Affairs; Infrastructure and environment; Health, welfare and sports; Social affairs and employment; and Transport, Public Works and Management.
What performance requirements must be fulfilled to ensure conformity to the legislation?	
How is conformity with the legislation ascertained?	Substance may not be used until it has been authorised.
Any other information related to the legislation that may be useful?	From September 2013, a new European Biocidal Regulation will apply. When enacted, the European Commission will decide the admission of certain active substances in the EU. However, individual Member States will still have to authorise products that contain this substance.

Norway

Norway established The Product Register (PR) in 1981. PR operates the authorities' central register of substances and chemical products (chemicals). The information is used as a tool for preventing damage to health and the environment caused by chemicals. PR currently holds information on more than 25 000 products. Data from PR are used in various ways, for instance:

- by the authorities in control and inspection of product labelling and in risk assessment of particular types of substances or products.
- by the National Poison Information Centre to provide advice and instruction in connection with acute poisoning.
- by the Product Register to provide statistics that can be used by the authorities in controlling the flow of chemicals.

Table A3.8: Law on the Control of Products and Consumer Service (Product Control Act)[293]	
Name of Scheme, legislation, programme (hereafter scheme)	Law on the Control of Products and Consumer Services (Product Control Act)
What is the primary objective of the scheme	To replace hazardous chemicals with less dangerous alternatives. The principle of substitution seeks to Reduce the risk to health the environment posed by these products; Shift more responsibility to those who handle products that contain hazardous substances; Highlights to users how selecting the right product can help to prevent damage to health and the environment; Oblige those who use such products for the purpose of occupation to make systematic efforts to find substitutes for dangerous chemicals; and Ultimately, to replace hazardous chemicals with less dangerous substances and reduce the use of hazardous substances[294].
Is the scheme, regional, national, international? If international, what other countries does the scheme operate?	National
In what form does communication of conformity to the scheme take (e.g. is a label affixed to the product, certification accompanies product)?	
Is the scheme focused only on construction products? Group of Construction Products to which the scheme applies (e.g. Wood, PVC, Concrete)?	No. It applies to production, processing of products and other services. It applies to all enterprises that use products that contain hazardous substances
How does the scheme define those chemicals/substances that are regulated (e.g. refers to legislation, lists specific substances)?	With reference to the objectives of the provision. It applies to those products that present a health danger, cause environmental damage or an environmental disturbance.
What performance requirements must be fulfilled to ensure conformity to the scheme (e.g. emissions below specified level, content below specified concentration, certain substances excluded)?	Businesses that use products containing chemical that can cause effects noted in the objective of the scheme shall consider whether there are alternatives that entail less risk of such effects. Provided it can be done without unreasonable expense or inconvenience, the business must then choose this option.
How is conformity with the scheme ascertained? Third party assessment based on information received from suppliers or do suppliers attest that their products conform to pre-defined qualifying criteria?	Those infringe this act will be criminally liable.
Any other information contained within studies related to the scheme that may be useful (e.g.	

[293] http://www.lovdata.no/all/hl-19760611-079.html
[294] http://www.klif.no/publikasjoner/kjemikalier/2007/ta2007_00.html

Table A3.8: Law on the Control of Products and Consumer Service (Product Control Act)[293]	
number of applications, effectiveness of the scheme)?	

Nordic Countries[295]

The Nordic Council of Ministers consists of several specialised ministers that meets between one and five times and year. There is also a number of working groups, one of which includes the Nordic Chemical Group (NKG). Operating under the auspices of the Nordic Council of Ministers for the Environment, the NKG seeks to minimise negative health and environmental effects from chemicals in products, emissions and waste. As part of this, there are four databases:

- The Nordic Substance Databases (NSDB): Lists substances that may potentially be considered a priority substance in regulatory regimes;
- Substances in Preparations for Nordic Countries (SPIN): Based on data from the Products Registries of Norway, Sweden, Denmark and Finland, SPIN is a database on those substances that are used in products in the Nordic countries. However, unlike the product register, confidential data has not been included on the SPIN database;
- H-Class database: This includes substances that have been discussed or are being discussed by the European Commission. There does not necessarily need to sufficient evidence or information that substances are indeed dangerous. Although the database is primarily concerned with substances that have health effects, substances other chemical properties may also be included;
- N-Class database: This database includes substances that have been discussed or are being discussed by the European Commission for environmental effects. Again, the substance may not have been definitively proved as dangerous.

Poland

To encourage investment in infrastructure, the Polish government reformed the Construction Code and its related laws. More specifically, they sought to make builders responsible for the safety and sustainability of their works and reduce the administrative decisions taken by authorities.

Portugal

Portugal has a complicated administrative and territorial organisation structure based on 308 municipalities grouped into several top-level divisions with various functions. Some are purely administrative, others more technical and other historical and cultural. This leads to the fact that for building projects the agencies involved are: city hall, labor conditions agency, water and sewerage authority, Autoridade Nacional de Comunicaçoes and telecommunications authority.

[295] http://www.norden.org/en

The Portuguese building regulations system has undergone significant changes in the last decades. Almost all building regulations currently in force have been approved during the last 20 years. The objective has been to move away from public building control and to make private parties responsible for compliance with building regulations. There are still two structural problems; firstly building regulations continue to be complex and fragmented, and secondly the qualifications of technicians are still not adequately defined.

In Portugal there is no single Building Act which serves as a legal basis for building regulations and procedures, and defines the duties and responsibilities of the parties involved. The general building regulation is the main national building regulation, which sets out general provisions for building, regarding construction, health, safety, and aesthetics (Decree-Law no. 38382 OJ (PT) August 7, 1951). In addition, there are more than 45 national building regulations and other regulatory documents that focus on specific requirements. Almost all of these building regulations and regulatory documents were produced during the last two decades. Some of these building regulations have been the consequence of implementing European Directives[296], while others have been changed due to advances in scientific knowledge.

There are no building regulations at the regional level within the Portuguese continental territory. However, the two autonomous regions of Azores and Madeira can approve regional regulations and are also entitled to adapt the building regulations approved by Central Government to local circumstances. There are also municipal building regulations which complement national ones. These deal with subjects of municipal competence and local traditions and uses. As a result, Portuguese building regulations are complex and fragmented. The Architects Association[297] described Portuguese building regulations as chaotic, claiming that they are scattered across about 1,000 legal documents. These characteristics make it difficult to have a comprehensive knowledge of the building regulations and to apply them.

Construction works carried out in buildings constructed under a previous regulatory framework do not have to comply with supervening building regulations. This general principle is not observed in cases where the supervening regulations explicitly include existing buildings in their scope; in fact, this only happens in exceptional situations such as to ensure minimum levels of safety[298], comfort[299], or accessibility[300].

296 Council Directive no. 95/16/EC (lifts), 2002/49/EC (management of environmental noise), 2002/91/EC (energy performance of buildings), etc.

297 Architects Association (2006), Appraisal About the Pre-project to Review the General Building Regulation, Architects Association, Lisbon.

298 Decree-Law no. 521/99 [standards for design of gas services to include in construction, enlargement or reconstruction designs of buildings, and regimen applicable to services inspection] OJ (PT) December 10, Art 13.

299 Decree-Law no. 78/2006 [national system of energy certification and indoor air quality in buildings] OJ (PT) April 4, Art 3.

300 Decree-Law no. 163/2006 [technical standards of accessibility to buildings and establishments receiving public, public ways and residential buildings] OJ (PT) August 8, Art 9.

For the scope of this study, no information is available at national regulatory level on specific requirements for construction materials.

Romania

No relevant legislation has been identified.

Slovakia

The following legislation has been highlighted by consultation: Act on construction products (69/2009)[301] and Decree on construction products (Predpis č. 558/2009)[302]. The Act lays down conditions for the marketing of construction products while the Decree establishes a list of groups of construction products and systems for assessing the parameters thereof. However, as these laws appear not to deal with the regulation of specific substances in construction products, these are not considered further in this report. Please also note that regulation of construction products in Slovakia is currently under revision with a new law (which will implement the CPR) is under development[303].

Slovenia

Table A3.9: Slovenian Construction Act	
Name	Construction Act (Zakon o graditvi (ZGO-1))
What is the primary objective of the legislation?	Regulates the conditions for construction works
Is the legislation, regional, national, international?	National
In what form does communication of conformity to the legislation take place?	Mandatory. It must be complied with.
Is the legislation focused only on construction products?	Applies to works – (buildings or civil engineering fixed to the ground and made of construction products/natural materials/inbuilt installations/technical fittings).
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Refers to dangerous substances
What performance requirements must be fulfilled to ensure conformity to the legislation?	Article 38: The project documentation for the reconstruction or removal of works must also contain documentation on the measures to prevent the emission of dust and other dangerous substances and on the management of construction waste.

[301] See http://www.build.gov.sk/mvrrsr/source/document/003876.pdf
[302] See http://www.zakonypreludi.sk/zz/2009-558
[303] See http://www.webnoviny.sk/ekonomika/kabinet-schvalil-navrh-zakona-o-stave/624143-clanok.html

Table A3.9: Slovenian Construction Act	
How is conformity with the legislation ascertained?	Legislation must be adhered to.

Spain

Planning and building control in Spain is the responsibility of 17 autonomous communities and is exercised by thousands of local authorities (town halls), grouped into 52 provinces. Although local authorities are able to add new requirements, this is not common. The construction industry is regulated by the "Ley de Ordenación de la Edificación" (LOE) or Building Act (Ley 38/1999), modified in 2001 and 2002, which applies to new builds, refurbishments/extensions, urban infrastructure and building services. Within the LOE, Article 3 sets out the basic requirements for buildings. This led to the government drawing up the technical building code Código Técnico de la Edificación (CTE), which is the comprehensive set of technical regulations and standards for building. The CTE was established by Royal Decree (RD 314/2006) and it is a detailed set of documents. Sections include:

- Part 1: basic requirements for performance;
- Part 2: a series of volumes ('documentos básicos' – DB) relating to each of the basic requirements. These DB volumes contain verification procedures, technical rules and examples of solutions deemed satisfactory.

The CTE in turn is supported by 'Recognised Documents'. These documents are not regulations but are approved by national authorities and include specifications, technical guides or codes of good practice, evaluation methodologies, building solutions, IT programs, statistical databases, etc. The CTE also includes standard procedures based on national or internationally recognised organisations (ENAC, CEN, ISO, etc.).

In addition to the CTE, there are some mandatory basic technical regulations, including those relating to pre-stressed concrete, standards for earthquake resistant construction, regulations on heating apparatus, and regulations on industrial safety.
Basic requirements specified in the LOE include: functionality, safety/security and habitability. Sustainability is not specifically listed, but it is included in the sections relating to protection of the environment and conservation of energy. Part 2 of the CTE sets more specific requirements under the following sections (documentos básicos):

- Safety objectives:
  - DB SE Structural Safety: General principles
  - DB SE AE Structural Safety: Actions
  - DB SE C Structural Safety: Foundations
  - DB SE A Structural Safety: Steel structures
  - DB SE F Structural Safety: Masonry structures
  - DB SE M Structural Safety: Timber structures
  - DB SI Safety in case of fire
  - DB SUA Safety in use and accessibility

- Habitability objectives:
  - DB HS Health, hygiene and protection of the environment
    - HS1 Protection against humidity
    - HS2 Collection and disposal of wastes
    - HS3 Quality of interior air
    - HS4 Water supplies
    - HS5 Waste water
  - DB HE Energy saving and thermal insulation
    - HE1 Reduction of energy demand
    - HE2 Efficiency of thermal installations
    - HE3 Energy efficiency of lighting
    - HE4 Minimum solar contribution of sanitary hot water
    - HE5 Minimum photovoltaic contribution of electrical energy
  - DB HR Noise protection

The CTE includes the requirement for some products to have the CE mark. For the specific scope of this study it has to be considered that all the sections set specific criteria for materials. Their main purpose is to promote functionality and use, but in several cases hazardous substance content (for example when dealing with pipes and other materials in contact with water) and emission of substances (for example formaldehyde emission) are considered. It is notable that with the implementation of the CTE, Spain became one of the first countries in Europe to make minimum solar energy requirements mandatory.

In additional to the national regulations for buildings there are some municipal requirements, for example solar thermal obligations in Barcelona and Madrid, which continue to apply, provided they are stronger than the national legislation. The Catalonian Government has a Decree regulating the environmental and building eco-efficiency criteria (Generalidad de Cataluña Decreto 21/2006). This methodology is widely used by a large number of companies, and is complementary to the government building regulations.

Sweden

Table A3.10: Environmental Quality Objectives[304]	
Name	15 objectives were enacted in 'Government Bill 1997/98:145, Swedish Environmental Quality Goals An Environmental Policy for A Sustainable Sweden'. 'Government Bill 2004/05:150 Environmental Quality Objectives – A Shared Responsibility was adopted in 2005', where an additional objective on biodiversity was added.

[304] http://www.kemi.se/en/Content/A-Non-toxic-environment/The-objective-A-Non-Toxic-Environment/

Table A3.10: Environmental Quality Objectives[304]	
What is the primary objective of the legislation?	There are 16 environmental quality objectives that if met, will ensure that the next generation can take over a society in which the major environmental problems have been solved. They have been framed in a way that they are achievable. One of the objectives is for a Non-Toxic Environment. The Swedish Parliament has outlined six specifications related to this subject: Total exposure to chemical substances; Use of particularly dangerous substances; Unintentionally produced substances with hazardous properties; Contaminated sites; Knowledge about the environmental and health properties of chemical substances; Information about dangerous substances in materials and products.
Is the legislation, regional, national, international?	National. The Swedish Chemical Agency (KEMI) is responsible for fulfilling this objective.
In what form does communication of conformity to the legislation take place?	This is a target that has been set by the Swedish Government. KEMI performs a supervisory role working towards fulfilment of this target. As part of this, some of its roles include: keeping a product register; Maintaining a number of databases; Assisting with the development of EU wide chemical and product legislation to assess and limit the risks associated with chemicals in articles and chemical products; Checking compliance with regulations.
Is the legislation focused only on construction products?	The target is applicable to all products in order to help fulfil the objective of a Non-Toxic Environment. Under the product register, companies that report construction products with chemicals must register them in a more specific way, detailing what type of buildings the products will be used in. This will help to build a better understanding of what buildings chemicals are used in. Products will now be registered under one of the following: Construction of buildings; Civil engineering; and Specialised construction activities.
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	KEMI manages The Restricted Substances Database, which lists rules on prohibitions and restrictions in relation to the substances that are banned in Sweden.
What performance requirements must be fulfilled to ensure conformity to the legislation?	KEMI actively performs inspections to ensure products conform to the applicable legislation.

Table A3.10: Environmental Quality Objectives[304]	
How is conformity with the legislation ascertained?	KEMI performs a supervisory role.
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	Currently, taking into account the current mandatory and voluntary instruments planned or implemented in Sweden, the Non-Toxic Environment objective will not be fulfilled by 2020. One of the major factors impacting the fulfilment of a Non-Toxic environment is the globalization of production and trade. Whilst the use of dangerous substances needs to be reduced, the demand for chemical products is growing.

Other legislation identified in Sweden appears not to be directly relevant to this project, including:

- The Planning and Building Act, The Act on Technical Requirements for Construction Works, etc. The Act on Environmental Code with ordinances of relevance (implements CPD)[305]; and
- Planning and Building Act, Swedish Environmental Code.

In addition, the Swedish Chemicals Agency undertook a pilot project to see whether the implementation of hazard classifications influenced the use of chemicals. Data from the Swedish products register and Nordic SPIN database was used to analyse whether there had been a change in the use of dangerous substances in products. The results of the pilot study showed that there was a decrease in the number of substances used in products following classification as dangerous under the CLP. It would seem that providing information on hazardous substances encourages their substitution for less hazardous substances[306]. – Hence the Swedish product register works.

United Kingdom

Building Regulations in the UK set functional requirements on the performance of controlled works. Building regulations and standards are not prescriptive about which products may or may not be used, and they do not require declarations relating to dangerous substances.

The functional requirements of the England and Wales Regulations are set out in Schedule 1 to the Building Regulations 2010. Several of the requirements deal with matters which fall under CPD Essential Requirement 3 "Hygiene, Health, and the Environment", including emission of dangerous substances. The statutory guidance recommends that these are dealt with by design solutions and none require declarations of emissions from products. For example:

[305] Accessed at: https://wcd.coe.int/Comm.instranet.InstraServlet?command=Comm.instranet.CmdBlobGet&InstranetImage=1279003&SecMode=1&DocId=1427506&Usage=2

[306] Accessed at http://www.norden.org/en/publications/publikationer/2012-507/at_download/publicationfile

- Part D (Toxic substances): The guidance addresses release of formaldehyde from u-f insulating foams used as cavity insulation in masonry walls. The guidance suggests a design solution, namely prevention of ingress of formaldehyde by the requirement for a masonry inner leaf which separates the foam from the living space. No declaration of formaldehyde release is needed for u-f foam cavity insulation.
- Part C covers resistance to contaminants, and the guidance describes how to address emission of (for example) methane, radon and VOC's. The regulatory requirement only covers contaminants from the ground and not from construction products (whether subject to CE marking or not).
- Part J covers dangerous substances from combustion appliances. This applies only to the emission of combustion fumes during operation, not to the emission of dangerous substances from the materials from which the appliances are made.
- Part F covers ventilation. Guidance is provided on the provision of ventilation in new and refurbished buildings, and a suggested satisfactory level for total VOC exposure is set out in Appendix A. Source control is not within the main guidance of the Approved Document, but paragraph 4.30 notes that product labelling (e.g. on paints and wood-based panels) can be helpful in choosing products when good indoor air quality is a priority.

Under the Buildings (Scotland) Regulations 2004 also contains provisions on buildings in Scotland. However, the technical handbooks which provide guidance on conforming to the regulations (Domestic Handbook and Non-Domestic Handbook) do not appear to contain any provisions specifically related to the potentially hazardous content of construction products[307].

Other legislation identified by stakeholders includes the three sets of regulations that cover drinking water in the UK. These regulations should ensure that the introduction of products (or substances) will not adversely impact drinking water (Article 10 of Drinking Water Directive). For the various regulations, this is achieved by:

- Water Supply (Water Fittings) Regulations – determine the impact on water quality through testing and fitness for purpose of the product; and
- Water Supply (Water Quality) Regulations – approval is required for certain products which takes into all of the ingredients used to make the product via toxicity and testing;
- Private Water Supply Regulations (England, Wales, Scotland and Northern Ireland each having their own) – must conform to the latter regulations.

Relevant UK documents are described below.

[307] Accessed at http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech

Table A3.11: UK Building Regulations[308]	
Name	Building Regulations 1992, amended in 2002 and 2010. Related to the Building Regulations, Approved Document D1 is concerned with Cavity Insulation.
What is the primary objective of the legislation?	Building Regulations contain the rules for new construction as well as renovations to ensure that they are safe, accessible, limit waste and cause minimal environmental damage.
Is the legislation, regional, national, international?	National
In what form does communication of conformity to the legislation take place?	The Building Regulations must be complied with. Approved Documents provide practical guidance on the requirements within the Building Regulations. Although not mandatory, by fulfilling the requirements contained within an Approved Document, the requirements of the Building Regulation will have been met.
Is the legislation focused only on construction products?	Insulating material
How does the legislation define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Refers to toxic fumes.
What performance requirements must be fulfilled to ensure conformity to the legislation?	Reasonable precautions must be taken to prevent the permeation of toxic fumes from insulating material
How is conformity with the legislation ascertained?	Building regulations apply to most building work and it is Building Control Bodies (BCBs) who are responsible for ensuring compliance with the Building Regulations.
Any other information related to the legislation that may be useful (e.g. number of products applying to the legislation, effectiveness of the legislation)?	

Table A3.12: Sustainability Action Plan	
Name	Sustainability Action Plan 2012 – 2015.
What is the primary objective of this scheme?	To promote the best construction practices throughout the construction sector.
Is the scheme, regional, national, international?	National
In what form does communication of conformity to the scheme take place?	N/A
Is the scheme focused only on	The scheme is applicable to 'projects'. Construction products used within buildings or 'projects' will therefore fall within the remit of the scheme.

[308] Accessed at http://www.planningportal.gov.uk/uploads/br/BR_PDF_AD_D_2010.pdf

construction products?	
How does the scheme define those chemicals/substances that it regulates (e.g. refers to legislation, lists specific substances)?	Under the Theme 'do not pollute', relevant projects must include in the specifications performance criteria related to pollution. This means that certain materials will be not be permitted to be used on the project e.g. products with HFCs or high VOCs.
What performance requirements must be fulfilled to ensure conformity to the scheme?	N/A
How is conformity with the scheme ascertained?	N/A

Annex 5 Key Findings of Online Consultation

The key issues emerging from consultation are discussed below for each type of stakeholder.

Main Findings of Online Consultation

Stakeholders were contacted with a view to gathering further information on the number of products certified and the uptake of the scheme across Europe (this information has been incorporated into the report alongside the overview of the schemes). They were also asked to identify any specific health concerns related to the content of the construction products. With regard to the latter issue, it was reported that a benefit of these types of schemes is that they allow manufacturers to communicate conformity with industry standards to both consumers and professionals within the construction industry. Respondents noting the reciprocal benefits of such transparency, as it allows manufacturers to differentiate themselves from other products within the same product group and provides a degree of security to planners and architects, who can identify products with lower environmental and health impacts for use in buildings. One stakeholder specifically citing the Blue Angel as a scheme that architects have used to select products with reduced hazardous substances e.g. CMRs.

Scheme administrators noted that their schemes worked effectively and provided useful information about the uptake of the scheme across Europe. Interestingly, one scheme administrator compared its scheme the national legislation of a Member State, commenting that the latter was overly bureaucratic and hindered foreign SME's entering the market of that Member State.

In respect of the schemes themselves, testing bodies commented that they were very effective at meeting their objectives.

Information provided by REACH, legislation/mandatory schemes and voluntary schemes

Stakeholders were asked whether the schemes provided enough information on the hazardous content of construction products. One scheme administrator commented that with the exception of the mandatory German AgBB scheme, the lack of available information on the content of products necessitated the founding of their scheme. Similarly, it was noted that the information demanded by scheme administrators is selective and to some extent arbitrary, as it would appear to not be sufficiently based on what the user of the product wants to know.

Stakeholders commented that whilst schemes may have criteria to exclude certain hazardous substances, it will not always be easy to obtain the required information for

certain construction products. Where the construction product has used a mixture, REACH requires that the absence of specified dangerous substances be declared. This information will be readily accessible on the Safety Data Sheet that must be supplied with the mixture. Whereas if the construction product is an article under REACH, there is only a duty to communicate Substances of Very High Concern (see Article 33 REACH below). With this in mind, it was felt by stakeholders that the operation of these schemes would be much easier if there was a legal requirement to declare more substances (e.g. flame retardants and binders that are used in insulation plates in complex insulation systems).

One NGO stakeholder went further and stated that it would be better if these schemes did not merely' inform the consumer' and allow them to make a decision, but were more regulatory in nature and prohibited harmful substances. In essence, the NGO was of the view that these schemes did not offer enough of an incentive for manufactures to stop using potentially hazardous substance and clear-cut regulatory provisions should be introduced.

Main Findings (Construction Companies and Associations)

Construction companies were contacted to identify schemes and comment on their benefits to themselves and downstream users (clients, subcontractors etc.). The schemes that were noted were:

- BASTA;
- Blue Angel;
- BRE Environmental Assessment Method (BREEAM);
- Byggvarubedömningen (BVB);
- European Ecolabel;
- Swedish Green Building Council; and
- Nordic Swan.

Respondents noted that these schemes contributed to better working conditions for employees with regard to occupational health. Also related to health, these schemes allowed companies to identify products that would lower the possibility of the need for future decontamination (asbestos / PCB). Construction companies also believe that purchasers are prepared to pay a premium for completed buildings that present reduced health risks.

The success of schemes, whether content or emission related, is predicated on the supply of accurate information from the supplier to the downstream user. On this matter, construction companies commented that sufficient information is provided to them by SDS on the hazardous content of construction products.

However, it was noted that suppliers are often reluctant to carry out the extra work that is necessary to secure any additional information that is required by several of the schemes. Particularly as some construction products are complex and difficult to source information regarding its content. As a result, if the wrong supplier is used, information required for some of the schemes can be lacking. It is therefore important that a good dialogue is

established and that the supplier and construction company are clear about requirements. As noted by another respondent, much is down to the supplier and their good will. Of course, as acknowledged by one respondent, this inconsistency may be a result of organisations still learning the best way to fulfil the requirements and objectives of various schemes.

The information provided in the SDS by the supplier often negates the need for construction companies to provide any additional information to their downstream users. Although if required by a client for purposes of future reconstruction, decontamination or demolition of the building, information on the content of products and its location within construction works can be provided.

Main Findings (Member State Authorities)

Responses from Member States proved useful for gaining additional information on mandatory national schemes, notably in the Netherlands and Germany (incorporated into the main body of the report). A Swedish respondent also noted that the demand for schemes concerning the assessment of entire buildings has increased. Within Sweden, the main scheme used is the Swedish Miljöbyggnad – Sweden Green Building Council. However, international national schemes such as the as the EU Greenbuilding and BREEAM are also in demand. It was commented that it is these market driven schemes that are the driving force regarding the knowledge of content of construction products.

Finally, one respondent noted that most schemes provide support to professional users, which can be through the coding of construction products. However, it is difficult to definitively assert that enough information on a product is always provided because the conditions of use need to be taken into account. For example, flammability may be an issue when welding is conducted nearby.

Main Findings (Manufacturers and their Associations)

48 manufacturers (or their associations) provided complete responses that could be analysed. Manufacturers and their associations were asked to note which schemes they used. The voluntary schemes most cited by manufacturers were:

- BASTA;
- BREEAM; and
- EMICODE

Of those who responded, it is interesting to note that some sectors of the construction industry were more responsive than others. The highest response rate for individual manufacturers was from the plastic pipe sector. However, this higher response rate was a result of one international manufacturer providing responses from different countries. The sector most represented by associations was flooring, gypsum and plastic pipe.

Table A4:1: Response rate from individual manufacturers and their Associations			
Construction sector	Number of manufacturer responses	Number of manufacturer Association responses	Total responses
Adhesive And Sealant	1	1	2
Aggregates, Cement And Concrete		2	2
Aircrete	1		1
Building Materials		1	1
Calcium Silicate		1	1
Ceiling And Wall	1		1
Cement / Concrete	1	2	3
Chemical	2	1	3
Colours, Paints, Chemical Coatings, Materials for Façade And Insulation Technology	1		1
Flooring	1	4	5
Glass	1		1
Gypsum		3	3
Heat pump		1	1
Metal		1	1
Pipes	1		1
Plastic		2	2
Plastic pipe	5	3	8
Plastic products	1		1
Plumbing	1		1
Polymer products	1		1
Polystyrene board		1	1
Polyurethane products	1		1
Recycling		1	1
Roofing, cladding, building boards. Passive fire protection, ceramic tiles	2		2
Steel		1	1
Mineral wool		1	1
Total	**21**	**26**	**47**

Information provided by REACH and other legislation/mandatory schemes, a group of manufacturers associations noted that they were in the process of preparing a new PCR document in accordance with EN 15804. This would allow their members to communicate information about a product via an Environmental Product Declaration. They were of the view that this would provide all of the necessary information to consumers far more effectively than schemes.

Manufacturers were also asked whether the information requirements of REACH currently address the needs of clients and downstream users. Almost all respondents stated that the SDS (REACH requirement) provides the necessary information on the content of hazardous substances within construction products. It was also stressed by respondents that in their view, the presence of a particular substance does not in turn result in exposure risks or indeed, concerns for the human health or the environment.

More information required

Of the respondents who stated 'no', one commented that the information requirements contained in legislation is not sufficient to satisfy the criteria for voluntary schemes, as some need more information on the both the content of the product and the emission levels of the product. To some extent, this view was echoed by some respondents who had answered 'yes'. For example, it was noted by one such respondent that in a small number of cases, a request for VOC/SVOC content may be required or in the case of BREEAM, confirmation that the product complies with the requirements under EN13999.

Schemes must focus on the most important information

The overwhelming message received from the consultation was that schemes should only communicate to users the most important information on health and environmental hazards associated with the product. It noted that additional information alongside the SDS may distract or confuse the user and undermine the important messages conveyed within the SDS itself. This would seem to accord with the comment of another respondent who stated that even when all the information is available, the supply chain may simply not have enough time to study the composition of all construction products (there may be 2000 different products in one building) due to financial and time restraints. Another respondent was concerned that providing further information could compromise the confidentiality of the formulation used to construct the product. It would seem that there is very little demand from manufacturers for a general disclosure of the content of construction products. Indeed, rather than more extensive labelling, simplification would be better, particularly for SMEs.

Confusion regarding obligations

Many respondents also expressed concerns about the obligations regarding the communication of hazardous substances in articles/construction products. Some respondents stated that there was confusion as to what measures were mandatory and voluntary, particularly as to whether some construction products were considered articles under REACH. Related to this, another participant questioned article 6.5 of the CPR, commenting that the requirement to provide information referred to in Articles 31 and 33 (i.e. content of hazardous substances) with the DoP is unnecessary. The information is already available and it will burden manufacturers with additional costs.

One respondent concluded that there was very little demand for the generalised disclosure of the content of substances in construction products. This can be compared against another response, in which it was stated that the required information about substances used in construction products is increasing, although it does vary between Member States. For example, the Baubook in Austria requires detailed information about VOC, CMR substances and O-zone depleting substances amongst others.

National legislation

With regard to national legislation, a respondent noted that Dutch national legislation ensures that recycled aggregates (which are not applicable to REACH) are supplied safely. For example, BRL 2506 contains rules that have been designed to prevent asbestos in recycled aggregates. Environmental requirements within the Decree on Soil Quality and Soil Quality Regulation (e.g. identification of calcium hydroxide) also contribute to the safe supply of aggregates.

Information provided by REACH, legislation/mandatory schemes and voluntary schemes

Where respondents stated that the SDS did not sufficient provide information on the content of construction products, they were asked to comment on whether voluntary schemes filled this void. Interestingly, one of the respondents who had answered negatively on the previous questions answered yes.

The only additional comment noted that emission levels are often the best indicator for air quality and safety during construction, as it is not always possible to determine such results from SDS. With this in mind, the respondent welcomed the current development of European harmonised test standards for the emission of dangerous substances.

Main Findings (NGO & Others)

NGOs and other organisations were also asked to list the schemes that they were aware of and their benefits to stakeholders. Again, this helped to ensure that the coverage of schemes in the report was comprehensive. When questioned as to whether the schemes provided sufficient information on the potentially hazardous content of construction products, it was commented that no scheme contains a complete list of hazardous substances. Rather, each scheme has its own approach which results in different cut-off rules and indicator lists. A comparison was drawn with cosmetic articles, which require a complete list of contents, the NGO noting it is unfortunate that the same is not required for all construction products.

There was an interesting dichotomy between two stakeholders. The Alliance for Sustainable Building Products asserted that the Commission should take the initiative with regard to the labelling of construction products and competition between Ecolabels. More specifically, it was stated that BREEAM currently has a monopoly in the UK market and effectively prevents the entry of new Ecolabels.

Conversely, another stakeholder was of the opinion that the construction industry was a front runner for transparency in the way in which it revealed the content and hazards associated with construction products. They were of the view that the Commission should leave it to industry which through EPD and voluntary schemes provide consumers and professional users with more than adequate information on construction products.

Annex 6 CEN Mandates

In order to provide a means of comparing the scope of the schemes in terms of the type of products which they certify, the information was categorised into CEN Mandates. Table A6-1 provides detail concerning the products covered by each mandate and the common types of material used. This list is not exhaustive and where necessary the study team have used initiative to classify products within a mandate.

Table A6-1: CEN Mandates and construction products covered

Mandate Code and Mandate Title	Construction products	Materials in construction products
M100 Precast concrete products[309]	Precast normal, lightweight, autoclaved aerated concrete products; Floor beds; Roads and other trafficked areas; External walls, partitions; Floors, galleries, stairs, ramps, raised access floors, balustrades and hand rails; Frames (chimneys and shafts)	Precast concrete (possible additives: polycarboxylates, polymers, sulphonates, thiocyanates, nonyl phenol ethoxylate, fly ash etc.)
M101 Doors, windows[310]	Doors; Windows; Blinds and shutters; and Industrial, commercial, garage doors and gates	Metal (steel, galvanized steel, stainless steel, aluminium, brass etc) Wood (solid) HDF, MDF Plastics (Polystyrene, ABS, PVC, polyethylene, polyamide, polycarbonate) Polyurethane foam Powder coating, other coatings (usually acrylic-based) Rubber (EPDM, NBR) Glass Mineral wool Plasterboard Polyester composite
	Building hardware (panic and emergency exit systems, mechanically operated locks and latches)	Metal Plastic

[309] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[310] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
M102 Membranes[311]	Damp proofing sheets (floor beds)	Plastics (PVC, PET polyester) Rubber (SBS, EPDM) Bitumen Composite Preservatives (e.g. thiazolinons) Pigment (e.g. Carbon black) Fillers (e.g. Calcium carbonate, Sand)
	Damp proof courses Roof underlays Roof sheets Water vapour control layers	Plastics (PVC, Polypropylene) Rubber (SBS, EPDM, polypropylene) UV-stabilizers Preservatives (e.g. thiazolinons) Zink oxide Pigment (e.g. Carbon black) Bitumen Composite
M103 Thermal insulating products[312]	Factory made: • Mineral wool; • Expanded polystyrene (EPS); • Extruded polystyrene foam (XPS); • Polyurethane Foam (PUR); • Products of phenolic foam (PF); • Cellular glass (CG); • Wood wall; • Expanded perlite; • Expanded cork; and • Wood fibre. Clay lightweight products; Expanded perlite; Exfoliated vermiculite	Organic fibres (wood fibres) Inorganic fibres and particles (mineral wool, glass wool) Plastics (foamed e.g. polystyrene, polyurethane) Foaming agents (carbon dioxide, pentane, HFC-agents) Glass (foamed, phenol-formaldehyde resin) Flame retardants (e.g. Boric acid, Ammonium polyphosphate, HBCDD)
M104 Structural bearings[313]	Structural bearings – including chimneys and shafts	Elastomer Steel Stainless steel PTFE Carbon filled PTFE Bronze Aluminium Cast Iron

[311] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[312] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[313] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
		Brass POM
M105 Chimney[314]	Products include: • Chimneys; • Flues; and • Liners	Clay/ceramic Concrete Metal Plastics Stone Resins (phenol formaldehyde resin, furan resin, carbamide resin) Glass powder PET polyester Fillers (sand)
M106 Gypsum[315]	Gypsum products: • External walls, internal walls and partitions; • Floors, galleries and ceilings; • Sections, bars, wire, mesh; • Suspended ceilings; and • Ceiling finishes	Gypsum Metal Plasterboard Plaster Plaster-board Timber Plastics Insulating materials
M107 Geotextiles[316]	Geogrids, geonets, geosnythetics End uses: • Floor beds (suspended ground floors), roads and other trafficked areas; • Foundations and retaining walls; • Disposal of solid waste; and • Drainage (inc. highways) and disposal of other liquids and gaseous waste.	Organic fibres Plastics – metal Bitumen Inorganic fibres and particles Composites UV stabilizers Pigment (e.g. Carbon black)
M108 Curtain walling[317]	External walls (including cladding), internal walls partitions.	Stone; Precast concrete; Glass reinfor. concrete Glass reinf. Plaster Metal Timber Plastic Glass

[314] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[315] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[316] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[317] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	Components – Doors and windows/ mechanical fasteners	Metal Glass Plastics
	Sections, bars	Metal (e.g. aluminium) Timber Wood composite (e.g. plywood, MDF) Plastics (e.g. PVC, PET polyester)
	Insulation quilts/rigid sheets	Organic fibres Glass Inorganic fibres Particles Plastics (e.g. PVC, PET polyester) Metal foil (e.g aluminium) Insulating materials
	Flexible sheets	Plastics (e.g. PVC, PET polyester, polyacrylonitrile) UV stabilizers Plasticizers (e.g. phthalates) Flame retardants Bitumen
M109 Fixed fire-fighting equipment[318]	Automatic fire detection systems Ventilation for buildings Fixed fire fighting systems Fire service equipment	Metals Plastics (e.g. ABS) Glass Electronics
M110 Sanitary appliances[319]	Products examples: • Sinks; • Basins • Communal washing troughs; • Baths; • Shower units / trays; • Whirlpool baths; • Bidets; • Urinals; • Water closet bowls or pans (without or with attached flushing cistern; • Fixed earth, chemical and composting closets; • Macerating toilet; • Squatting toilet • Flushing cistern;	Precast concrete Ceramics Metals (e.g. brass, stainless steel, zinc) Plastics (e.g. ABS, ASA, PBT)/rubber (e.g. EPDM, NBR, SBR, silicone) & resins (e.g. urea formaldehyde resin)

[318] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[319] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	• Modular public toilets • Prefabricated toilet pods • Performed toilet modules; and • Shower and bath screens and enclosures.	
M111 Circulation fixtures[320]	Lighting columns and spigots Road equipment	Precast concrete Plastic fiber reinforced Concrete Metals (e.g. brass, stainless steel) Timber Plastics/rubber Glass, glass wool Aggregates, loose fills Stone Mineral wool Fibrous cement Paints
M112 Structural timber products and ancillaries[321]	Product examples: • Construction members for floor decking; • Frame elements for walls, roofs, floors, bridges; • Poles; • Trusses elements; • Piles; • Other structural elements (beams, archers, joist, rafters, columns); • Curved, straight and shaped glue laminated members; • Boxbeams; • Timber combined with non-wood based materials; • Finger jointed timber; and • Timber fasteners	Timber Glued laminated timber (e.g. MDF, plywood) Wood based panels Laminated veener lumber Orientated strand board Steel Cast iron
M113 Wood based panels[322]	Rigid sheets: • Solid wood panels; • Multilaminated wood; • Laminated veneer lumber (L.V.L.); • Plywood;	Solid wood Wood veneers Wood particles Wood fibers Impregnated paper

[320] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[321] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[322] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	• Orientated strand boards (OSB); • Particleboards (chipboards); • Fibreboards; and • Mineral bonded boards Flexible sheets	
M114 Cement[323]	Cement, building limes and other hydraulic binders	Portland cement clinker Granulated blastfurnace slag Pozzolanic material Fly ash Burnt shale Limestone Silica fume Minor additional constituents Calcium sulphate Additives (e.g. polycarboxylates, polymers, sulphonates, thiocyanates, nonyl phenol ethoxylate etc.)
M115 Reinforcing steel[324]	Concrete Concrete reinforcing and prestressing steels	Non alloyed or alloyed steel Coated steels (e.g. zinc, epoxy)
M116 Masonry[325]	Masonry • Bricks and blocks • Insulation filled and insulation faced blocks *(Include special shapes e.g. coping blocks.)*	Natural stone Aggregate concrete Autoclaved aerated concrete Manufactured stone Calcium silicate Clay

[323] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[324] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=txtSearch.search#

[325] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=258

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	Lintels • Single • Composite • Combined	Natural stone Manufactured stone Aggregate concrete Autoclaved aerated concrete Clay Calcium silicate
	Sections, bars, wire, mesh: Bed joint reinforcement • Wall ties • Shear ties and slip ties • Tension straps • Joist hangers • Brackets and support angles.	Plastic
M118 Waste water disposal[326]	Components for waste water engineering products inside buildings: • Back-flow devices: air admittance valve ventilating pipework • Kits for waste water pumping station and effluent lifting plants • Components for waste water engineering products outside buildings: • Kits and elements for waste water treatment plants and on-site treatment equipment • Septic tanks • Prefabricated drainage channel • Manholes and inspection chambers • Covers, step irons, ladders and handrail for manholes and inspection chambers, gully tops • Separators	Precast and fibre concrete Metal Glass Plastics Vitrified clay Synthetic resin Composite materials Rubber
M119 Floorings[327]	Paving units • Pavers • Lags • Kerbstones • Blocks • Pavement lights	Stone Concrete (cast stone) Clay glass
	Prefabricated components: • Raised access floors • Cavity floors	Stone Ceramic Clay Concrete Metal

[326] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=256

[327] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=255

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
		Timber Plastic Rubber Glass
	Mesh: • Expanded metal or grid • Floor decking	Metal
	Rigid sheets: • Self-finished decking • Metal sheet • Timber planks • Ply or composite board • Floor gratings	Metal Wood Organic fibres
	Rigid tiles: • Rigid floor tiles or paving • Lags • Slate • Ceramic tiles • Mosaic • Quarry tiles • Terrazzo • Parquet • Laminate floorings	Stone Concrete Clay Wood Asphalt concrete Natural asphalt Cork Plastic resins
	Flexible sheets/tiles: • Textile floor coverings including tiles • Flexible laminate floorings • Plastic and rubber sheets • Linoleum and cork • Floor loose laid tiles • Anti-static Flooring	Organic and inorganic fibres and particles Cork Rubber Plastics including linoleum
M120 Structural metallic products [328]	Structural metallic sections/profiles (including plates, sections, bars, tubes and strip): • Hot rolled • Cold formed or otherwise produced sections/profiles with various shapes (T, L, H, U, Z, I, channels, angle, hollow, tubes) • Flat products (plate, sheet, strip) • Bars • Castings • Forgings made of various metallic materials	Steel Aluminium alloys Coated steel Stainless steel Steel alloys Cast steel Cast iron
	Structural metallic construction members (including kits, elements and sections): • Finished metallic products such as metal framing for suspended ceilings (heavy duty)	Steel Aluminium alloys Coated steel Stainless steel

[328] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=254

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	• Trusses • Girders • Columns • Stairs • Ground piles • Bearing piles and sheet piling • Rails and sleepers	Steel alloys Cast steel Cast iron
	Welding material (including wires and bars)	Aluminium alloys Steel alloys Stainless steel Steel
	Structural connectors: • Metallic rivets • Bolts (nuts and washers) and H. R. bolts (high strength friction grip bolts • Studs • Screws • Railway fasteners	Aluminium alloys Coated steel Steel Stainless steel
M121 Wall and ceiling finishes[329]	Flexible sheets/rolls: • Wall coverings in roll form • Ceiling linings	Organic and inorganic fibres Paper Rubber Plastics Composites Cork
	Rigid sheets (small and medium size): • Cladding slabs (with or without integrated fixation) • Shingles (overlapping tiling) • Wall tiles (butted tiling) • Ceiling tiles	Natural stone Concrete Clay Ceramic Metal Timber Plastics Wool Organic and inorganic fibres Fibre reinforced calcium silicate Fibre cement Slates
	Rigid sheets (large size): • Wall panels, including large metallic cladding • High/low pressure laminates and sandwich panels with or without insulation • Ceiling panels, including sandwich panels with or without insulation	Metal Reinforced concrete Fibre cement Timber Plastics Cork Inorganic boards Composites
	Profiles:	Timber

[329] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=253#

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	• Sidings	Metal Plastics (e.g. polyethylene, PVC) Composites Fibre cement Wood based materials
	Components and sections: Featured profiles Suspending frames (*for suspended ceilings)*	Metals* Timber* Plastics
	Suspended ceilings kits (including ceiling tiles or ceiling panels and suspended frames)	(as above)
	*Products made of these materials are not covered by this mandate since they are in the mandate for structural metallic sections and for structural timber products.	
M122 Roof coverings[330]	Large rigid sheets: • Flat and profiled sheets (opaque and transparent / translucent, including rigid underlays) • Factory-bonded composite or sandwich panels (with / without insulation) • Fascias and soffit boards • Accessories (e.g. ridges, valleys, flashings)	Plastics (Plastics (PVC, Polypropylene) Rubber (SBS, EPDM, polypropylene) UV-stabilizers Preservatives (e.g. thiazolinons) Zink oxide Pigment (e.g. Carbon black) Metal Wood Concrete Fibre cement Glass* Bituminous composites Organic and inorganic fibres
	Medium and small rigid sheets, rigid tiles: • Roofing tiles, slates, stones, shingles and sheets • Special tiles (eg ridge tiles, ventilation tiles, valley tiles) • Roof pavings (as the external covering or ballast) • Insulating panels (for inverted roofs)*	Stone (natural and manufactured) Slate Concrete Fibre cement Clay Metal Glass Wood Plastic Bitumen/composites
	Sheet metal: • Thermoplastic, elastomeric and sealing sheets, jointing tapes, flashings * • Bitumen bonded felts - built up roofing * • Flexible underlays, membranes *	Plastics (e.g. PET polyester) Bitumen/composites (containing SBS) Metal Volatile organic solvents
	Components: • Roof and eaves ventilators (not incl machinery)**	Metal (e.g. aluzinc-coated steel, galvanized steel, powder coated galvanized steel, copper)

[330] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=252

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	• Drainage systems, roof outlets, eaves gutters etc** • Rooflights***(individual and continuous, incl. eg skylights, roof domes and ancillary products (eg upstands) • Roof windows • Access systems, walkways and footholds • Safety hooks and anchorages • Mechanical fixings for roofing coverings	Wood Plastics Rubber (e.g. EPDM, NBR and SBR) Glass Concrete Clay
	Products include: • Mastic asphalt roofing • Thatch** • Chippings, pebbles, gravel** • Sprayed external insulation systems*	Organic and inorganic fibres/coatings (e.g. mineral wool) Bituminous composites (containing SBS) Plastics (PET polyester) Concrete Stone
	** Included in other mandates and not considered here ** No characteristics relevant to essential requirements ***Not including self-supporting translucent roof kits/ systems (mandate to EOTA)	
M124 Road construction products[331]	Bitumen/Bituminous mixtures	Bitumen Polymers Admixtures Aggregates
	Naturally occurring asphalt/bitumen	Asphalt Aggregates
	Surface treatments: slurry for surfacing, microsurfacing, surface dressing	Bitumen Polymers Admixtures Aggregates
	Ancillary products: • Dowels • Joint fillers, joint sealants	Steel
	Flexible sheets: • Bridge deck waterproofing products and kits (e.g. mastic asphalt, prefabricated membranes, preformed bituminous sheets,resins/polyurethane)	Bitumen Asphalt Resins Polymers Aggregates Metal Polyurethane Textiles
M125 Aggregates[332]	Aggregates for the preparation of	Stone Sand

[331] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=250#

[332] European Commission website: Standardisation – Mandates, accessed:

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	• Concrete, mortar and grout • Bituminous mixtures and surface treatments • Unbound and hydraulically bound mixtures Armourstones Railway ballast • Fillers for the preparation of concrete, mortar and grout • Bituminous mixtures and surface treatments	Gravel Lava and tuff Ashes Clays Slags Vermiculite Perlite Incinerator residues Concrete Masonry Asphalt
	*Material from these groups can be used for aggregates and fillers on its own or in combination	
M127 Adhesives[333][334]	Structural adhesives (e.g. epoxy resins, polyurethane resins, acrylic resins, aminoplastic resins, phenolic resins)	Organic Inorganic
	Adhesives for tiles (e.g. hydraulic binders, cementitious binders, dispersion polymers, reaction resins)	Organic Inorganic
M128 Concrete, mortar and grout [335]	Additions (incl' Pigments)	Ground stone Silica fume Fly ash Slag Natural and industrial pozzolana Chemicals/powders
	Admixtures	Chemicals
	Fibres for concrete, mortar and grout	Plastic Glass Steel Carbon Cellulose
	Concrete protection and repair products: • Surface protection products • Structural and non-structural repair products • Structural bonding products • Concrete injection products	Chemicals Cements Aggregates Admixtures Additions Resins

http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=249

333 Construction adhesives used for e.g. for floorings and wallpapers and other finishes, except ceramic tiles and slabs made of natural stone and similar, are not covered by this mandate. Adhesives used as part of prefabrication of construction elements, e.g. glued laminated timber structures, are not covered by this mandate. Some structural bonding products are already covered by the mandate for Concrete products, like repair products etc. Adhesives for thermoplastic piping systems are covered by the two mandates for Pipes, tanks and ancillaries (both in contact with water intended for human consumption and not in contact).

334 European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=247#

335 http://www.ue.itb.pl/files/ue/M128%20EN.pdf

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	• Rebar anchoring products* • Reinforcement corrosion prevention products	Polymers
	* Not including products used for anchoring purposes, which are covered by a mandate to EOTA	
M129 Space heating appliances[336]	Space heating appliances without internal energy source** (e.g. radiators, convectors, fan convectors including fan coil units, skirting heaters, ceiling mounted panels and other static heat emitters, wall and floor heating kits)	Metals (e.g. steel, aluminium, copper, cast-iron) Plastics (e.g. ABS, PC/ABS
	Space heating appliances burning solid and liquid fuels*** (e.g. flued oil stoves, residential cookers, roomheaters, fireplace stoves, heating inserts, sauna stoves)	Metals Glass Natural stone Ceramic Thermal insulation Mortar Bricks Vermiculite Refractories Plastics and wood*
	*Materials that could be used for operating components **Electrical space heating appliances are covered by the directive (73/23/EEC), and therefore not included in this mandate *** Appliances burning gaseous fuels are covered by the directive 90/396/EEC, and therefore not included in this mandate. Efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels are covered by the directive 92/42/EEC, and therefore these requirements are not included in this mandate. Appliances specifically designed for use in industrial processes carried out on industrial premises are excluded from this mandate. Electrically operated appliances are excluded from this mandate.	
M131 Pipes, tanks NOT in contact with drinking water[337]	Kits: composed of pipes, fittings, adhesives and joints, including their supports, to be used for transport and/or distribution and/or disposal of: • Water not intended for human consumption. • Fuel/gas for use inside buildings and independent system of building supply.	Cementitious materials Metallic materials Organic materials Glassy materials Composite
	Pipes: rigid, flexible and malleable components	Cementitious materials Metallic materials Organic materials Glassy materials Composite
	Tanks and systems: (including free standing tanks) used in fixed installation for supply or storage.	Cementitious materials Metallic materials

[336] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=245#

[337] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=243#

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	Except those tanks included in Industrial Processes and in other Mandates such as Waste Water Engineering, Sanitary Appliances, CP in contact with Drinking Water, etc.	Organic materials Glassy materials Composite
	Products include: • Fittings (including waste fittings for sanitary appliances) • Adhesives • Joint sealings and gaskets	Metals (e.g. brass) Rubber (e.g. NBR, SBR, EPDM) Plastics (e.g. PVC, polypropylene, polyethylene, POM) Chemical compounds
	Ducts and conduits	As indicated above for pipes
	Pipe and duct supports	Plastics (e.g. polypropylene, polyethylene, PVC) Metals (e.g. copper, stainless steel, cast iron) Precast concrete
	Valves and taps: • Regulator safety devices • All valve families (eg Gate, Stop, Isolated, Float, Process)	Metals Rubber Plastics Composite Cast iron
	Safety ancillaries for gas piping kits/systems: • Electric insulation unit • Safety devises • Pressure controller • Filters	Steel Aluminium alloys Plastics
M135 Glass[338]	Products include: • Flat glass panels (incl. glass for structural sealant glazing systems) : • Basic glass (e.g. soda-lime-silicate glass, borosilicate glass, glass • ceramics); • Processed glass (e.g. strengthened glass, laminated glass); • Special or safety glasses (e.g. toughened safety glass, laminated safety glass, anti-bullet glass, anti-explosion glass, anti-bandit and antivandalism glass, glass for use in fire resisting glazed assemblies, glass incorporating electric heating and/or alarm systems); • Coated, filmed, enamelled, surface treated or mirrored glass.	Glass (can incorporate: organic materials, metal, silicate materials, silicone materials)
	Glass block wall panels	Glass (can incorporate: metal)

[338] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=239

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	Products include: • Curved glass panels (incl. glass for structural sealant glazing systems; types as for flat glass panels); • Channel-shaped glass (wired or unwired)	Glass (as rigid sheets)
	Products include: • Insulating glass units (plane or curved; incl. glass for structural sealant glazing systems; glass types as for flat glass panels; can incorporate electric heating of • the glass and/or alarm systems); • Ancillary products for glass block wall panels**	Glass (as rigid sheets)
	Glass blocks and pavers *	Glass (can incorporate: metal)
	Tiles *	Glass
	Pipes *	Glass
	*Included in other mandates and not considered here **No characteristics relevant to essential requirements	
M/443 Power, control and communication cables[339]	Power, control and communication cables*	Metals Plastics Rubber Composites Glass
	*This mandate does not cover control and power circuits inside machinery (Council Directive 89/392/EEC) or lifts (European Parliament and Council Directive 95/16/EC), or other cables specifically designed for use in industrial processes carried out on industrial premises	
M/474 Sealants for non-structural use in joints in buildings and pedestrian walkways[340]	Sealants for • External and/or internal walls, partitions • Glazing • Sanitary joints • Pedestrian walkways	Paste (acrylic based polymers, MS-polymer, PUR-polymer, alkyd-polymers, preservatives (e.g. isothiazolinones, cobolt-2-ethyl hexanoate), phthalates, organic tin catalyzers, skin-preventing additives (e.g. Methyl ethyl ketoxime, 2-Butanoxime, Cobolt compounds such as hexanoic acid, 2-ethyl-, cobolt salt och cobolt carboxylate) Strips
M/489 External thermal insulation composite systems	Rigid sheets: • External thermal insulation composite systems/kits with Rendering*, in which the following elements may be integrated: Thermal insulation boards	Mineral wool Expanded polystyrene
	Flexible sheets:	Glass fibres

[339] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=423#

[340] European Commission website: Standardisation – Mandates, accessed: http://ec.europa.eu/enterprise/standards_policy/mandates/database/index.cfm?fuseaction=search.detail&id=460

Table A6-1: CEN Mandates and construction products covered		
Mandate Code and Mandate Title	**Construction products**	**Materials in construction products**
	• Reinforcing meshes	Steel mesh
	Components: • Profiles • Anchor • Pins • Fittings • Strips • Joint covers	Metal Plastics Rubber
	Products include: • Renders • Adhesives • Paints • Mastics	Binders Admixtures Additions Aggregates Adhesives Pigments Polymers
	*This mandate does not intend to establish conditions for the components but only for the kits as construction products	
Other Construction Products	Construction products, or groups of construction products that do not neatly fall within any of the CEN Mandates	
Non – construction products		

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