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# Environmental Information for Products and Services

Requirements – Tools – Examples

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# Environmental Information

for Products and Services



*Requirements – Tools – Examples*

# Contents

|            |  |           |
|------------|--|-----------|
| <b>I</b>   | <b>Introduction</b>  | <b>6</b>  |
| <b>II</b>  | <b>Product-related environmental information</b>               |           |
|            | <i>Overview</i>  | <b>11</b> |
| 2.1        | Finding the correct format: International standards            | 13        |
| 2.2        | Clear communication requirements: Framework standard ISO 14020 | 16        |
| 2.3        | Competition law  | 18        |
| 2.4        | Other product labels   | 20        |
| <b>III</b> | <b>Product ratings</b>   |           |
|            | <i>Type I ecolabels</i>  | <b>22</b> |
| 3.1        | Product rating based on a criteria matrix                      | 23        |
| 3.2        | The Blue Angel   | 24        |
| 3.3        | The European Ecolabel  | 28        |
| <b>IV</b>  | <b>Making accurate environmental claims</b>                    |           |
|            | <i>Type II ecolabels and EPDs</i>                              | <b>30</b> |
| 4.1        | Be mindful of market impacts                                   | 31        |
| 4.2        | Frequently used terms  | 33        |

|             |   |           |
|-------------|---|-----------|
| <b>V</b>    | <b>Complex information for the global market</b>                                      | <b>36</b> |
|             | <i>Type III Environmental Product Declarations (EDPs)</i>                             |           |
| 5.1         | Quantitative and objective  | 37        |
| 5.2         | Experience to date: Focus on construction products                                    | 40        |
| 5.3         | Examples from the construction sector   | 42        |
| <b>VI</b>   | <b>Other voluntary ecolabels</b>  | <b>51</b> |
| 6.1         | FSC® AND PEFC™  | 52        |
| 6.2         | Textile labels: Flow of information that transcends global production chains          | 53        |
| 6.3         | Bio-Siegel label for organically farmed foodstuffs                                    | 56        |
| 6.4         | Marine Stewardship Council  | 57        |
| 6.5         | THE ECO DECLARATION and EPEAT: Certification processes for IT products                | 57        |
| 6.6         | Aiming for energy efficiency  | 61        |
| 6.7         | Sustainability seal for soaps, detergents and maintenance products                    | 62        |
| 6.8         | Concrete Sustainability Council   | 63        |
| <b>VII</b>  | <b>Life cycle assessment and other evaluation methods</b>                             | <b>65</b> |
| 7.1         | Life cycle assessment: A differentiated view of products                              | 66        |
| 7.2         | Product carbon footprint as an indicator of product-related climate action strategies | 70        |
| 7.3         | Water footprint: An indicator of water protection worldwide                           | 75        |
| 7.4         | Product environmental footprint: The European approach                                | 78        |
| <b>VIII</b> | <b>The ISO 14000 family of standards</b>  | <b>81</b> |
|             | List of abbreviations   | 84        |
|             | List of illustrations   | 86        |
|             | List of tables  | 86        |
|             | Picture credits   | 86        |



# I

## Introduction

- *When can a product be described as recyclable or water-saving?*
- *How can a product's environmental benefits be used in marketing?*
- *What types of environmental labelling are available for products and services?*

Among the general public, there is a growing awareness of the environmental impacts of products and escalating demands on companies to take environmental action through their products. As a result, product-related environmental information is becoming ever more important.

**The aims of this brochure are to:**

- provide an objective overview of the opportunities and tools for product-related environmental information, with a particular focus on the voluntary approaches available to companies alongside the mandatory information required by law.
- outline reporting tools available for collating environment-related data over a product's lifecycle.
- define the fundamental requirements associated with standardisation and the statutory regulations on product-related environmental information.
- help companies select a suitable tool for their particular application, and
- guide consumers through the various different levels.

**The environmental debate is changing at both national and European level.** While in the 1990s, attention focused on internal production processes, interest has gradually shifted to the disposal and handling of individual materials. Today, the products themselves are increasingly under the spotlight at every stage of the product life cycle, from the extraction of raw materials, through production and use, to disposal or recycling. At European level, this trend is reflected in materials and chemicals policy, directives on product responsibility for waste management (of electrical and electronic equipment, vehicles, packaging and batteries), energy consumption labelling, the Ecodesign Directive as part of integrated product policy, and numerous other measures associated with the European closed substance cycle strategy. They all serve a common goal: to limit the harmful environmental impacts of products at every stage of their life cycle.

With this in mind, environmental information on every aspect of a product is increasingly important for companies, consumers and governments alike. Companies are already subject to a range of statutory regulations on product-related environmental information, and there are numerous standards in place at national, European and international level. Companies may voluntarily apply these standards to satisfy the environmental demands of the general public and provide a transparent account of their product-related environmental achievements.

**Against this background, product-specific environmental information is becoming ever more vital on the journey towards sustainability.**



**Ecolabels help to identify “front runners” in the mix of environmental policy tools and thus boost demand for more environmentally friendly products.**

For companies, environmental information about their products plays a key role in improving their relationships with customers, suppliers and other stakeholders. Positive product labelling and high-quality information allow companies to document their environmental responsibilities, which in turn contributes to both environmental quality and product quality.

*The supply and use of **product-related environmental information** can boost companies' market success and enable them to respond promptly to environmental policy developments.*

**Companies may benefit from product-related environmental information in many different areas:**

- As a response to consumer enquiries
- To meet the information needs of key accounts, for example in response to queries about waste, energy consumption, ingredients such as solvents, or a product's contribution to climate change
- In communications with trading companies seeking information about a product's environmental aspects
- As a solid basis for marketing activities
- In public-sector sales to federal, regional and local governments which may refer to eco-friendly products
- To help ensure a smooth flow of information within the supply chain; suppliers are legally required to provide ever more detailed information on the environmental aspects of products, components and materials
- To satisfy the information needs of government offices
- To more effectively meet the information requirements of NGOs

Additionally, product-related environmental information may positively influence relations with investors and lenders.

*Clear guidelines on the formulation of **environmental information** help to facilitate day to-day product development, procurement, marketing and sales.*

**Product-related environmental information is a key aspect of developing more environmentally friendly products.**

Overall, clear information in the supplier chain can help to:

- Enhance a product's material and energy efficiency
- Avoid hazardous substances in products
- Avoid hazardous consumables and auxiliary materials
- Develop eco-friendly manufacturing processes





*Environmental information is a key aspect of eco-friendly product development.*

- Extend a product's useful life, and
- Implement other eco-friendly product development concepts.

Alongside these voluntary measures, companies must also observe the statutory regulations. Many products are covered by the regulations implementing the EU Ecodesign Directive, which defines clear legal requirements for product design and the required product information. Furthermore, the regulations implementing the EU Energy Labelling Regulation (formerly Directive 2010/30/EU) define the mandatory information requirements for selected energy-related products. Chemicals legislation requires certain chemical products to be labelled with hazard symbols and to disclose information about selected constituent substances of very high concern (SVHC).

There are a range of tools available for recording and assessing environmental impacts. These include the international standards in the ISO (International Standardisation Organisation) 14000 family, particularly the product-specific standards on the preparation of ecolabels and life cycle assessments and on the eco-friendly design of products, and the DIN (Deutsches Institut für Normung, German Standards Organization) Technical Report on Integrating Environmental Aspects into Product Design and Development. These standards also contain guidance on identifying and improving the environmental impacts of organisations (cf. the overview of standards on the following page).

## Sustainability is the goal!

This brochure focuses primarily on environmental aspects, as an element of companies' responsibility for sustainable development. The German Government is committed to the global aim of sustainable development and supported by a broad social consensus. This is also reflected in the national sustainability strategy incorporating the elements of sustainable production and sustainable consumption.

Sustainability means meeting environmental challenges with due regard for economic and social aspects. By incorporating all three requirements, companies can contribute to the goal of sustainable production. However, governments and consumers have a responsibility too. Governments must create the framework conditions enabling companies to produce sustainably, and individuals to consume sustainably. This brochure highlights the environmental aspects of products and services; it is also worth mentioning that, in recent years, there has been a growing emphasis on social aspects as well, for example, in the criteria for ecolabels.

**If we are to meet our environmental goals, an integrated approach is needed.** The interactions between information, marketing, eco-friendly product development and production on the one hand, and responsible consumption on the other, will help us move closer to our goal of sustainability.

**Table 1:** The ISO 14000 family of standards (excerpt)

| Organisation-related  | Product-related  |
|---|--|
| <p><b>ISO 14001 series</b><br/>Helps organisations to develop and optimise an environmental management system</p>                                       | <p><b>ISO 14020 series</b><br/>Provides guidance on environmental labelling and environmental product declarations</p>                               |
| <p><b>ISO 14030 series</b><br/>Provides guidance on the selection and use of indicators for evaluating an organisation's environmental achievements</p> | <p><b>ISO 14040 series</b><br/>Provides guidance on the preparation of life cycle assessments, ecoefficiency assessments and the water footprint</p> |
| <p><b>Standard ISO 14063</b><br/>Provides guidance on environmental communications</p>  | <p><b>DIN Technical Report ISO/TR 14062</b><br/>Outlines concepts for incorporating environmental aspects into product development</p>               |
|   | <p><b>Standard ISO 14067</b><br/>Provides guidance on preparing a carbon footprint</p>   |

*On the one hand, the ISO 14000 family of standards provides organisation-related guidance on developing environmental management systems and evaluating an organisation's environmental performance; on the other, it also explains ways of voluntarily providing environment-related product information while meeting the customer's information needs.*



## II

# Product-related environmental information: Overview

- *The value and effectiveness of environmental claims depends on the extent to which the information content is reliable and meaningful.*

ISO 14020 sets out global standards for product-related environmental information. Alongside it, various laws and regulations create the framework for communications, such as the Unfair Competition Act in Germany. Individual standards provide the framework for different “types” of labelling and environmental product declarations, while other

standards define the procedures for compiling life cycle assessment-related information. As well as the information tools based on international standards, there are also numerous other voluntary and mandatory product-related labels.

This brochure focuses primarily on voluntary ecolabels and life cycle assessment-related tools for compiling product-related environmental data:

**Chapter 3***Type I ecolabels***Chapter 4***Type II ecolabels and environmental declarations***Chapter 5***Type III environmental product declarations***Chapter 6***Other voluntary ecolabels***Chapter 7***Life cycle assessment and related tools*

Section 2.4 of this chapter outlines some other common product labels, some of which contain environmentally relevant information, for the purposes of delineation.

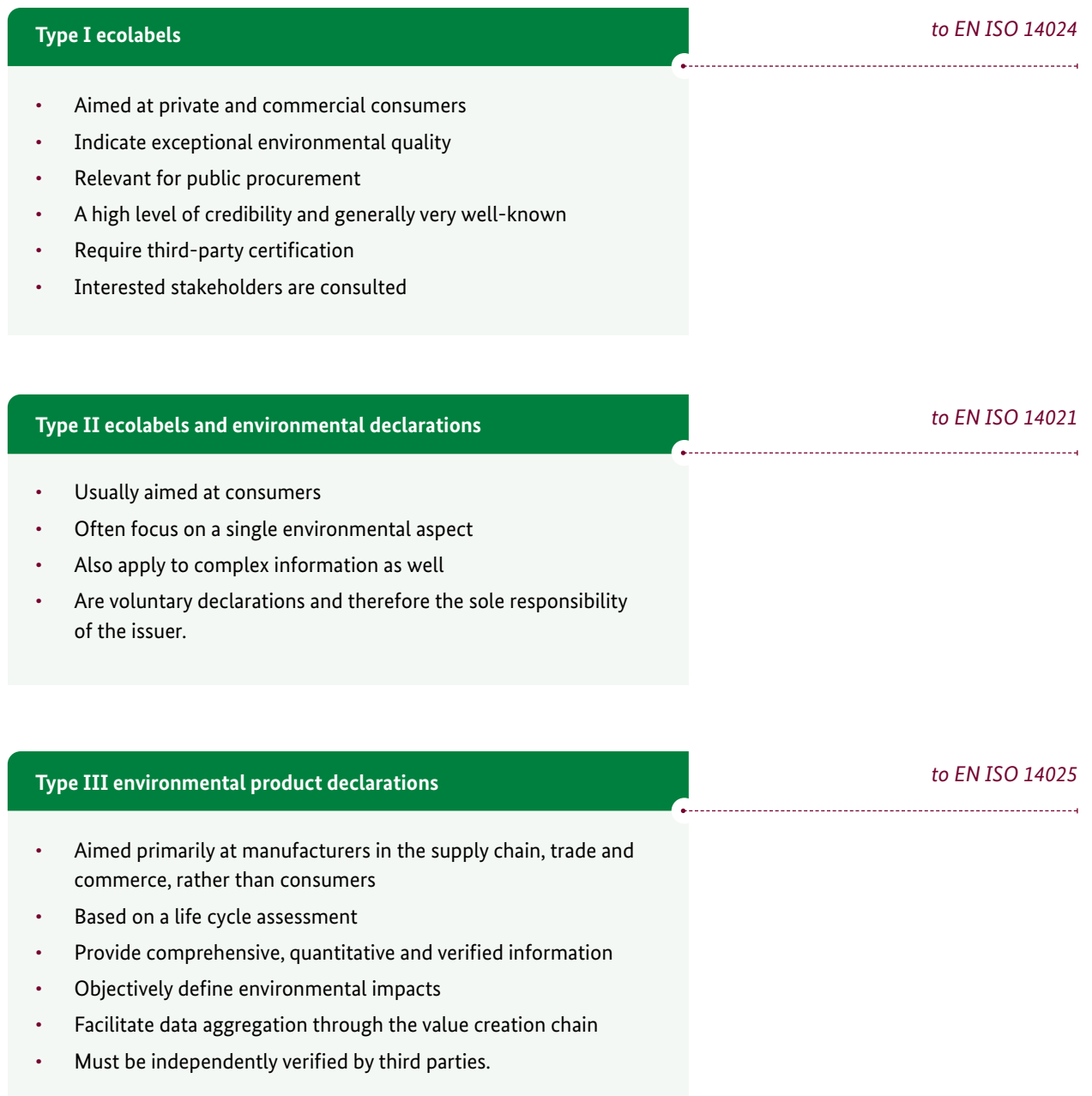
Companies decide which voluntary tools are suitable for their particular purposes. Their choice will depend on the specific application and the company's own needs, but the tools are generally suitable for all products and services\*.

*\*The practical examples presented in this brochure are offered as inspiration. The publishers cannot accept any responsibility for their content.*

## 2.1. Finding the correct format: International standards

The ISO 14000 family of standards, particularly ISO 14020, provides centralised regulations for the development and use of environmental information relating to products and services. It also includes interfaces to environmental management standards for products, including the ISO 14040 series.

**Diagram 1:** Standard-based ecolabels and environmental declarations



**Diagram 2: Product-related environmental management standards**

to EN ISO 14006

#### Guidelines for incorporating ecodesign

- Aimed at companies and organisations
- Provide guidelines to assist companies and organisations in establishing, documenting, implementing, maintaining and continually improving their product ecodesign.

to EN ISO 14040 and  
EN ISO 14044

#### Life cycle assessment

- Aimed at experts in business, academia and politics, as well as selected segments of the general public
- Comprehensively describe the environmental impacts of a product or service
- Consider the entire lifecycle
- Are the responsibility of the client, the practitioner and the reviewer
- In the case of comparative life cycle assessments, must be reviewed by an independent third party (reviewer)

to EN ISO 14045

#### Eco-efficiency assessments

- Aimed at experts in business, academia and politics
- Facilitate the practical application of an eco-efficiency assessment
- Consider the entire lifecycle of a product
- Require transparent, precise, informative reporting
- In the case of comparative eco-efficiency assessments, must be reviewed by an independent third party (reviewer)



### Water footprint

to EN ISO 14046

- Aimed at experts in business, academia and politics, as well as selected segments of general public
- Based on the fundamental principles of the life cycle assessment
- May also be ascertained as part of a life cycle assessment
- Includes a comprehensive assessment of the environmental impacts of water use and water consumption
- May relate to products, services, processes or organisations

### Carbon footprint of products

to EN ISO 14067

- Aimed at experts in business, academia and politics as well as selected segments of the general public
- Based on the fundamental principles of the life cycle assessment
- Focuses solely on the environmental aspect of greenhouse gas emissions
- May relate to products or services.

## 2.2 Clear communication requirements: Framework standard EN ISO 14020

Product-related environmental claims are used extensively in marketing and public relations work as well as in communication between companies. Banal, dubious and incomprehensible claims must be avoided.

The EN ISO 14020 standard was developed to create more certainty for companies and end clients. Its clear guidelines for product-related environmental information are also designed to promote the supply of and demand for products that are less harmful to the environment. The standard provides a framework for other, more specific standards in the ISO 14020 family by formulating general principles.

### Nine principles

#### Correct information

**Principle 1:** Statements concerning the environmental aspects of a product must be accurate, verifiable, relevant and not misleading.

#### No obstacles to trade

**Principle 2:** Requirements relating to the award of environmental claims and ecolabels must not create unnecessary obstacles to international trade.

#### Verifiable methods

**Principle 3:** Statements on the environmental aspects of a product must be based on widely accepted, accessible, scientifically verifiable methods.

#### Information for interested parties

**Principle 4:** Information about the processes, methods, criteria and basic assumptions on which the ecolabels are based must be accessible to all interested parties.

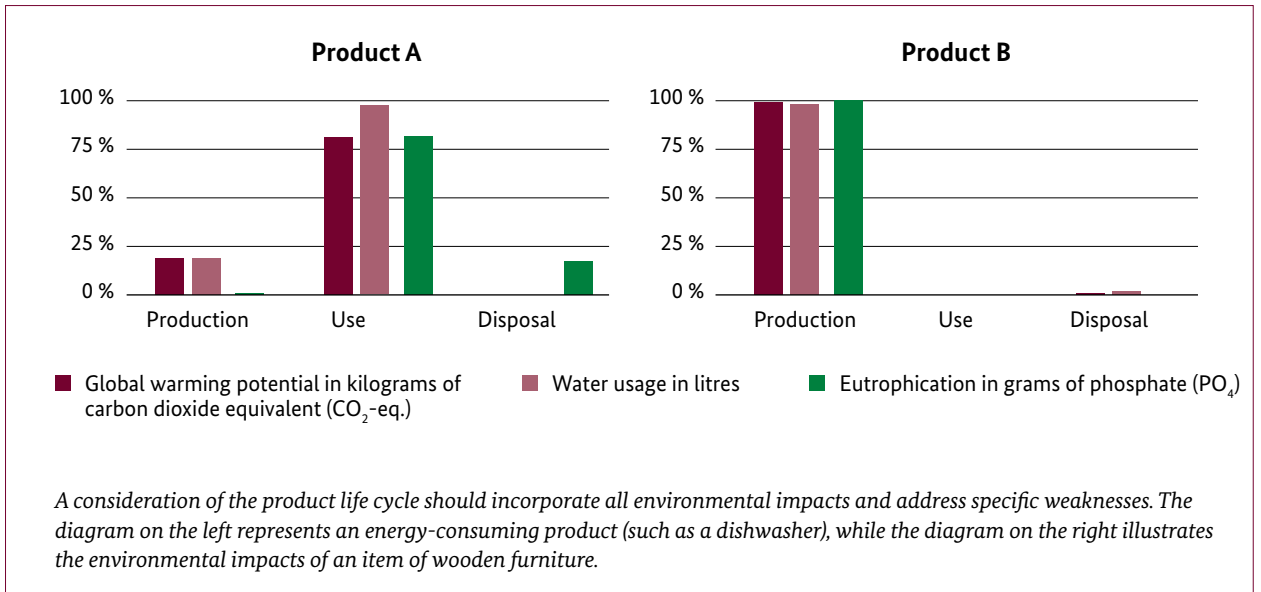
#### Consider the product life cycle

**Principle 5:** When preparing environmental statements and ecolabels, all stages in the product life cycle should be taken into consideration. A life cycle assessment is helpful, but not essential.





**Figure 1:** The product life cycle



**Do not inhibit innovation**

**Principle 6:** Ecolabels must not inhibit innovation which maintains or has the potential to improve environmental performance.

**Be moderate**

**Principle 7:** The administrative input and information requests involved in preparing product-related environmental claims should be kept to a bare minimum.

**Open consultations**

**Principle 8:** The procedure for developing ecolabels should include open consultation with interested parties (with the exception of ISO type II labels, see chapter 4)

**Information for purchasers**

**Principle 9:** Information that is relevant to product-related environmental claims must be accessible to the (potential) purchaser of a product.

An open procedure strengthens market acceptance of an ecolabel and enhances the credibility of claims.

Purchasers must be able to understand environmental claims and their background.

Possible tools include advertising brochures, information boards in stores, websites or a telephone service for consumers.

## 2.3 Competition law

Alongside the EN ISO 14020 standard, there are various other laws and regulations that define the framework for communications. In Germany, the Act Against Unfair Competition (UWG) regulates the basic principles of advertising. It stipulates that advertising must not contain any misleading information and must not offend against public decency. It should contain accurate information offering guidance to consumers. Standard EN ISO 14021 also assists with the correct formulation of product-related claims and environmental declarations (see Chapter 4).

A legal assessment of environmental advertising tends to focus on potentially misleading statements.

### Conformity between ISO 14020 and the UWG

The UWG states that terms such as “environmentally friendly”, “natural” or “degradable” are vague and evoke contradictory expectations and emotions. The law requires clear references and specific information on why, within which framework and to what extent a product or service has the capacity to the environment. A term like “environmentally friendly” does not in itself meet these requirements. In this regard, the UWG and standard EN ISO 14020 are based on the same concept.

### Strict yardsticks in the UWG

Until now, misleading advertising relating to environmental protection aspects in Germany has been judged according to strict yardsticks, similar to those governing health-related advertising. This is because growing environmental awareness has focused more attention on environmental advertising, which is designed to have an emotional appeal. Using vague terminology increases the risk of misleading people.

### Jurisdiction is changing

In the past, blanket environmental statements were often assumed to be misleading. However, German jurisdiction is now based on the assumption that consumers are responsible, critical and attentive, rather than superficial.

More recent jurisdiction has ruled that information is not misleading if it refers to widely known and therefore self-evident facts.

### Court rulings: Green electricity and nuclear-free energy

A ruling by the Hamburg Regional Court found that consumers of average intelligence would not interpret 'clean' or 'green' electricity literally, and such terms are therefore not considered potentially misleading. By contrast, an advertising statement “Customers of this utility company are assured of 100 percent nuclear-free electricity” is objectively inaccurate, according to a ruling by the Frankfurt Higher Court, and

constitutes misleading advertising because customers who opt for 'green electricity' tariffs are supplied from the same grid and the same electricity mix as other customers. Despite the modified consumer model, a considerable proportion of consumers could misinterpret this statement due to a lack of technical knowledge about electricity supply and could be led to believe that they are being supplied directly and exclusively with nuclear-free electricity (Hamburg Regional Court, case number: 315 O 773/99, 406 O 198/99 and Frankfurt Higher Regional Court, case number: 11 U 45/08).

### **Ruling: Recyclability**

The Regional Court of Wiesbaden ruled that advertising beverage cartons as "100% recyclable" is misleading, as the latest technology is only capable of recycling a far lower proportion of constituent materials. (Wiesbaden Regional Court, case number: 12 O 58/11).

### **Lawsuit: Yoghurt pots made from renewable raw materials**

Packaging made from the maize-based bioplastic polylactide (PLA) may not be advertised as 'environmentally friendly' or 'more environmentally friendly' if it is no more environmentally friendly than conventional plastic packaging when considered from a holistic perspective. A study commissioned by the defendant company concluded that it offered some ecological benefits in selected impact categories, but not over the entire life cycle. As part of a settlement (2011), the company undertook to refrain from such advertising claims in future and to remove existing packaging bearing the slogan from its range within six weeks.



## 2.4 Other product labels

Ecolabels are usually voluntary measures designed to highlight and promote the positive environmental characteristics of a product or service. As so-called “soft” instruments, ecolabels do not have a mandatory or prohibitive character. Their success and impact depend on the seller’s motivation and their credibility among consumers. As well as the tools already mentioned, some product labels are prescribed by law and may include environmental aspects; these exist alongside industry-specific quality labels. Here are some examples:



### Mandatory labels prescribed by law

#### CE marking

Products which are covered by one or more European Union (EU) directives or EU regulations must display the European Conformity (CE) mark before entering circulation or commencing operation in the EU and EFTA (European Free Trade Association) excluding Switzerland. This covers numerous product groups, such as electrical appliances or toys, and the CE marking may only be affixed to those products for which it is a legal requirement. The CE marking confirms full compliance with the specific legal requirements applicable to a product under harmonised European law. For example, this includes minimum energy efficiency requirements for products covered by the Ecodesign Directive, which may also include the supply of environmental information. The CE marking also confirms that a conformity assessment has been carried out in line with the applicable rules.



#### Energy consumption labelling

Household appliances such as refrigerators, washing machines and televisions must display the energy efficiency class, energy consumption and other specific information when sold in the European Union. Corresponding product labels and data sheets are prescribed by the relevant EU Regulations, to inform purchasers about the energy efficiency and other parameters of the appliances..



#### Labelling under the CLP Regulation

The EU has adopted a separate regulation implementing the Globally Harmonized System of Classification, Labelling and Packaging of Chemicals (GHS). The so-called CLP Regulation (Regulation EC No 1272/2008 on Classification, Labelling and Packaging) defines harmonised EU-wide rules on the classification and labelling of chemical products, substances and mixtures.

The standardised global system for the classification of substances and the labelling of products with hazard pictograms and texts is designed to ensure that hazards (physico-chemical, human health-related and environmental) associated with the manufacture, transport and use of chemicals are communicated effectively and therefore minimised. After a transitional period, the CLP Regulation replaced the former Dangerous Substances Directive and Preparations Directive. Key new features include the introduction of new hazard symbols and new hazard information.

## Quality Mark

Quality Marks identify products and services which are manufactured or sold in accordance with defined quality criteria. The focus is on quality rather than on environmentally relevant aspects. There are currently some 160 quality marks for a wide variety of products and services. RAL Deutsches Institut für Gütesicherung und Kennzeichnung e. V. (German Institute for Quality Assurance and Certification) is responsible for the recognition of Quality Marks. The requirements for individual quality marks are defined in an RAL procedure, drawn up in close collaboration with manufacturers, suppliers, trade, consumers, test institutes and authorities. RAL-recognised quality assurance associations which meet strict quality and test specifications award the Quality Marks to manufacturers and service providers. All Quality Marks are subject to continuous monitoring by a neutral body.



### Further information

- **Standards and standardisation work:** Beuth Publishing House GmbH, Burggrafenstr. 6, 10787 Berlin, phone +49 030 / 26 01-0, [www.beuth.de](http://www.beuth.de); Standards Committee Principles of Environmental Protection (NAGUS) at DIN, Burggrafenstraße 6, 10787 Berlin, Germany, Telephone +49 030 / 26 01-0, [www.din.de/en/getting-involved/standards-committees/nagus](http://www.din.de/en/getting-involved/standards-committees/nagus)
- **CE marks:** NANDO (New Approach Notified and Designated Organisations), the official register of notified bodies for the award of CE markings, <http://ec.europa.eu/growth/tools-databases/nando/>
- **Energy labelling:** Federal Institute for Materials Research and Testing (BAM), Unter den Eichen 87, 12205 Berlin, Germany, Telephone +49 030 / 81 04-0, [ebpg@bam.de](mailto:ebpg@bam.de), <https://netzwerke.bam.de/Netzwerke/Navigation/EN/Ecodesign/ecodesign.html>
- **CLP Regulation:** Federal Institute for Occupational Safety and Health (BAuA), Friedrich-Henkel-Weg 1 – 25, 44149 Dortmund, Germany, Telephone +49 0231 / 90 71-29 71, [reach-clp-biozid@baua.bund.de](mailto:reach-clp-biozid@baua.bund.de), [www.reach-clp-biozid-helpdesk.de/DE/Home/Home-English\\_node.html](http://www.reach-clp-biozid-helpdesk.de/DE/Home/Home-English_node.html)
- **Quality Mark:** RAL Deutsches Institut für Gütesicherung und Kennzeichnung e. V., Fränkische Straße 7, 53229 Bonn, Germany, Telephone +49 0228 / 68 89 50, [www.ral.de/en/](http://www.ral.de/en/)



# III

## Production ratings:

### *Type I ecolabels*

- *Environmental labelling may have an evaluative character, by highlighting environmentally preferable products within a specific product group. The ISO classification system refers to this type of marking as “Type I”. The EN ISO 14024 standard provides guidance on the design of such systems.*

### Type I ecolabels

- Aimed at private and commercial consumers
- Indicate exceptional environmental quality
- Relevant for public procurement
- A high level of credibility and generally very well-known
- Require third-party certification
- Relevant stakeholders are consulted

## 3.1 Product rating based on a criteria matrix

The best-known Type I ecolabels include the German Blue Angel, the Scandinavian Nordic Swan, the Austrian Ecolabel and the European Ecolabel. They are based on catalogues of criteria which are used to evaluate and label products which meet specified environmental performance requirements within selected product categories. Participation in these types of labelling schemes is voluntary for the manufacturer.

**ISO Type I ecolabels are often used in end user advertising thanks to their selective claims.**

Under the ISO system, product labelling based on a criteria matrix is known as “Type I”. Responsibility for awarding the labels may, but need not necessarily, rest with the government.

Standard ISO 14024 offers detailed guidance for organisations wishing to set up a criteria-based product labelling programme. This includes procedural rules explaining, inter alia:

- The selection of product groups,
- The development of environmental criteria,
- The involvement of interested parties,
- Product testing,
- Product certification.

#### Ensuring transparency, creating acceptance

The standard calls for transparent procedures when selecting product categories, environmental criteria, test methods and so on. To encourage acceptance of the ecolabel, interested parties such as companies, associations, non-governmental organisations and scientific institutions should be involved via a formal consultation mechanism from the outset. The standard stipulates that this may include selected groups of representatives, for example in the form of an expert committee or public consultation. ISO 14024 also regulates procedural details such as the validity period for programme requirements, costs and fees.

### Consider the product life cycle

When evaluating products, it is important to consider the entire life cycle. The declared objective of the standard is “to contribute to a reduction in environmental impacts and not merely transferring impacts across media or stages of the product life cycle.” Life cycle stages to be considered include the extraction of raw materials, manufacturing, distribution, use and disposal of the product. However, a full life cycle assessment is not mandatory.

**The standard considers all aspects of criteria-based product evaluation and offers a comprehensive guide to developing an environmental labelling programme.**

## 3.2 The Blue Angel

The Blue Angel is an example of an ISO type I ecolabel. This label is recognised by more than 90 percent of the German public as a German Government ecolabel launched in 1978. Independent and credible, it sets rigorous standards for environmentally friendly products and services, and its criteria are continuously revised and improved. The ecolabel aims to provide consumers, the public sector and industry with reliable product information to promote eco-friendly innovations by creating a specific demand for environmentally friendly products, and in turn help to minimise environmental pollution. The ecolabel promotes environmental, health and consumer protection and is awarded to products which are particularly eco-friendly when all aspects are taken into account whilst at the same time promoting high standards of health protection, work safety and usability.

*Authorisation to use the Blue Angel is usually granted for a period of three or four years. The cost of certification and use of the label is sales-based.*



There are currently over 12,000 Blue Angel products from 1,500 companies in about 110 different product groups. These include paper products, paints, varnishes, sanitary and hygiene products, furniture, household appliances, electrical and office equipment as well as selected gardening and landscaping, interior design, living and renovation, transport and services items.

Independence and credibility are guaranteed by the Environmental Label Jury as the decision-making body, the Federal Environment Ministry as the proprietor of the label, the Federal Environment Agency as the body in charge of formulating the technical principles and award criteria, and RAL gGmbH as the independent certifier.



## How the Blue Angel is awarded

If Blue Angel criteria already exist for the product group in question, interested companies may apply to RAL gGmbH for the award and use of the Blue Angel on their products. Applicants must then provide evidence of compliance with the relevant criteria and requirements. RAL checks the completeness and accuracy of the documents. If the product satisfies the relevant requirements, the parties enter into an agreement on the use of the Blue Angel.

The criteria and application documents can be downloaded from the Internet here: [www.blauer-engel.de/en](http://www.blauer-engel.de/en), where you will also find a list of labelled products. The Blue Angel is used to advertise a product's environmental quality on the German and international markets.

## Blue Angel for low-emission and energy-efficient multifunction devices with print function

IT and communications devices are widely used in offices and private households. In the mid-1990s, the Environmental Label Jury engaged in a series of technical discussions and consultations with office equipment manufacturers, consumer organisations and test/research institutes to formulate the Blue Angel criteria for multifunction devices with print function. Analysis of the life cycle of printers, photocopiers and multifunction devices revealed that most environmental impacts occur during the use phase, and this aspect was therefore given particular consideration when devising the Blue Angel criteria.

Against this background, a matrix of general criteria for office equipment with print functions (printers and multifunction devices) was drawn up:

- Minimum possible electricity consumption
- Minimum possible release of volatile substances and dust into the indoor air during the printing process
- Minimum possible noise emissions
- Durable, recyclable design
- Minimal pollutants and environmentally harmful materials



**Blue Angel criteria** are continuously revised and updated, including those for multifunction devices. For example, the most recent revision in 2016/2017 introduced more stringent maximum values for “typical power consumption” and incorporated additional requirements relating to durability and recyclability of the design. The criteria were also harmonised more closely with other international ecolabels (such as ENERGY STAR®).

This general matrix was incorporated into the Blue Angel award criteria, which sets out specific product requirements together with the required documentation. For example, emissions testing for laser printers includes the identification of volatile organic compounds, gravimetric analysis of fine particles as well as the quantification of fine and ultrafine particles under standardized test conditions in emission test chambers.

If a multifunctional device meets all other safety and environmental requirements as well as the stringent emissions criteria, it will be awarded the Blue Angel. The requirements were revised and tightened in 2013 and 2017 (DE-UZ 205). The ecolabel is currently displayed by more than 1,000 printers and multifunction devices from 14 manufacturers.

### Recycled paper with the Blue Angel satisfies the highest quality standards

The reuse waste paper, especially from household and commercial refuse collections, in the manufacture of paper products helps to conserve resources, minimise waste and significantly reduce the direct environmental impacts of producing virgin fibre paper from chemical and mechanical pulp, particularly in terms of resource consumption, wastewater pollution and water & energy consumption.

- There are seven Blue Angel ecolabels for different product groups manufactured either entirely from wastepaper (recycled paper, finished products made from recovered paper, recycled cardboard, tissue paper and wallpaper) or at least 80 per cent wastepaper (publication paper and printed matter).

The ecolabels for recycled paper and finished products made from recycled paper (DE-UZ 14a and 14b) set out the following specific requirements:

- 100 percent wastepaper containing at least 65 percent lower and medium wastepaper grades
- No use of chlorine, optical brighteners, halogenated bleaching agents or selected other chemicals
- The quality of the finished products must meet the highest requirements such as optimum functionality and printing results. Copier paper with the Blue Angel is tested for technical suitability to EN 12281
- Recycled paper must have a long shelf life of several hundred years (lifespan class LDK 24-85 and DIN 6738)

The ecolabel for recycled paper has proven highly successful and 520 agreements are currently in place for use of this label.



## Low-VOC paint – a very successful ecolabel for 30 years

There is a bewildering choice of paints, varnishes, glazes and undercoats available on the market, making it difficult to select the best product for a given application. However, tens of thousands of tons of solvents are emitted from brushes and spray cans each year, contributing to summer smog and with potentially harmful consequences for human health. Paints that display the Blue Angel label have a particularly low solvent content and can be diluted with water.

The criteria for the Blue Angel (DE-UZ 12a) cover the environmental and health aspects of paints:

- Stringent requirements on potentially harmful additives
- Low solvent content
- Free from harmful plasticizers
- Minimal preservatives

Over 1,000 low-VOC paints and varnishes from 72 suppliers currently carry the Blue Angel.

### How the criteria for a new award decided

Interested parties can submit proposals to the Federal Environment Agency for product groups not currently covered by the Blue Angel award criteria. The independent “Ecolabel Jury”, comprising various interest groups, selects individual product groups for closer examination.

A feasibility study is commissioned to analyse potential product groups and examine the current market situation. The next step is to analyse the product’s environmental impacts and potential for improvement. The Federal Environment Agency devises the relevant criteria based on this information. The German Institute for Quality Assurance and Labelling (RAL gGmbH) organises expert consultations.

### How the basis for a new award is created



\*RAL: German Institute for Quality Assurance and Labelling e. V., Sankt Augustin



### 3.3 The European Ecolabel



The European Ecolabel, created in 1992, identifies products and services with comparatively low environmental impacts. It is organised along similar lines to the Blue Angel. The key requirements for the EU Ecolabel are set out in Regulation (EC) No. 66/2010. Manufacturers may currently apply for the “Euro Flower” – the emblem of the European Ecolabel – in a total of 29 product categories, including paper and paper products, paints and varnishes, television sets, textiles and shoes, detergents and cleaning agents, rinse-off cosmetic products (including shampoos and soaps), floor coverings plus tourist accommodation and camping facilities. The EU Ecolabel is recognised in all 28 EU Member States plus Norway, Iceland, Switzerland and Turkey. The European Commission is the proprietor of the European Ecolabel, while the European Union Eco-labelling Board (EUEB) is its central body, in which all Member States are represented.

#### The EU Ecolabel identifies environmentally friendly detergents and cleaning agents

Detergents and cleaning agents are in daily use throughout all households as well as in trade and industry. Their very omnipresence means that the potential dangers for the environment and health associated with their use are often underestimated. Detergents and cleaning agents discharge significant volumes of chemicals into the sewage system. Products with the EU Ecolabel must be made from raw materials that meet strict environmental and health-related requirements above and beyond the statutory minimum. For example, ecolabel products have fewer impacts on the aquatic environment and are largely biodegradable.

Other criteria include the use of minimal packaging materials and information on ecofriendly practices. What is more, ecolabelled products must be verifiably fit for purpose and meet consumers’ needs, thereby ensuring tested cleaning performance.

The European Ecolabel has six ecolabels for different product groups: Detergents and dishwasher detergents for household use, hand dishwashing detergents, multi-purpose and sanitary detergents as well as industrial and institutional dishwasher and laundry detergents. As well as these traditional ecolabels for detergents and cleaning agents, a European ecolabel for rinse-off cosmetic products has also been developed.



Ecolabels for the laundry and cleaning sector are becoming increasingly popular in the European market. In Germany, the number of companies using the EU Ecolabel has risen steadily. More than 60 companies and over 500 products are currently registered with RAL gGmbH.

#### How the label is awarded

As a first step, companies interested in applying for the European Ecolabel approach the German Institute for Quality Assurance and Labelling (RAL) in Bonn to ascertain whether award criteria already exist for a given product/service in the corresponding product group. If so, the company may apply to RAL. The Institute, as the competent national labelling body, then checks whether the requirements for labelling of the product/service have been met.

#### Adding new product groups

If award criteria do not yet exist for a given product or service, they may be drawn up, to which end proposals may be submitted to the Federal Environment Agency and RAL. The award criteria are developed in consultation with interested parties and incorporate market studies as well as product life cycle aspects.

#### Further information

- **Blue Angel:** RAL Deutsches Institut für Gütesicherung und Kennzeichnung gGmbH, Fränkische Straße 7, 53229 Bonn, Germany, Telephone +49 (0)228 / 68 89 50, [www.ral.de/en/](http://www.ral.de/en/);  
German Environment Agency, “Ecodesign, Environmental Labelling, Environmentally Friendly Public Procurement”, Environmental Label Jury offices, Wörlitzer Platz 1, 06844 Dessau-Roßlau, Germany, Telephone +49 (0)340 / 21 03-0, [www.blauer-engel.de/en](http://www.blauer-engel.de/en)
- **EU Ecolabel:** Eco-Label Helpdesk c/o BIO Intelligence Service S.A.S., 20–22 Villa Deshayes, 75014 Paris, France, Telephone +33 / 01 53 90 11 75, [ecolabel@biois.com](mailto:ecolabel@biois.com), [www.eu-ecolabel.uk](http://www.eu-ecolabel.uk)



# IV

## Making accurate environmental claims:

### *Type II ecolabels and EPDs*

- *Growing numbers of environmental claims are being made in advertising and public relations, on technical information sheets and on packaging. Guaranteed reliability is essential if these claims are to be both credible and useful.*

In this connection, standard EN ISO 14021 supports all product suppliers by regulating a common type of ecolabel and environmental claim known as as Type II under the ISO system.

#### Type II ecolabels and environmental claims

- Usually aimed at private and commercial consumers
- Often focus on a single environmental aspect
- Generally applied to more complex information as well
- Voluntary and therefore the sole responsibility of the issuing party.

### 4.1. Be mindful of market impacts

Unreliable or misleading environmental claims may adversely impact the market, for example by creating barriers to trade or unfair competition (see section 2.3 for details of competition law). EN ISO 14020 requires all environmental claims to be accurate and verifiable. EN ISO 14021 supplements the general standard EN ISO 14020 with methodological procedures and clear requirements for frequently used terms. An amendment to the standard was adopted in 2012 to include various increasingly prominent terms used in environmental claims in recent years. A further editorial revision followed in 2016. The key messages of this standard are summarised below and illustrated by examples.

#### Avoid indeterminate claims

Terms such as “environmentally safe”, “eco-friendly”, “green”, “emission-free”, “ozone-friendly” and so on are vague and may encourage differing expectations. Indeterminate claims that a product benefits the environment should not be used in marketing.

For example, a washing machine manufacturer with the advertising slogan “ECO – the Green Machine” is a vague and unfounded claim and therefore does not comply with the international standard.



*EN ISO 14021 regulates the use of typical environmental claims in the interests of protecting both companies and consumers.*

Labelling pipe insulation or insecticides as “CFC-free” is inappropriate by creating the impression that this is a special product advantage, yet chlorofluorocarbon (CFC) compounds are generally banned from all such products.

### Exercise caution when making specific claims

Environmental claims

- must be accurate and not misleading,
- must be justified and verified,
- must not claim non-existent environmental improvements, either directly or indirectly,
- must not exaggerate a product’s environmental aspects,
- must not be made if they have the potential to be misunderstood by buyers,
- must be clear in their objective: The claim must verifiably apply to the entire product, a specific part, the packaging or a given service sector,
- must apply to the geographical area where environmental pollution occurs.

“Free from ...” is only permitted as an environmental claim if the amount is less than or equal to that which would be found as an acknowledged trace contaminant or natural background level.

If an environmental claim is misleading in isolation, it must be accompanied by an explanatory statement. Explanatory statements are mandatory in all cases unless the claim is applicable to all foreseeable circumstances without exception.

The **recycled content** of a product has been increased from 10 to 15 percent.

The absolute difference is 15 percent minus 10 percent equals 5 percentage points. An environmental claim could highlight the additional 5 percent recycled content. An alternative formulation of a 50 percent increase, although correct, could be misleading if taken to mean 60 percent (initial value of ten percent plus a 50 percent increase).

### Comparative claims

When comparing products or processes,

- all such comparisons may only be based on a published standard or recognised test procedure,
- the comparison must refer to products with corresponding functions that are or were recently offered on the same market,
- environmental aspects must be presented in the same dimensional units, based on the same functional unit and calculated over a reasonable period (usually twelve months).

Where comparative claims are based on percentages, they should also be given as **absolute** differences.

Where comparative claims are based on absolute values, they should also be given as **relative** differences.



**Duty to inform**

The information required to substantiate an environmental claim may be published voluntarily. If not published, it must be disclosed upon request to anyone who asks, at a reasonable cost and allowing for the protection of business secrets.

**Symbols**

The use of symbols is optional for ecolabels and environmental claims and these should be readily distinguishable from other symbols.

**Environmental symbols** which look similar to well-known ecolabels contravene the standard, because consumers could confuse them with official labels and be misled.

## 4.2 Frequently used terms

Various environmental claims are widely used for marketing purposes and in communications between companies. Standard EN ISO 14021 defines selected terms and offers guidance on their use, including terms such as compostable, degradable, recyclable, reduced energy consumption, reusable, sustainable, carbon-neutral and so on.



### Reduced water consumption

EN ISO 14021 states that claims concerning the reduced water consumption of products such as washing machines or hand showers must be justified and satisfy the requirements for comparative claims (see above). Calculations of reduced consumption are based on use of the product and do not include water consumption during production.

### Recycled content

The standard clearly defines recycled content as the percentage by mass of recycled material in a product or packaging. Product and packaging data must not be combined.

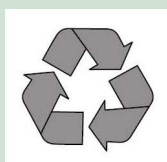
If questioned, companies must be able to supply the procurement documents or other reports verifying the origin and quantity of recycled material. If using imagery to represent the recycled content, it must be the three-arrow symbol with the corresponding percentage value. The three-arrow symbol without a percentage amount merely indicates that a product or packaging is recyclable.

The three-arrow symbol can be used to indicate the recycled content and recyclability of a product or packaging.

### Degradable

Claims relating to degradability refer to the ability of chemical structures to change, leading to the decomposition of a product or material under specified circumstances. Standard EN ISO 14021 states that claims about degradability should include a reference to the test method used. Claims about degradability must also be applicable to the usual disposal channels for that product or packaging. In Germany, the term 'degradable' is usually used with a descriptor, such as biodegradable.

**Anyone who makes an environmental claim is responsible for providing the requisite verification data.**



## Further information

- **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)**, division G II 2, 11055 Berlin, Germany, Telephone +49 (0)30 / 18 30 5-0, [www.bmu.de/en](http://www.bmu.de/en)
- **Federal Association of German Industry e. V. (BDI)**, Energy and Climate Policy, Breite Straße 29, 10178 Berlin, Germany, Telephone +49 (0)30 / 20 28-0, [www.english.bdi.eu](http://www.english.bdi.eu)
- **Consumers International**, 24 Highbury Crescent, London N5 1 RX, United Kingdom, Telephone +44 (0)2 072 266 663, [www.consumersinternational.org](http://www.consumersinternational.org)
- **Association of German Chambers of Industry and Commerce (DIHK)**, InfoCenter, Breite Straße 29, 10178 Berlin, Germany, Telephone +49 (0)30 / 20 30 8-0, [www.dihk.de](http://www.dihk.de)
- **Standards Committee Principles of Environmental Protection (NAGUS) at DIN**, Burggrafenstr. 6, 10787 Berlin, Germany, Telephone +49 (0)30 / 26 01-0, [www.din.de/en/getting-involved/standards-committees/nagus](http://www.din.de/en/getting-involved/standards-committees/nagus)
- **German EMAS Advisory Board (Umweltgutachterausschuss UGA) at the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)**, Gertraudenstraße 20, 10178 Berlin, Germany, Telephone +49 (0)30 / 29 77 32-30, [www.emas.de/meta/english-summary/](http://www.emas.de/meta/english-summary/)
- **Verbraucherzentrale Bundesverband e. V. (Federation of German Consumer Organisations, vzbv)**, Markgrafenstr. 66, 10696 Berlin, Germany, Telephone +49 (0)30 / 25 80 0-0, [www.en.vzbv.de](http://www.en.vzbv.de)





V

## Complex information for the global market

*Type III Environmental Product Declarations (EDPs)*

## ● *Companies are increasingly being asked to supply robust quantitative environmental information*

This aspect focuses on the data used in supply and retail chains. Standard EN ISO 14025 was developed based on this perspective.

### Type III Environmental Product Declarations (EPDs)

- Aimed primarily at manufacturers in the supply chain, trade and commerce, and less at consumers
- Based on a life cycle assessment
- Provide comprehensive quantitative, verified information
- Objectively describe environmental impacts
- Facilitate the aggregation of data across the value chain
- Require independent verification by third parties.

## 5.1 Quantitative and objective

Comprehensive environmental data about a product can boost consumer confidence in the market. It provides detailed information to business partners and helps to support marketing and communications with investors and other stakeholders. International standard EN ISO 14025 provides the basis for quantitative product labelling.

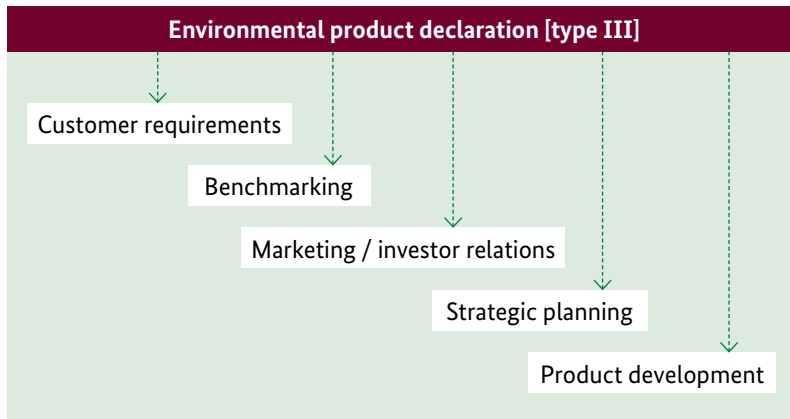
The term Environmental Product Declaration (EPD) has become the widely established term internationally for Type III environmental declarations.

### Three pillars of the declaration

Environmental or type III declarations under the ISO system are based on:

- Life cycle assessments (see Chapter 7) and supplementary environmental information,
- Standardised procedures (Product Category Rules, PCR) developed for individual product groups by the relevant stakeholders
- Independent verification of the declaration.

The procedure ensures a high level of credibility. The standardized methodology allows environmental information to be used at every stage of the value chain in both regional and international markets. Industry- or product group-specific rules and regulations are documented by the Type III environmental declaration programme operator – this could be a manufacturer or trade association, government authority, agency, or independent scientific or other institution.



Alongside the life cycle analysis, type III environmental product declarations may also contain technical information such as the raw materials used, insulating performance, emission characteristics or the manufacturing process of a construction product and its reference life span.

**A company-led initiative**

The Type III environmental product declaration is mainly used for professional information management between companies and other stakeholders. The initiative originates from industry, and participation is voluntary. The process focuses on a product’s functionality and performance and creates a flexible environmental information tool. If a product’s environmental performance improves, the declaration is comparatively easy to modify. Global access to this information is available via the Internet.

National legislation, for example in France or Belgium, has made type III environmental product declarations mandatory for certain construction products if environmental claims not covered by the relevant product standards are included in a manufacturer’s advertising. Other legislative initiatives in the construction sector use EPDs (Environmental Product Declarations) to assess the environmental quality of buildings. Germany has not yet imposed any legal requirements, except in the case of federal government buildings, where application of the Assessment System for Sustainable Building (BNB) is mandatory. The BNB system uses EPD data from the ÖKOBAUDAT (Sustainable Construction Information Portal) platform.



**The declaration process**

If there are declaration criteria to EN ISO 14025 in place for a given product, drafting of the environmental product declaration follows a two-step process:

1. Companies, associations and other organisations formulate the framework conditions for a given product group based on normative rules. These product category rules are reviewed by independent third parties and published in an environmental declaration programme.
2. The interested company applies to the programme operator for an environmental product declaration and supplies the relevant product data. The declaration is prepared based on product-specific requirements. After verification by independent third parties, the declaration is published.

If product category rules already exist for a given product group, companies can go straight to step two and apply to the programme operator. If a company objects to the existing product-specific requirements, they may be changed, subject to further consultation with interested stakeholders.

**Costs**

The main costs associated with an EPD are the life cycle analysis and the organisational effort involved in consulting interested stakeholders and verification. As increasingly sophisticated software tools become available for calculating life cycle assessments, the effort and costs associated with life cycle assessments are gradually being reduced.

**Internal information and control mechanism**

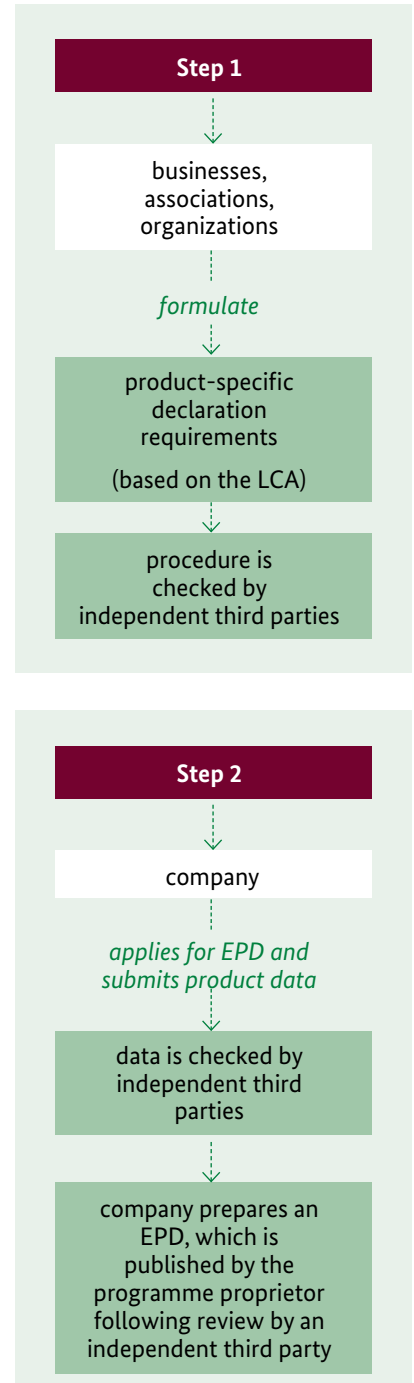
As the demands on companies for sustainable development continue to grow, Type III declarations play a vital role as internal information and control mechanisms. The life cycle assessment underlying the Type III declaration allows manufacturers to identify environmental “hotspots” in the value chain and optimise the environmental credentials of their products and supply chains.

**Benefits to other market players**

As EPDs contain additional information as well as the life cycle assessment, they benefit the entire value chain and all the players involved in a construction project.

For example, waste disposal companies may benefit from the information in a Type III declaration about reusable materials and constituents of construction products. If the data is supplemented with information on product processing and recycling, this improves recyclability.

Type III declarations use a **standardised procedure** to minimise the effort and cost of life cycle assessments.



## 5.2 Experience to date: Focus on construction products

EPDs have become established primarily in Europe and North America as a product-related environmental communications tool and are now becoming increasingly well-known in Asia too. The spectrum of Type III EPDs ranges from simple data sheets to comprehensive brochures.

*Type III declarations provide the data required for an **environmental building assessment** within the context of sustainability evaluation and certification.*

### Construction products

Environmental product declarations have become well-established in Germany and numerous other European countries, particularly in the construction sector. It is important to understand that construction products are rarely end products and do not come into their own until they are reused in components and structures.

In the construction sector, declaration programmes based on European standard EN 15804 currently exist in Germany, England, France, Sweden, Portugal, Spain and the Netherlands. The European ECO Platform is designed to ensure uniform implementation by encouraging the exchange of experience between participating EPD programmes and seeking to harmonise Type III environmental declarations.

### Construction product information for sustainable building

A building's environmental quality is influenced, among other things, by the construction products used. Construction products are subject to different requirements depending on the building type and purpose, as well as its location. As intermediate or semi-finished products, their performance does not develop fully until they are used in components and structures. Against this background, the environmental impacts of a construction product can only be assessed in the building context for a given installation situation.

This approach is now widely accepted in Germany and Europe, thanks in part to the work of the European Committee for Standardisation (CEN/TC/350) on building sustainability. The principal conclusion of this work was that an assessment of environmental building quality should build on the EPDs of the construction products and their product-specific life cycle assessments.







Germany already has certification systems in place for assessing the overall sustainability of buildings that reflect current construction standards in Europe, namely, the Assessment System for Sustainable Building (BNB) of the Federal Ministry of the Interior, Building and Community which applies to government buildings, and the German Sustainable Building Council's DGNB certification system.

The standardisation work by CEN/TC350 also defines the rules for preparation of environmental product declarations in greater detail than the ISO specifications. European standard EN 15804+A1, which entered into force in 2013, sets out basic product category rules (PCR) for Type III environmental declarations with all types of construction products and services. They standardise the indicators and structure of the life cycle assessment as well as the required data collection and calculation methods.

The results of European standardisation work on sustainable building have also for the most part been incorporated into international standard ISO 21930 "Sustainability in buildings and civil engineering works" published in 2017.

### **Programme operators in Germany**

The Institut Bauen und Umwelt e.V. (IBU), an initiative by construction product manufacturers, operates a Type III environmental declaration programme for construction products in Germany in compliance with EN ISO 14025 and EN 15804. Its work is monitored by a group of independent experts in the SVR Advisory Board. The SVR ensures that the Product Category Rules (PCR) developed by the product group forums for selected product groups such as bricks, aerated concrete, construction metals, wood-based materials and insulating materials are compliant with the requirements of the standard. In addition, the SVR acts as an arbitrator in cases of conflict and its proficient, independent auditors provide quality assurance of the pre-publication verification process for environmental declarations.

### **ECO platform: a European umbrella for national programme operators**

The EN 15804 standard prepared the ground for cross-border recognition of Type III environmental declarations for construction products in Europe. The European “ECO-Platform” was founded in June 2013, headquartered in Brussels, as an umbrella organisation for the various national programme operators in Europe with a view to finding a coordinated European-wide solution. Participating programme operators undertake to align their programme rules with DIN EN 15804 and ensure uniform implementation. To this end, they have agreed common quality management principles and verification procedures to ensure that their EPDs contain credible, consistent and comparable information on environmental product performance.

### **New requirements on the marketing of construction products in Europe**

The EU Construction Products Regulation (CPR), which came into force in 2013, replaced the former Construction Products Directive (CPD) and now applies directly in EU Member States. It regulates the marketing of harmonised construction products and outlines seven basic requirements for construction works. For the first time, the new basic requirement no. 7 “Sustainable use of natural resources” addresses the resource efficiency of construction works.

The basic requirements for construction works do not automatically define requirements for construction products, but instead facilitate the consideration of valid requirements in individual Member States when marketing construction products. The Regulation’s recitals explicitly state that environmental product declarations should be used to assess the sustainability of construction works.

## **5.3 Examples from the construction sector**

### **EPD for concrete**

The Bundesverband der Deutschen Transportbetonindustrie e.V. (German Ready-Mixed Concrete Association, BTB) and the Forschungsvereinigung der deutschen Beton- und Fertigteileindustrie e.V., under the leadership of Fachvereinigung Deutscher Betonfertigteilebau e.V., commissioned the German cement industry association (Verein Deutscher Zementwerke e.V., VDZ) to prepare life cycle assessments for six common concrete compressive strength classes. The completed life cycle assessments were submitted to and verified by the Institut Bauen und Umwelt e.V., and the relevant Environmental Product Declarations (EPDs) published in 2013. Once verified, the EPDs are valid for five years from the date of issue and were extensively updated in 2018.

The Environmental Product Declarations refer to one cubic metre of non-reinforced concrete produced in Germany for use in construction components (walls, ceilings, beams, stairs and others), underground construction (e.g. structural components in contact with the soil, foundations) and civil engineering (e.g. bridges) and provide information for assessing the sustainability of construction works, especially in the early planning phases. A decision on whether components will be designed in ready-mixed concrete or as prefabricated components has not usually been reached at this point.

A brochure explaining EPDs for concrete has also been published. It explains how to use the life cycle analysis data in the EPDs and the background to this process. It also classifies the assessed environmental quality of buildings under the national sustainability certification systems.

**Figure 3:** Environmental product declaration (EPD) for concrete (part 1) (InformationsZentrum Beton GmbH)



Figure 4: Environmental product declaration (EPD) for concrete; results of the life cycle analysis (part 2)



**5. LCA: Ergebnisse**

Die Wirkungsabschätzungsergebnisse stellen nur relative Aussagen dar. Sie machen keine Aussagen über Endpunkte der Wirkungskategorien, Überschreitungen von Schwellenwerten, Sicherheitsmargen oder über Risiken. Für die Berechnung wurden CML-Faktoren der Version Oktober 2012 verwendet.

**ANGABE DER SYSTEMGRENZEN (X = IN ÖKOBLANZ ENTHALTEN; MND = MODUL NICHT DEKLARIERT)**

| Produktionsstadium   |           |             | Stadium der Errichtung des Bauwerks              |         |                     |                |           | Nutzungsstadium |            |   |  |                  | Entsorgungsstadium |                  |             |  | Gutschriften und Lasten außerhalb der Systemgrenze |
|----------------------|-----------|-------------|--|---------|---------------------|----------------|-----------|-----------------|------------|---|--|------------------|--------------------|------------------|-------------|--|--|
| Roherstoffversorgung | Transport | Herstellung | Transport vom Hersteller zum Verwendungsstandort | Montage | Nutzung / Anwendung | Instandhaltung | Reparatur | Ersatz          | Entsorgung | Energieerzeugung für das Betreiben des Gebäudes | Wasserversatz für das Betreiben des Gebäudes | Rückbau / Abriss | Transport          | Abfallbehandlung | Beseitigung | Wiederverwendungs- oder Recyclingpotenzial |  |
| A1                   | A2        | A3          | A4   | A5      | B1                  | B2             | B3        | B4              | B5         | B6  | B7   | C1               | C2                 | C3               | C4          | D  |  |
| X                    | X         | X           | X  | X       | X                   | MND            | MNR       | MNR             | MNR        | MND   | MND  | X                | X                  | X                | MND         | X  |  |

**ERGEBNISSE DER ÖKOBLANZ UMWELTAUSWIRKUNGEN: 1 m³ Konstruktionsbeton C 20/25**

| Parameter | Einheit                 | A1-A3   | A4       | A5       | B1      | C1       | C2       | C3       | D         |
|-----------|-------------------------|---------|----------|----------|---------|----------|----------|----------|-----------|
| GWP       | kg CO <sub>2</sub> -Äq. | 179,00  | 3,90     | 1,06     | -8,00   | 3,30     | 11,00    | 6,00     | -21,40    |
| ODP       | kg CFC-11-Äq.           | 4,78E-6 | 7,02E-3  | 4,75E-12 | 0,00E+0 | 6,09E-13 | 2,53E-12 | 1,53E-11 | -1,32E-10 |
| AP        | kg SO <sub>2</sub> -Äq. | 2,95E-1 | 8,99E-3  | 1,60E-3  | 0,00E+0 | 3,07E-2  | 3,21E-2  | 1,13E-2  | -4,73E-2  |
| EP        | kg PCP-Äq.              | 4,98E-2 | 2,39E-3  | 2,53E-4  | 0,00E+0 | 6,53E-3  | 7,69E-3  | 2,17E-3  | -6,66E-3  |
| POCP      | kg lichen-Äq.           | 2,09E-2 | -3,36E-3 | 1,11E-4  | 0,00E+0 | 3,19E-3  | -1,11E-2 | 9,74E-4  | -2,79E-3  |
| ADPF      | kg 36-Aq.               | 6,09E-4 | 4,19E-7  | 5,99E-7  | 0,00E+0 | 3,29E-7  | 1,29E-6  | 1,99E-6  | -6,00E-6  |
| ADFP      | MJ                      | 919,00  | 52,70    | 13,99    | 0,00    | 41,90    | 93,00    | 78,70    | -279,00   |

Legende: GWP = Globales Erwärmungspotenzial; ODP = Abbau Potenzial der stratosphärischen Ozonschicht; AP = Versauerungspotenzial von Boden und Wasser; EP = Eutrophierungspotenzial; POCP = Bildungspotenzial für troposphärisches Ozon; ADPF = Potenzial für die Verknappung von abiotischen Ressourcen - nicht fossile Ressourcen (ADP - Stoffe); ADFP = Potenzial für die Verknappung abiotischer Ressourcen - fossile Brennstoffe (ACP - fossile Energieträger).

**ERGEBNISSE DER ÖKOBLANZ RESSOURCENEINSAZ: 1 m³ Konstruktionsbeton C 20/25**

| Parameter | Einheit | A1-A3  | A4    | A5    | B1   | C1    | C2    | C3    | D       |
|-----------|---------|--------|-------|-------|------|-------|-------|-------|---------|
| PERE      | MJ      | 180,00 | 3,90  | 5,89  | 0,00 | 2,86  | 11,00 | 20,70 | -64,10  |
| PERM      | MJ      | 0,00   | 0,00  | 0,00  | 0,00 | 0,00  | 0,00  | 0,00  | 0,00    |
| PERT      | MJ      | 180,00 | 3,90  | 5,89  | 0,00 | 2,86  | 11,00 | 20,70 | -64,10  |
| PENRE     | MJ      | 912,00 | 52,70 | 13,99 | 0,00 | 41,90 | 93,00 | 78,70 | -279,00 |
| PENRM     | MJ      | 0,00   | 0,00  | 0,00  | 0,00 | 0,00  | 0,00  | 0,00  | 0,00    |
| PENRT     | MJ      | 912,00 | 52,70 | 13,99 | 0,00 | 41,90 | 93,00 | 78,70 | -279,00 |
| SM        | kg      | 23,00  | 0,00  | 0,00  | 0,00 | 0,00  | 0,00  | 0,00  | 2400,00 |
| RSF       | MJ      | 186,00 | 0,00  | 0,00  | 0,00 | 0,00  | 0,00  | 0,00  | 0,00    |
| NRSF      | MJ      | 311,00 | 0,00  | 0,00  | 0,00 | 0,00  | 0,00  | 0,00  | 0,00    |
| FW        | kg      | 0,76   | 0,00  | 0,00  | 0,00 | 0,00  | 0,00  | 0,00  | -1,26   |

Legende: PERE = Erneuerbare Primärenergie als Energieträger; PERM = Erneuerbare Primärenergie zur stofflichen Nutzung; PERT = Total erneuerbare Primärenergie; PENRE = Nicht-erneuerbare Primärenergie als Energieträger; PENRM = Nicht-erneuerbare Primärenergie zur stofflichen Nutzung; PENRT = Total nicht-erneuerbare Primärenergie; SM = Einsatz von Sekundärstoffen; RSF = Erneuerbare Sekundärstoffe; NRSF = Nicht-erneuerbare Sekundärstoffe; FW = Einsatz von Süßwasserressourcen.

**ERGEBNISSE DER ÖKOBLANZ OUTPUT-FLÜSSE UND ABFALLKATEGORIEN: 1 m³ Konstruktionsbeton C 20/25**

| Parameter | Einheit | A1-A3   | A4      | A5      | B1      | C1      | C2      | C3      | D        |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| HWD       | kg      | 2,59E-4 | 3,31E-6 | 1,29E-6 | 0,00E+0 | 2,62E-6 | 1,02E-5 | 2,33E-6 | -3,59E-6 |
| NHW0      | kg      | 40,13   | 0,00    | 0,01    | 0,00    | 0,00    | 0,01    | 0,00    | -40,30   |
| RWD       | kg      | 3,70E-2 | 7,89E-5 | 1,26E-3 | 0,00E+0 | 6,33E-5 | 2,42E-4 | 4,60E-2 | -2,97E-2 |
| CRU       | kg      | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00     |
| MFR       | kg      | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 2800,00 | 0,00     |
| MER       | kg      | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00     |
| EEE       | MJ      | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00     |
| EET       | MJ      | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00    | 0,00     |

Legende: HWD = Gefährlicher Abfall zur Deponie; NHW0 = Entsorgter nicht gefährlicher Abfall; RWD = Entsorgter radioaktiver Abfall; CRU = Komponenten für die Wiederverwendung; MFR = Stoffe zum Recycling; MER = Stoffe für die Energieerzeugung; EEE = Exportierte Energie elektrisch; EET = Exportierte Energie thermisch.

Im Wert für das GWP der Module A1 bis A3 nicht enthalten sind 26 kg CO<sub>2</sub>-Äq. aus der Verbrennung von Abfällen bei der Zementklinkerherstellung. Nach dem Verursacherprinzip (DIN EN 15804) sind diese dem Produktsystem zuzuordnen, das den Abfall verursacht hat. Aus Transparenzgründen wird der Wert hier jedoch zusätzlich angegeben: GWP inkl. Verbrennung von Abfällen bei der Klinkerherstellung: 204 CO<sub>2</sub>-Äq.. So soll über Ländergrenzen hinweg die Vergleichbarkeit von berechneten Treibhauspotenzialen für Zemente auch dann sichergestellt werden, falls die bei der Klinkerherstellung eingesetzten Sekundärbrennstoffe in anderen Ländern keinen Abfallstatus haben sollten.

### EPDs for rock wool and titanium zinc

As the first stage in preparing type III environmental product declarations for DEUTSCHE ROCKWOOL and Rheinzink, a product group forum appointed by the programme operator Institut Bauen und Umwelt e.V. (IBU) formulated specific requirements for the relevant product groups - mineral insulation materials and architectural metals.

Next, the product-specific requirements were reviewed by the IBU's independent Advisory Board (SVR) to verify completeness and compliance with the requirements of standards EN ISO 14025 and EN 15804.

The product life cycle analyses were then calculated on this basis, and the corresponding environmental declarations reviewed by an independent third party and published in a uniform format.

As well as a product life cycle assessment comprising a total of 24 indicators quantifying the principal environmental impacts, use of resources and waste volume, the IBU environmental product declaration also includes a comprehensive product description comprising technical performance details, processing guidelines, as well as information on the use.

**Figure 5:** Product Category Rules (PCR) for mineral insulating materials (Institut für Bauen und Umwelt) and an environmental product declaration (EPD) for rockwool insulating materials (Deutsche Rockwool) (Part 1)



PCR guide text



Environmental declaration

Figure 6: Declaration for rockwool insulating materials (Deutsche Rockwool); results of the life cycle assessment (part 2)



**5. LCA: Ergebnisse**

Es folgt die Darstellung der Umweltwirkungen für 1 m<sup>3</sup> unkaschierte Steinwolle mit einer durchschnittlichen Rohdichte von 155 kg/m<sup>3</sup>, hergestellt von der DEUTSCHE ROCKWOOL GmbH & Co. KG. Die folgende Tabelle zeigt die Ergebnisse der Indikatoren der Wirkungsabschätzung, des Ressourceneinsatzes sowie zu Abfällen und sonstigen Output-Strömen bezogen auf 1 m<sup>3</sup> Steinwollendämmstoff. Die mit „x“ gekennzeichneten Module nach /DIN EN 15804/ werden hierbei adressiert. Die Umweltwirkungen und Sachbilanzindikatoren für die verschiedenen Kaschierungen sind dem Anhang zu entnehmen.

**ANGABE DER SYSTEMGRENZEN (X = IN ÖKOBILANZ ENTHALTEN; MND = MODUL NICHT DEKLARIERT)**

| Produktionsstadium |           | Stadium der Errichtung des Bauwerks |   | Nutzungsstadium |                     |                |           |        |            |   |  |                  | Entsorgungsstadium |                  |             |   | Gutschriften und Lasten außerhalb der Systemgrenze |
|--------------------|-----------|-------------------------------------|---|-----------------|---------------------|----------------|-----------|--------|------------|---|--|------------------|--------------------|------------------|-------------|---|--|
| Rohstoffversorgung | Transport | Herstellung                         | Transport vom Hersteller zum Verwendungsort | Montage         | Nutzung / Anwendung | Instandhaltung | Reparatur | Ersatz | Erneuerung | Energieeinsatz für das Betreiben des Gebäudes | Wassereinsatz für das Betreiben des Gebäudes | Rückbau / Abriss | Transport          | Abfallbehandlung | Beseitigung | Wiederverwendungs-, Rückgewinnungs- oder Recyclingpotenzial |  |
| A1                 | A2        | A3                                  | A4  | A5              | B1                  | B2             | B3        | B4     | B5         | B6  | B7   | C1               | C2                 | C3               | C4          | D   |  |
| X                  | X         | X                                   | X   | X               | MND                 | MND            | MNR       | MNR    | MNR        | MND   | MND  | X                | X                  | X                | X           | X   |  |

**ERGEBNISSE DER ÖKOBILANZ UMWELTAUSWIRKUNGEN: 1 m<sup>3</sup> ROCKWOOL-Steinwolle, 155 kg/m<sup>3</sup>**

| Parameter | Einheit                   | A1-A3    | A4       | A5       | C1      | C2       | C3      | C4       | D         |
|-----------|---------------------------|----------|----------|----------|---------|----------|---------|----------|-----------|
| GWP       | [kg CO <sub>2</sub> -Äq.] | 196.64   | 3.16     | 16.49    | 0.00    | 0.51     | 0.00    | 2.46     | -5.42     |
| ODP       | [kg CFC11-Äq.]            | 2.62E-10 | 1.31E-13 | 5.18E-12 | 0.00E+0 | 2.11E-14 | 0.00E+0 | 5.57E-13 | -4.14E-12 |
| AP        | [kg SO <sub>2</sub> -Äq.] | 9.44E-1  | 2.74E-3  | 2.07E-2  | 0.00E+0 | 4.42E-4  | 0.00E+0 | 1.46E-2  | -5.81E-3  |
| EP        | [kg PO <sub>4</sub> -Äq.] | 1.05E-1  | 6.37E-4  | 2.48E-3  | 0.00E+0 | 1.03E-4  | 0.00E+0 | 2.01E-3  | -9.74E-4  |
| POCP      | [kg Ethen-Äq.]            | 4.66E-2  | -2.21E-5 | 1.05E-3  | 0.00E+0 | -3.59E-6 | 0.00E+0 | 1.13E-3  | -4.96E-4  |
| ADPE      | [kg St-Äq.]               | 4.07E-5  | 2.80E-7  | 9.99E-7  | 0.00E+0 | 4.50E-8  | 0.00E+0 | 9.45E-7  | -2.09E-6  |
| ADPF      | [MJ]                      | 1724.91  | 42.92    | 39.20    | 0.00    | 6.91     | 0.00    | 31.80    | -69.77    |

Legende: GWP = Globales Erwärmungspotenzial; ODP = Abbau Potential der stratosphärischen Ozonschicht; AP = Versauerungspotenzial von Boden und Wasser; EP = Eutrophierungspotenzial; POCP = Bildungspotenzial für troposphärisches Ozon; ADPE = Potential für die Verknappung von abiotischen Ressourcen - nicht fossile Ressourcen (ADP - Stoffe); ADPF = Potential für die Verknappung abiotischer Ressourcen - fossile Brennstoffe (ADP - fossile Energieträger)

**ERGEBNISSE DER ÖKOBILANZ RESSOURCENEINSATZ: 1 m<sup>3</sup> ROCKWOOL-Steinwolle, 155 kg/m<sup>3</sup>**

| Parameter | Einheit           | A1-A3   | A4      | A5      | C1      | C2      | C3      | C4      | D        |
|-----------|-------------------|---------|---------|---------|---------|---------|---------|---------|----------|
| PERE      | [MJ]              | 160.32  | 2.25    | 95.03   | 0.00    | 0.36    | 0.00    | 4.09    | -17.09   |
| PERM      | [MJ]              | 118.27  | 0.00    | -68.82  | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| PERT      | [MJ]              | 283.61  | 2.25    | 6.31    | 0.00    | 0.36    | 0.00    | 4.09    | -17.09   |
| PENRE     | [MJ]              | 1448.77 | 43.15   | 82.91   | 0.00    | 6.95    | 0.00    | 33.01   | -78.87   |
| PENRM     | [MJ]              | 231.78  | 0.00    | -44.23  | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| PENRT     | [MJ]              | 1836.01 | 43.15   | 41.72   | 0.00    | 6.95    | 0.00    | 33.01   | -78.87   |
| SM        | [kg]              | 37.11   | 0.00    | 0.74    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| RSF       | [MJ]              | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| NRSF      | [MJ]              | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| FW        | [m <sup>3</sup> ] | 4.59E-1 | 4.15E-3 | 3.67E-2 | 0.00E+0 | 6.68E-4 | 0.00E+0 | 6.30E-3 | -1.06E-2 |

Legende: PERE = Erneuerbare Primärenergie als Energieträger; PERM = Erneuerbare Primärenergie zur stofflichen Nutzung; PERT = Total erneuerbare Primärenergie; PENRE = Nicht-erneuerbare Primärenergie als Energieträger; PENRM = Nicht-erneuerbare Primärenergie zur stofflichen Nutzung; PENRT = Total nicht-erneuerbare Primärenergie; SM = Einsatz von Sekundärstoffen; RSF = Erneuerbare Sekundärbrennstoffe; NRSF = Nicht-erneuerbare Sekundärbrennstoffe; FW = Einsatz von Süßwasserressourcen

**ERGEBNISSE DER ÖKOBILANZ OUTPUT-FLUSSE UND ABFALLKATEGORIEN: 1 m<sup>3</sup> ROCKWOOL-Steinwolle, 155 kg/m<sup>3</sup>**

| Parameter | Einheit | A1-A3   | A4      | A5      | C1      | C2      | C3      | C4      | D        |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| HWD       | [kg]    | 3.46E-6 | 2.29E-6 | 1.72E-7 | 0.00E+0 | 3.66E-7 | 0.00E+0 | 5.68E-7 | -4.47E-8 |
| NHWD      | [kg]    | 1.21E+1 | 3.49E-3 | 3.38E+0 | 0.00E+0 | 5.58E-4 | 0.00E+0 | 1.59E+2 | -4.32E-2 |
| RWD       | [kg]    | 4.14E-2 | 9.02E-5 | 9.44E-4 | 0.00E+0 | 1.45E-5 | 0.00E+0 | 4.79E-4 | -3.60E-3 |
| CRU       | [kg]    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| MFR       | [kg]    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| MER       | [kg]    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| EEE       | [MJ]    | 0.00    | 0.00    | 17.16   | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |
| EET       | [MJ]    | 0.00    | 0.00    | 39.57   | 0.00    | 0.00    | 0.00    | 0.00    | 0.00     |

Legende: HWD = Gefährlicher Abfall zur Deponie; NHWD = Entsorgter nicht gefährlicher Abfall; RWD = Entsorgter radioaktiver Abfall; CRU = Komponenten für die Wiederverwendung; MFR = Stoffe zum Recycling; MER = Stoffe für die Energierückgewinnung; EEE = Exportierte Energie elektrisch; EET = Exportierte Energie thermisch



phase, behaviour under exceptional conditions such as fire and humidity, and disposal and recycling options.

Depending on the relevance for a given product group, the independent Advisory Board may request additional environmental and health-related documentation, e.g. regarding indoor VOC emissions.

**Figure 7:** Product Category Rules (PCR) for architectural metals (Institut für Bauen und Umwelt) and EPD for titanium zinc (Rheinzink) (Part 1)



PCR guide text



Environmental declaration

Sample EPDs for construction chemicals

A joint project by the three organisations affiliated to the Chemical Industry Association (VCI) (Deutsche Bauchemie, Industrieverband Klebstoffe and Verband der deutschen Lack- und Druckfarbenindustrie) in

Figure 8: EPD for titanium zinc (part 2), results of the life cycle assessment (Rheinzink)



5. LCA: Ergebnisse

ANGABE DER SYSTEMGRENZEN (X = IN OKOBILANZ ENTHALTEN; MND = MODUL NICHT DEKLARIERT)

| Produktionsstadium  |           | Stadium der Errichtung des Bauwerks |   | Nutzungsstadium |                     |                |           |        |            |  |   | Entsorgungsstadium |           |                  |             | Gutschriften und Lasten außerhalb der Systemgrenze |
|---------------------|-----------|-------------------------------------|---|-----------------|---------------------|----------------|-----------|--------|------------|--|---|--------------------|-----------|------------------|-------------|--|
| Rohestoffversorgung | Transport | Herstellung                         | Transport vom Hersteller zum Verwendungsort | Montage         | Nutzung / Anwendung | Instandhaltung | Reparatur | Ersatz | Erneuerung | Energieersatz für das Betreiben des Gebäudes | Wasserersatz für das Betreiben des Gebäudes | Rückbau / Abriss   | Transport | Abfallbehandlung | Beseitigung | Wiederverwendungs- oder Recyclingpotenzial         |
| A1                  | A2        | A3                                  | A4  | A5              | B1                  | B2             | B3        | B4     | B5         | B6   | B7  | C1                 | C2        | C3               | C4          | D  |
| X                   | X         | X                                   | MND   | MND             | MND                 | MND            | MNR       | MNR    | MNR        | MND  | MND   | MND                | MND       | MND              | MND         | X  |

ERGEBNISSE DER OKOBILANZ UMWELTAUSWIRKUNGEN: 1 kg prePATINA walzblank

| Parameter   | Einheit                      | A1-A3   | D        |
|---|------------------------------|---------|----------|
| Globales Erwärmungspotenzial                                  | [kg CO <sub>2</sub> -Äq]     | 3,60E+0 | -2,60E+0 |
| Abbau Potenzial der stratosphärischen Ozonschicht             | [kg CFC11-Äq]                | 3,30E-7 | -3,00E-7 |
| Versauerungspotenzial von Boden und Wasser                    | [kg SO <sub>2</sub> -Äq]     | 2,50E-2 | -1,90E-2 |
| Eutrophierungspotenzial                                       | [kg (PO <sub>4</sub> -P)-Äq] | 2,50E-3 | -2,10E-3 |
| Bildungspotenzial für troposphärisches Ozon                   | [kg Ethin-Äq]                | 1,40E-3 | -1,10E-3 |
| Potenzial für den abiotischen Abbau nicht fossiler Ressourcen | [kg Sb-Äq]                   | 1,90E-4 | -1,60E-4 |
| Potenzial für den abiotischen Abbau fossiler Brennstoffe      | [MJ]                         | 3,50E+1 | -2,50E+1 |

ERGEBNISSE DER OKOBILANZ RESSOURCENEINSATZ: 1 kg prePATINA walzblank

| Parameter   | Einheit           | A1-A3   | D        |
|---|-------------------|---------|----------|
| Erneuerbare Primärenergie als Energieträger             | [MJ]              | 8,30E+0 | -6,70E+0 |
| Erneuerbare Primärenergie zur stofflichen Nutzung       | [MJ]              | 0,00    | 0,00     |
| Total erneuerbare Primärenergie                         | [MJ]              | 8,30E+0 | -6,70E+0 |
| Nicht-erneuerbare Primärenergie als Energieträger       | [MJ]              | 4,70E+1 | -3,50E+1 |
| Nicht-erneuerbare Primärenergie zur stofflichen Nutzung | [MJ]              | 0,00    | 0,00     |
| Total nicht-erneuerbare Primärenergie                   | [MJ]              | 4,70E+1 | -3,50E+1 |
| Einsatz von Sekundärstoffen                             | [t]               | 0,00E+0 | 0,00E+0  |
| Erneuerbare Sekundärrohstoffe                           | [MJ]              | 2,50E-4 | -4,00E-3 |
| Nicht-erneuerbare Sekundärrohstoffe                     | [MJ]              | 2,60E-3 | -4,20E-2 |
| Einsatz von Süßwasserressourcen                         | [m <sup>3</sup> ] | IND     | IND      |

ERGEBNISSE DER OKOBILANZ OUTPUT-FLUSSE UND ABFALLKATEGORIEN: 1 kg prePATINA walzblank

| Parameter                            | Einheit | A1-A3   | D        |
|--------------------------------------|---------|---------|----------|
| Gefährlicher Abfall zur Deponie      | [kg]    | IND     | IND      |
| Entsorger nicht gefährlicher Abfall  | [kg]    | IND     | IND      |
| Entsorger radioaktiver Abfall        | [kg]    | 4,60E-3 | -3,60E-3 |
| Komponenten für die Wiederverwendung | [kg]    | IND     | IND      |
| Stoffe zum Recycling                 | [kg]    | 0,00E+0 | 9,60E-1  |
| Stoffe für die Energieerzeugung      | [kg]    | IND     | IND      |
| Exportierte elektrische Energie      | [MJ]    | IND     | IND      |
| Exportierte thermische Energie       | [MJ]    | IND     | IND      |

Bitte Beachten Sie: Die Indikatoren "Einsatz von Süßwasserressourcen" und "Entsorger nicht gefährlicher Abfall" sind in dieser EPD nicht deklariert, da die Hintergrunddatenbanken nicht mit der Interpretation des IBU SVR der EN 15804 im Einklang stehen (Siehe SVR Beschluss Nr. 20121004-1 vom 04.10.2012)



collaboration with Institut Bauen und Umwelt as programme operator prepared sample EPDs for construction chemicals used in a wide range of technical applications in the construction sector. The key feature of this scheme is that, subject to certain requirements, members of the relevant organisations can “customise” the sample declarations to their own requirements. A recipe comparison ensures that the environmental impacts of a manufacturer’s specific product do not exceed those of the underlying product on which the sample environmental declaration is based. This translates into enormous cost savings for the individual manufacturer.

The national sample EPDs have since been converted into European sample EPDs in collaboration with European associations, and manufacturers across Europe are now able to access the sample EPDs for construction chemicals. The European sample EPDs can be found on the websites of the Association of the European Adhesives & Sealant Industry (FEICA) and the European Federation of Concrete Admixtures Associations (EFCA).

**Figure 9:** From sample EPD to manufacturer-specific EPD



Sample environmental declaration

Customised environmental declaration



### EPD for insulating glass

Flat glass is a classic intermediate product in the construction industry, used mainly for windows and doors. In order to prepare the environmental product declarations required by architects, planners, investors and construction companies, the processors and finishers of flat glass rely on relevant information from the manufacturer.

Saint-Gobain Glass was the first company in the flat glass industry to use specific EPDs for its products rather than relying on average data. Saint-Gobain Glass has since produced 20 EPDs, including one for its product CLIMATOP triple glazing with high thermal insulation. The EPDs were created on the basis of EN 15804 and reviewed by an independent third party (EPD verified), providing an additional layer of data quality and reliability. As well as providing information on product properties and a life cycle analysis of environmental impacts, the EPDs also incorporate an assessment of health risks and their contribution to cost efficiency.

#### Further information

- **Association of the European Adhesives & Sealants Industry (FEICA)**, Avenue Edmond Van Nieuwenhuysse 2, 1160 Brussels, Belgium, Telephone +32 / 028 969 600, [www.feica.eu/our-priorities/key-projects/epds.aspx](http://www.feica.eu/our-priorities/key-projects/epds.aspx)
- **Bundesverband Baustoffe – Steine und Erden e.V.**, Kochstraße 6 bis 7, 10969 Berlin, Germany, Telephone +49 (0)30 / 72 61 99 9-0, [www.bvbaustoffe.de](http://www.bvbaustoffe.de)
- **ECO Platform AISBL, c/o Construction Products Europe AISBL**, Boulevard du Souverain 68, 1170 Brussels, Belgium, [www.eco-platform.org](http://www.eco-platform.org)
- **European Federation of Concrete Admixtures Associations (EFCA)**, Telephone +32 / 06 45 52 12, [www.efca.info/efca-publications/environmental/](http://www.efca.info/efca-publications/environmental/)
- **EPD International AB**, Valhallavägen 81, SE-114 27 Stockholm, Sweden, [info@environdec.com](mailto:info@environdec.com), [www.environdec.com](http://www.environdec.com)
- **Informationsportal Nachhaltiges Bauen – Bundesministerium des Innern, für Bau und Heimat**, Alt-Moabit 140, 10557 Berlin, Germany, [www.nachhaltigesbauen.de/sustainable-building-english-speakinginformation/sustainable-building.html](http://www.nachhaltigesbauen.de/sustainable-building-english-speakinginformation/sustainable-building.html)
- **Institut Bauen und Umwelt e.V.**, Panoramastraße 1, 10178 Berlin, Germany, Telephone +49 (0)30 / 30 87 74 8-0, [www.ibu-epd.com/en/](http://www.ibu-epd.com/en/)
- **DIN Standards Committee Building and Civil Engineering**, Burggrafenstraße 6, 10787 Berlin, Germany, Telephone (0)30 / 2 60 1-0, [www.din.de/getting-involved/standards-committees/nabau](http://www.din.de/getting-involved/standards-committees/nabau)
- **German Environment Agency (Umweltbundesamt, UBA), Material-Related Product Issues**, Wörlitzer Platz 1, 06844 Dessau-Roßlau, Germany, Telephone +49 (0)340 / 2 10 3-0, [www.umweltbundesamt.de/en](http://www.umweltbundesamt.de/en)



# VI

## Other voluntary ecolabels

- *Standards emerge from the market's requirements. The ISO 14020 family of standards was preceded by a number of voluntary product labels focussing on environmental aspects.*

Standards emerge from the market's requirements. The ISO 14020 family of standards was preceded by various voluntary product labels focusing on environmental aspects. While not strictly compliant with the ISO standard system, they do contain various elements of the different ISO types, such as certain certification procedures or participation of the

general public. Several examples are outlined below, aimed both at end customers and professional buyers.

## FSC® AND PEFC™



The trademarks of the Forest Stewardship Council (FSC®) and Programme for the Endorsement of Forest Certification (PEFC™) identify timber products such as windows, doors, furniture and paper from sustainably managed forests. These two non-governmental international organisations are committed environmentally appropriate, socially beneficial, financially viable forest management. FSC® was established in 1993 in a collaboration between environmental organisations, the timber industry, the forestry sector and indigenous peoples' organisations, while PEFC™ was created in 1999 by forest owners and representatives of the timber industry.

In 2016, more than 77 percent of forest land in Germany was certified: 7.3 million hectares (around 67 percent) under PEFC™ criteria and 1.18 million hectares (around 11 percent) under FSC® criteria. Worldwide, some 300 million hectares are certified to PEFC™ and around 179 million hectares to FSC®.

### How the trademark is awarded

While PEFC™ certification is awarded at a regional level with companies audited in a random sample process, the FSC® generally certifies and audits individual companies, although it also offers group certification to facilitate access to the certification process.

The general principles and criteria of FSC® international are globally binding for every FSC® certificate and are supplemented by specific indicators adapted to the regional conditions. FSC® facilitates the certification of forest land and forest management companies in a particular country, and local stakeholder involvement is not mandatory. By contrast, PEFC™ is a platform for the recognition national certification systems which must always be drawn up in situ with local stakeholders. Applicants must comply with minimum standards as a prerequisite for recognition.

In timber-processing companies, it is vital to monitor the flow of materials. This must be verified by testing, and product descriptions must make explicit reference to this fact. Both certificates require uninterrupted traceability from the original producer through to the final seller, known as a chain of custody.

## 6.2 Textile labels: Flow of information that transcends global production chains

As well as the Blue Angel and the EU Ecolabel, there are numerous other textile seals verifying compliance with a range of environmental and/or social requirements at various stages in the production chain for the benefit of consumers. Three examples are described below.

### OEKO-TEX®

OEKO-TEX® has been offering voluntary, independent testing systems to manufacturers of textiles and leather goods since 1992, covering both end products and manufacturing conditions.

#### Differentiated testing of harmful substances

To date, more than 160,000 certificates have been issued to some 10,000 companies worldwide under the STANDARD 100 by OEKO-TEX®, covering millions of textile products. The label was created in 1992 at a time when the potential health threats associated with textiles was a hotly debated topic among the general public and in the media. Today, the information and certification system has more than 18 test institutes in Europe and Japan, and the STANDARD 100 by OEKO-TEX® is used by textile companies in over 100 countries, primarily in Europe and Asia.

Fabricated textiles and intermediate products are analysed for a detailed set of potentially harmful substances such as formaldehyde, heavy metals such as nickel and cadmium, pesticides, chlorinated phenols as well as carcinogenic and allergenic dyes and other substances. The OEKO-TEX® tests go far beyond the legally prescribed standards in Germany and beyond. As this industry is characterised by a particularly international division of labour, the document “STANDARD 100 by OEKO-TEX® – Test procedures” offers uniform global test methods for harmful substances in textile products.

#### MADE IN GREEN by OEKO-TEX®: Sustainability in the supply chain

The MADE IN GREEN label is awarded to textiles and leather items which have been tested for harmful substances and monitored to ensure environmentally friendly production facilities and socially responsible working conditions.



**Figure 10:** Diagram of the textile production chain

As well as the “STANDARD 100 by OEKOTEX®”, countless other product modules are available in the **OEKO-TEX® Community**. Examples include leather goods which have been tested for harmful substances (“LEATHER STANDARD by OEKOTEX®”, the certification of sustainable production plants (“STeP by OEKO-TEX®”) and sustainable chemicals management (“ECO PASSPORT” and “DETOX TO ZERO by OEKO TEX®”).

### Peace of mind for companies and consumers

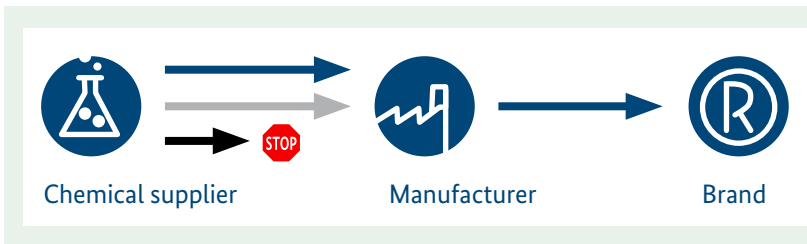
The certificate number displayed on every STANDARD 100 label allows complete traceability back to the company that marketed the product. Further information about certified products is available in an expert report. The modular principle offers peace of mind for both processors and consumers. Analogous to this, MADE IN GREEN provides information about the production plant where the textile or leather item was produced and the countries where it was manufactured from the product ID or QR code. Products can be traced on the [www.oeko-tex.com](http://www.oeko-tex.com) website by clicking on the “Label Check” feature.

#### bluesign®

The bluesign® SYSTEM certifies finished textile products and textile items at various processing stages (such as yarns, semi-finished goods, finished fabrics, accessories) and auxiliaries and dyes used in the textile industry. This certification system, administered by Label Proprietors Bluesign Technologies AG, collaborates with manufacturers at every stage of the textile chain, including the producers of chemicals used in the textile process. The network seeks to minimise environmental impacts throughout the entire value chain, and to optimise work safety and consumer protection. ([www.bluesign.com](http://www.bluesign.com))

### A systematic approach with “input stream management”

The independent bluesign® SYSTEM is based on the unique approach of minimising environmental pollution at every stage of the production process. Input stream management ensures that all substances and raw materials used in production are checked before production even begins. In other words, rather than testing the finished products, the bluesign® SYSTEM takes effect right at the start of the production process. Suppliers, manufacturers and brands must therefore undergo stringent testing to guarantee compliance with the bluesign® CRITERIA.



*Input stream management ensures that only ingredients with minimal risks to humans and the environment are used. Pollutants are minimised or eliminated before production has even begun.*

### bluesign® SYSTEM PARTNER and bluesign® PRODUCT

Many world-famous brands have already signed up to the bluesign® system. Their bluesign® SYSTEM-certified textiles demonstrate that they are continuously improving their environmental performance and act responsibly to minimise the impacts on people and the environment. This applies to textile manufacturers as well as chemical suppliers whose components and materials are produced in accordance with the bluesign® CRITERIA.

Consumer products carrying the bluesign® PRODUCT label meet the stringent safety and environmental requirements of the bluesign® SYSTEM. The textiles used in the manufacture of these products must be at least 90 percent bluesign® APPROVED, and accessories such as buttons and zips at least 20 to 30 percent approved.

The image shows a dark blue rectangular label with the word 'bluesign' in white lowercase letters and a registered trademark symbol (®) to its upper right. Below it, the word 'PRODUCT' is written in white uppercase letters.





### GOTS – Global Organic Textile Standard

The GOTS sets out a list of requirements for sustainable textile manufacturing, beginning with the extraction of raw textile fibres, to environmentally friendly and socially responsible manufacturing, to labelling of the finished products. The GOTS is recognised as the world's leading standard for processing textiles from organically produced natural fibres.

Only textile products made from at least 70 percent organic natural fibres are eligible for certification under the GOTS. What is more, all chemical additives, such as dyes and consumables, must meet certain environmental and toxicological criteria. All processing plants must observe the core standards of the International Labour Organisation.

On-site inspections and certification of processing plants, manufacturers and distributors are carried out by independent, specially accredited test institutes based on the GOTS monitoring system.

Textile processing, garment finishing and distribution companies may apply for certification to the Global Organic Textile Standard. The first step is to contact a GOTS-approved certification agency familiar with the GOTS quality assurance system. The quality assurance system stipulates that every stage in the processing and manufacturing chain (from post-harvesting through to sewing, packaging and labelling), as well as all interim distributors, must participate in the inspection and certification programme in order for the finished products to be labelled as GOTS-certified. This ensures credibility and uniformity.

## 6.3 The German Bio-Siegel for organic food

The hexagonal Bio-Siegel label was created in 2001 as a government label for organically produced food. Only producers and manufacturers who comply with the provisions of the EU Regulation on Organic Production and Labelling of Organic Products and participate in the relevant control system are permitted to use this label on their products. The aim is to create market transparency and give guidance to consumers when buying food.





Since 1 July 2010, all packaged organic foods in Europe have been required to display the EU organic 'leaf' logo. Unpackaged organic products originating from or imported into the EU may be voluntarily labelled with the EU organic logo. As both these labels are subject to compliance with the EC Regulation on Organic Production, they are identical in their meaning and represent a minimum standard for organic food. The difference is that the EU logo is a mandatory label which must be displayed on all packaged organic food products, whereas the German Bio-Siegel is voluntary and may be displayed alongside the EU logo.

As well as the government Bio-Siegel, there are various private initiatives which award their own organic farming labels with more stringent criteria than the government scheme. Examples include Bioland, Demeter and Naturland.

*The registration procedure for food products is straight-forward and unbureaucratic. In mid-2017, more than 77,000 products from almost 5,000 companies carried the government Bio-Siegel.*

## 6.4 Marine Stewardship Council

In 1997, the World Wildlife Fund (WWF) and Unilever set up the Marine Stewardship Council (MSC™). The MSC™ aims to safeguard seafood supplies and protect and promote a healthy marine environment, on which the fishing industry relies. This international organisation is now independent from its original founders and recognised as a non-profit organisation. MSC™ develops principles and criteria for assessing sustainable fishing. Any fishery may apply for certification to MSC™ guidelines. The transparent certification procedure is carried out by independent companies.



## 6.5 THE ECO DECLARATION and EPEAT: Certification processes for IT products

### THE ECO DECLARATION

THE ECO DECLARATION (TED) is the most widely used system for environmental information relating to information technology (IT) hardware products. The idea was conceived in Sweden in 1996 and converted into an ECMA standard (ECMA 370) in 2006. The standard is now in its fifth edition, most recently updated in 2019.

#### The aim: Easy to use

The standard is aimed at company-specific and product-specific attributes and does not cover the manufacturing processes and logistical aspects of a product system. It is optimised for use in the European Union but may be used worldwide to meet the needs of business clients and environmentally-minded end customers for product information.



**Figure 11:** IT ECO Declaration form (part 1)

The form for THE ECO DECLARATION contains information on energy consumption, electrical safety, electromagnetic and chemical emissions, the use of flame inhibitors and heavy metals, batteries, disposal options for both the product and its packaging, environmentally conscious product development and so on.



*THE ECO DECLARATION is aligned with public procurement guidelines in EU Member States.*


### Binding nature

THE ECO DECLARATION is based on a form containing detailed, industry-specific questions about the product. Unlike type I labels,

- THE ECO DECLARATION does not compare products; the product information provided is objective and without comment.
- the opportunity of product information is available to all participating companies, rather than singling out the best products.

THE ECO DECLARATION is a binding component of product information for customers. The data sheets are publicly accessible, for example via the Internet.


Figure 12: IT ECO Declaration form (part 2)



## Annex A (Europe) (normative)

### Company environmental profile

This Annex is also provided as a separate file – [ECMA-370-Annex-A.doc](#) – which shall be used for the declarations.



### Company environmental profile - THE ECO DECLARATION

|                               |  |             |
|-------------------------------|--|-------------|
| <b>Brand</b>                  |  | <b>Logo</b> |
| <b>Company name *</b>         |  |             |
| <b>Contact information *</b>  |  |             |
| <b>Internet site *</b>        |  |             |
| <b>Issue date *</b>           |  |             |
| <b>Intended market *</b>      | <input type="checkbox"/> Global <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Asia, Pacific & Japan <input type="checkbox"/> Americas <input type="checkbox"/> Other |             |
| <b>Additional information</b> |  |             |

This is an uncontrolled copy when in printed form. Please refer to the contact information for the latest version. The declaration may be published only when all rows and/or fields marked with an \* are filled-in (n.a. for not applicable). Additional information regarding each item may be found under C7.


| Company environmental profile - Legal requirements |   | Requirement met          |                          |      |
|--|---|--------------------------|--------------------------|------|
| Item   |   | Yes                      | No                       | n.a. |
| <b>C1</b>  | <b>Product recycling</b>  |                          |                          |      |
| C1.1*  | The company participates in a system or has its own system for collection and recycling of end of life products in countries where the company puts them on the market and where required (see legal reference)             | <input type="checkbox"/> | <input type="checkbox"/> |      |
| <b>C2</b>  | <b>Battery recycling</b>  |                          |                          |      |
| C2.1*  | The company participates in a system or has its own system for collection and recycling of batteries in countries where the company puts products on the market (see legal reference) or pays eco tax / fee where required. | <input type="checkbox"/> | <input type="checkbox"/> |      |
| <b>C3</b>  | <b>Packaging recycling</b>  |                          |                          |      |
| C3.1*  | The company participates in a system or has its own system for collection and recycling of packaging material in countries where the company puts products on the market and where required (see legal reference)           | <input type="checkbox"/> | <input type="checkbox"/> |      |

| Company environmental profile - Market requirements |   | Requirement met          |                          |                          |
|---|---|--------------------------|--------------------------|--------------------------|
| Item  |   | Yes                      | No                       | n.a.                     |
| <b>C4</b>   | <b>Environmental policy and environmental management</b>  |                          |                          |                          |
| C4.1*   | The company has a documented environmental policy approved by the management.   | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| C4.2*   | The company has an environmental management system covering:<br>Product development<br>Manufacturing<br>If so, certified according to: <input type="checkbox"/> ISO 14001 <input type="checkbox"/> Other as specified in C7 | <input type="checkbox"/> | <input type="checkbox"/> |                          |
| C4.3  | The company regularly publishes an environmental report.<br>If so, it meets the recommendations of <input type="checkbox"/> The Global Reporting Initiative <input type="checkbox"/> Other as specified in C7               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>C5</b>   | <b>Recycling</b>  |                          |                          |                          |
| C5.1*   | Information about the product, battery & packaging take back system (C1, C2 and C3) is available in printed or electronic format.   | <input type="checkbox"/> | <input type="checkbox"/> |                          |

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Figure 13: IT ECO Declaration form (part 3)



## Annex B1 (Europe) (normative)

### Product environmental attributes - Imaging equipment

This Annex is also provided as a separate file – [ECMA-370-Annex-B1.doc](#) – which shall be used for the declarations.



Annex B1 Product environmental attributes  
**Imaging equipment**

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The declaration may be published only when all rows and/or fields marked with \* are filled-in (n.a. for not applicable). Additional information regarding each item may be found under P15.

|                               |  |             |
|-------------------------------|--|-------------|
| <b>Brand *</b>                |  | <b>Logo</b> |
| <b>Company name *</b>         |  |             |
| <b>Contact information *</b>  |  |             |
| <b>e-mail address</b>         |  |             |
| <b>Internet site *</b>        |  |             |
| <b>Additional information</b> |  |             |

|  |  |
|--|--|
| The company declares (based on product specification or test results based obtained from sample testing), that the product conforms to the statements given in this declaration. |  |
| <b>Type of product *</b>   |  |
| <b>Commercial name *</b>   |  |
| <b>Model number *</b>  |  |
| <b>Issue date *</b>  |  |
| <b>Intended market *</b>   | <input type="checkbox"/> Global <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Asia, Pacific & Japan <input type="checkbox"/> Americas <input type="checkbox"/> Other |
| <b>Additional information</b>  |  |

This is an uncontrolled copy when in printed form. Please refer to the contact information for the latest version.

**About Annex B1**  
 Annex B1 reflects Product environmental attributes relevant for imaging products. The following items from the ECMA-370 Main body are not shown in the template:  
 P9.1 PTEC, ETEC and display resolution  
 P12.1-P12.2 Ergonomic requirements.

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**EPEAT**

Since its launch in July 2006, EPEAT – the Electronic Product Environmental Assessment Tool – has gained widespread recognition for the procurement of IT products and is now used in more than 40 countries.

The classification criteria for product certification were developed and defined in the 1680 family of standards by the IEEE (Institute of Electrical and Electronics Engineers), American National Standard (for computers, monitors, printers, televisions), standard NSF/ANSI 426 (servers) and standard UL 110 (mobile phones). The system is administered by the Green Electronics Council.

Product certification is based on a system which encompasses the entire product lifecycle and includes reducing the amount of toxic materials used in the manufacture of devices, minimising energy consumption during operation, and recyclability. Most of the criteria are binding, while others are optional. On this basis, certified devices are divided into three groups: Gold, silver and bronze. Product registration with EPEAT permits country-specific modifications, allowing it to be used in other countries outside of the United States.

Devices from the following product categories are registered by EPEAT:

- Computers, notebooks, monitors
- Imaging equipment (printers, photocopiers, scanners, fax machines, multi-functional devices)
- Televisions
- Servers
- Mobile telephones



## 6.6 Aiming for energy efficiency

A significant proportion of the electricity consumption in private households and offices is attributable to PCs, fax machines and printers. In 1992, this prompted the American environment agency EPA to devise a voluntary labelling programme known as “Energy Star”, initially with the aim of minimising the energy consumption of equipment in stand-by mode. The emblem shows consumers immediately whether a device ranks among the most energy-efficient on the market. Today, the EPA Energy Star has been extended beyond office equipment to include household appliances. Between 2002 and February 2018, the Energy Star programme was valid for office equipment in the European Union, existing alongside the mandatory EU energy label (see chapter 2.4). The EU Energy Star has since become the principal voluntary labelling programme for IT appliances in Europe. It is currently unclear whether the EU Energy Star will be replaced by an alternative label for IT equipment in future.

## 6.7 Sustainability seal for soaps, detergents and maintenance products



In 2005, the International Association for Soaps, Detergents and Maintenance Products A.I.S.E. introduced the A.I.S.E. Charter for Sustainable Cleaning, with the aim of promoting greater sustainability among these everyday products. This voluntary, European-wide initiative is committed to continually improving the three facets of sustainability: Environmental, social and economic aspects.

Manufacturers and distributors of soaps, detergents and maintenance products throughout Europe may apply to join this initiative. By joining, they undertake to align their production process with the objectives of sustainability, beginning with the procurement of raw materials, spanning in-house manufacturing and packaging, through to the use and disposal of products by consumers.

Participating companies are reviewed by independent auditors and must satisfy criteria in the following core areas:

- Reduce CO<sub>2</sub> emissions, energy and water consumption in production
- Carefully select raw materials and suppliers based on uniform criteria
- Optimise packaging materials
- Protect the health of employees
- Protect the health of consumers and the environment, inter alia by displaying uniform pictograms on packaging for safe, environmentally friendly product use and offering telephone advice to consumers.

Quality management systems such as ISO 9001, ISO 14001/EMAS and BS OHSAS 18001 are recognised for auditing the CHARTER criteria.

Each year, participating companies submit statistics on selected indicators to A.I.S.E. Since 2006, the A.I.S.E. has summarised and published these statistics in an annual sustainability report ([www.aise.eu](http://www.aise.eu)). 2010 saw the introduction of more stringent membership criteria, with a further update planned for 2020. Consumers can identify participating companies from the seals on the packaging.

Since 2020, selected product groups (such as laundry detergents, dishwasher detergents) have been subject to additional product-specific criteria (so-called advanced sustainability profiles ASPs), including the following:

- The environmental safety review must find that there is no risk to the environment, even in a hypothetical scenario where the product in question commands a 100 percent share of the market.
- Products must be marketed in concentrated form and with the minimum possible packaging.
- The packaging must display instructions for washing or cleaning in a resource-conserving manner.

Provided these criteria are met, a product may be labelled with the product-specific seal.

## 6.8 Concrete Sustainability Council

The Concrete Sustainability Council (CSC) is an international organisation initiated by the Cement Sustainability Initiative (CSI) of the World Business Council for Sustainable Development (WBCSD) in collaboration with the cement and concrete industry. The CSC aims to make sustainable practices within the concrete industry more transparent by adopting a certification system.

In developing the CSC system, there was a comprehensive consultation process with the International Union for Conservation of Nature (IUCN) and other social groups in late 2016. The feedback was incorporated into the first market version of the CSC standard, which entered into force early 2017. On 1 January 2019, this version was replaced by the updated version 2.0 following further stakeholder dialogues.

Concrete manufacturers and their supply chain are eligible for certification. The certification logo may be used on products from certified plants.



Company-specific seal



Product-specific seal



The CSC system strives to achieve continual improvements in economic, environmental and social aspects, as well as in other supply chain and management-related criteria. As an incentive, points-based certification is available at multiple levels: Bronze, silver, gold and (in future) platinum. Certain basic requirements must always be met, including traceability of material flows and the observance of valid laws and human rights.

As an added bonus, CSC certification is recognised by international systems for assessing the sustainability of buildings: The CSC certification system is currently recognised by the German Sustainable Building Council (DGNB) and by the BREEAM sustainability assessment system for infrastructure and buildings.

#### Further information

- **A.I.S.E.-Charter for Sustainable Cleaning:** [www.aise.eu](http://www.aise.eu) and <http://de.cleanright.eu>
- **Bio-Siegel:** Informationsstelle Bio-Siegel, Bundesanstalt für Landschaft und Ernährung, Deichmanns Aue 29, 53179 Bonn, Germany, Telephone +49 (0)228 / 68 45 33 55, [www.oekolandbau.de/en/bio-siegel](http://www.oekolandbau.de/en/bio-siegel)
- **Bluesign:** [www.bluesign.com/en](http://www.bluesign.com/en)
- **CSC:** Regional CSC System Operators in Germany: Bundesverband der Deutschen Transportbetonindustrie e. V. (BTB), Telephone +49 (0)30 / 25 92 29 2-0, [www.csc-zertifizierung.de](http://www.csc-zertifizierung.de)
- **Energy Star:** EU-Kommission, DG ENER, DM 24, 04/14, B-1049 Brussels, Belgium, [www.eu-energystar.org](http://www.eu-energystar.org) and [www.energystar.gov](http://www.energystar.gov) (USA)
- **EPEAT:** [www.epeat.net](http://www.epeat.net)
- **FSC/PEFC:** FSC Deutschland, Merzhauser Str. 183, 79100 Freiburg, Germany, Telephone +49 (0)761 / 3 86 53 50, [www.fsc-deutschland.de/de-de](http://www.fsc-deutschland.de/de-de); PEFC Deutschland e.V., Tübinger Straße 15, 70178 Stuttgart, Germany, Telephone +49 (0)711 / 2 48 40 06, [www.pefc.de/](http://www.pefc.de/)
- **GOTS:** [www.global-standard.org](http://www.global-standard.org)
- **MSC:** MSCMSC regional office for Germany/Austria/Switzerland, Schwedter Straße 9a, 10119 Berlin, Germany, Telephone +49 (0)30 / 60 98 55 2-0, [www.msc.org](http://www.msc.org)
- **THE ECO DECLARATION:** [www.ecma-international.org/publications/standards/Ecma-370.htm](http://www.ecma-international.org/publications/standards/Ecma-370.htm)
- **OEKO-TEX® Service GmbH:** Genferstrasse 23, 8002 Zürich, Switzerland, Telephone: +41 44 / 5 01 26 00, [info@oeko-tex.com](mailto:info@oeko-tex.com), [www.oeko-tex.com](http://www.oeko-tex.com)





## VII

# Life cycle assessment and other evaluation methods

- *Life cycle assessments are standardised tools for recording a product's environmental impacts from cradle to grave.*

The results may be incorporated into product-specific environmental information. Standards EN ISO 14040 and EN ISO 14044 provide documented procedures for the drafting and communication of life cycle assessments.

### Life cycle assessments

- Aimed at experts in business, academia and politics, and in some cases the general public
- Provide a comprehensive account of the environmental impacts of a product or service
- Consider the entire lifecycle
- Are the responsibility of the client, practitioner and reviewer
- Comparative life cycle assessments must be reviewed by an independent third party (reviewer)



This was followed more recently by the publication of standards EN ISO 14046 on the water footprint and EN ISO 14067 on the carbon footprint of products, providing standardised process descriptions for assessing selected environmental impacts. They are supplemented by standard EN ISO 14026 on the communication of footprint information.

The Product Environmental Footprint (PEF) developed by the European Commission is a life cycle assessment-based method for quantifying the relevant impact of products and services on the environment. It is based on the 2013 methodological recommendations of the EU Commission and the 2018 guidelines on the development of Product Category Rules.

## 7.1 Life cycle assessment: A differentiated view of products

Life cycle assessments examine a product's environmental impacts throughout its entire life cycle, i.e. from the extraction of raw materials, during production and use, through to recycling. A life cycle assessment elucidates the key environmental impacts and helps to improve a product from an environmental perspective while also ensuring eco-friendly use. It can also serve as the basis for substantiated environmental claims to customers, business partners and stakeholders.

*A life cycle assessment can help when making environmental claims about a product's superiority or equivalence compared to a competitor product with the same intended use.*

**The EN ISO 14000 family of standards is a modular system, with inter-linked rules on environmental management, life cycle assessments and product-related environmental information.**

### Life cycle assessments as a management tool

Life cycle assessments (LCAs) provide companies with extensive data on materials, components, material and energy flows. This information can be incorporated into decision-making processes and used to assist with operational environmental management.

Particularly at the product development stage, life cycle assessments can

- Increase knowledge about a product
- Save costs through
  - More efficient use of materials and energy
  - More efficient production processes
  - Reduced waste generation,
- Trigger innovations,
- Minimise environmental impacts and liability claims.

### Four phases of an LCA

Life cycle assessments may vary in their complexity depending on the intended objective. Standards EN ISO 14040 and EN ISO 14044 define the procedure and the required elements:

1. **Assessment framework**  
clarifies the goal and scope of a life cycle assessment.
2. **Inventory analysis**  
records the material and energy flows at all stages of the life cycle: which raw materials are used and in which amounts, how much energy is consumed, what waste and emissions are generated and so on.
3. **Impact assessment**  
assesses the product's potential impacts on people and the environment, i.e. on air and soil quality, consumption of non-renewable resources and so on. Typical impact categories include global warming potential, acidification potential, eutrophication potential and ozone depletion potential.
4. **Interpretation**  
presents conclusions and makes recommendations.

*Some companies are successively updating the **life cycle assessment data** of their main products. Each new LCA usually requires less work as the amount of data grows.*

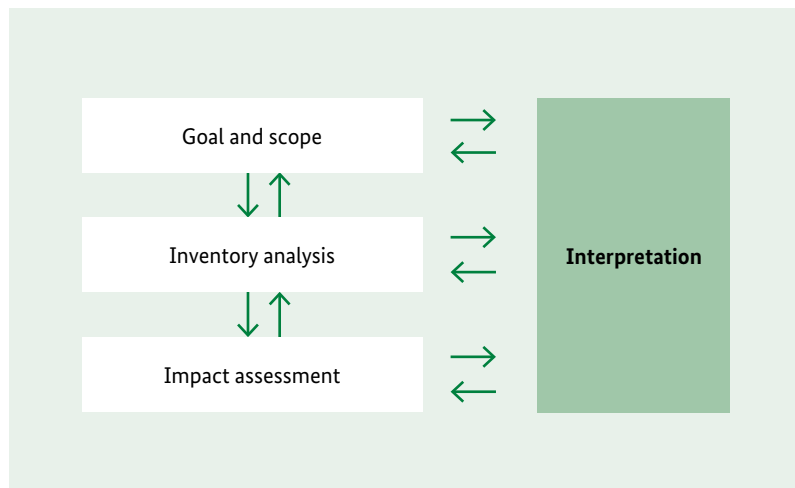
*Life cycle assessment data is already available for countless common materials and energy resources. In particular, there are a number of chargeable databases available, such as ecoinvent, GaBi and Simapro.*

*Some databases are also available free of charge such as ProBas, OpenLCA and ÖKOBAUDAT. The UN initiative Global LCA Data Access Network (GLAD) is committed to improving access to suitable LCA data records. Using existing data can significantly reduce the amount of work required for a life cycle assessment.*



Standards EN ISO 14040 and EN ISO 14044 do not define the scope of a life cycle assessment, but merely support its implementation by stipulating minimum requirements for the procedure and the required components. These minimum requirements apply to all product groups.

**Figure 14:** Phases of a life cycle assessment



#### Transparency in communications

Companies may use selected results from a life cycle assessment as part of their environmental product information. In such cases, the basic requirements governing environmental claims as defined in this brochure apply.

If complete life cycle assessments are published in the form of reports or brochures, for example, standards EN ISO 14040 and EN ISO 14044 stipulate that certain requirements must be observed to ensure transparency and credibility in communications.

#### Publication requirements

- In addition to the results and data, a published life cycle assessment must also outline the methods, basic assumptions and restrictions applied to help readers understand the approach.
- The conclusions presented in the evaluation must be explained, and the information in the life cycle inventory or impact assessment which was used to draw these conclusions must remain visible to readers.
- The publication must clearly reference every subjective evaluation, for example in the form of impact category weightings.
- The standards stipulate that the results of a life cycle assessment should not be summarised in a single numerical value for comparison purposes (environmental claim regarding a product's superiority or equivalence versus a competitor product with the same intended use), because there are no generally recognised scientific methods which would allow this.

- Whenever a life cycle assessment is used as the basis for comparative claims intended for publication, a so-called Critical Review of the LCA by an independent expert is mandatory. This expert opinion must be published as part of the study. The prompt involvement of stakeholders is also recommended.

#### Life cycle assessments – too bulky for communication?

When communicating complex results, it is important to ensure that the content and language used are intelligible to the target audience. For example, the principal findings could be summarized into a shorter document. A life cycle assessment published by OSRAM in 2009 comparing the environmental impacts of filament lamps, compact fluorescent lamps and LED lamps is a pertinent example. For the general public, the life cycle assessment was condensed into an illustrated 26-page report summarising the key technical data and results for the various impact categories analysed. Daimler AG publishes the results of life cycle assessments for its vehicles in an even more abbreviated format, as part of its so-called environmental certificates, in which environmental performance versus predecessor models is depicted in a visual format. Type III environmental product declarations also use LCA results in summarised form, but these tend to be directed at commercial users rather than the general public (see Chapter 5).



*OSRAM's life cycle assessment compared the environmental impacts of filament lamps, compact fluorescent lamps and LED lamps*

## 7.2 Carbon footprint as an indicator of product-related climate action strategies

Experts warn that climate change is one of the most pressing global challenges facing society this century. A radical new approach is needed if we are to succeed in reducing greenhouse gas emissions in the production and consumption of goods and services.

Against this background, the past ten years have seen an intensive debate on how companies and consumers can obtain reliable information about the greenhouse gas emissions associated with products over their life cycle. This information is vital for minimising the climate impacts from the manufacture, use and disposal of products.

From 2007 onwards, the Product Carbon Footprint (PCF) was heavily promoted in various countries including the UK, Japan, South Korea and Thailand as the basis for product labelling. It took the form of a label with a CO<sub>2</sub> number with voluntary testing/trialling of the labels. It soon became clear that harmonised, internationally binding standards and guidelines are urgently needed to define the Product Carbon Footprint methodology.

*Since the Product Carbon Footprint includes both carbon dioxide (CO<sub>2</sub>) emissions as well as all other relevant greenhouse gases with impact-specific weightings, the result is reported as the CO<sub>2</sub> equivalent value (abbreviated: CO<sub>2</sub>(e)).*

After a lengthy discussion process, the ISO 14067 standard was published in mid-2018, setting out the requirements and guidelines for quantifying the carbon footprint of products (PCF). ISO 14067 defines the product carbon footprint as the sum total of greenhouse gases emitted and removed in a product system, expressed as CO<sub>2</sub> equivalents, based on a life cycle assessment for the single impact category of climate change.

**Greenhouse gas emissions are the only life cycle assessment impact category considered by the PCF, and no mention is made of the potential displacement of environmental impacts to other areas. Special consideration should be given to this issue when comparing different product systems (for example, those using different raw materials).**

Determining the Product Carbon Footprint can help companies to:

- Create transparency in the value chain in relation to upstream and downstream processes and other stakeholders,
- Raise awareness of greenhouse gas emissions along the value chain and identify particularly high-emission phases,
- Identify ways of reducing emissions,
- Document PCF improvements, for example over product generations
- Inspire them to develop/improve their own climate strategy.

**Basic principles and key requirements when calculating the Product Carbon Footprint**

The requirements for quantifying and reporting the PCF described in ISO 14067 are based on the life cycle assessment methodology specified in standards EN ISO 14040 and 14044. These principles include:

- Consideration of the entire life cycle,
- Reference to a functional unit,
- An emphasis on a process-oriented, iterative approach when preparing the four phases of the life cycle assessment, and
- Further core requirements such as the priority of scientific findings, together with completeness, consistency, transparency and fairness.

Furthermore, careful consideration of the impact category “greenhouse effect” within the context of the Product Carbon Footprint has revealed that further methodological definitions beyond those in the Life Cycle Assessment are required for in-depth analysis of the climate relevance of selected aspects. Key examples include:



### Fossil and biogenic carbon

In principle, greenhouse gas (GHG) emissions from fossil and biogenic carbon sources must be included (and, where applicable, reduced) when calculating a PCF, but they must be listed separately in the report. Biogenic carbon stored in a product's materials can be calculated and documented in the PCF report, but must not be included in the PCF result itself.

### Treatment of electricity and consideration of specific electricity products

Emissions from the supply of electrical energy are key contributors to the overall GHG emissions of many PCFs. Differentiated requirements therefore apply to the treatment of electricity from different sources such as internally generated electricity, electricity from a directly connected supplier and electricity from the grid. When offsetting green electricity fed into the grid, a sensitivity analysis must be conducted comparing it with the use of the electricity mix from the grid, and if the green electricity was not removed from the supplied mix, this should be documented in the report.

### Land-use changes

Changes in land use, usually for agriculture or forestry, lead to changes in greenhouse gas emissions because the amount of carbon stored in the soil changes. A distinction is made between direct land-use change (dLUC) and indirect land-use change (iLUC). An example of direct land use change would be converting forest land into arable land. Indirect land-use changes may occur, for example, when cultivating energy crops on land previously used for the cultivation of food, animal feed or fibres. It is often the case that new land elsewhere will need to be used to replace “displaced” production (iLUC). The specific circumstances of each individual case must be taken into account in order to obtain reliable values for potential greenhouse gas emissions.

ISO 14067 stipulates that GHG emissions (and removed quantities of GHGs) associated with direct land use changes should be included in the PCF and reported separately; indirect land use changes will be considered at a future date once a suitable procedure has been internationally agreed.





## No consideration of CO<sub>2</sub> compensation measures

Many companies and organisations invest in renewable energy technologies, energy efficiency measures or afforestation projects with a view to partially or fully offsetting the GHG emissions of the products they manufacture. ISO 14067 explicitly excludes the offsetting of such CO<sub>2</sub> compensation measures in the PCF.

### Communication of the Product Carbon Footprint

Generally speaking, the PCF may be cited in communications at every stage of the supply chain – with product manufacturers, retailers and consumers – in order to

- Illustrate the climate relevance of everyday products and services and from this, elucidate the shared responsibility of all stakeholders for climate protection,
- Collaborate with corporate partners in order to reduce emissions in parts of the value chain,
- Inform consumers about alternatives when purchasing and using products and set you apart from the competition, and
- Illustrate your company's social responsibility for climate protection using a specific product as an example.

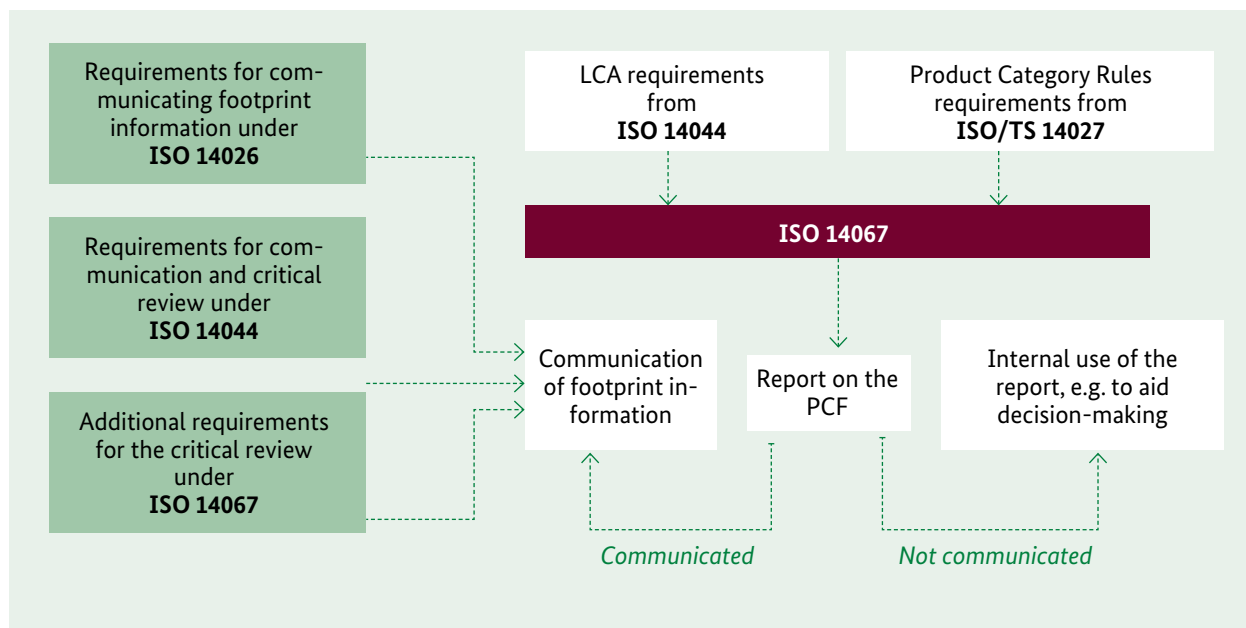
While the international PCF standard explicitly excludes the aspect of communication, standard ISO 14026 outlines the requirements for communicating information about the various types of footprint, including the information content. A footprint communication should therefore include not only the footprint itself (in the case of a PCF, in the form of a CO<sub>2</sub> equivalent value) but also background information. The footprint should include a reference (such as a website link or QR code) for accessing this background information.

Comparative footprint information may also be communicated, provided the same life cycle stages of the relevant products are considered, the same functional unit has been used and calculation follows the same rules.

Graphics can also be used to communicate footprint information and are subject to certain requirements, such as the additional use of words and numbers to provide further information.



**Figure 15:** Relationship between ISO 14067 and other ISO standards, particularly in the communication of results



**Other CO<sub>2</sub> label variants**

Before the PCF standard was devised, there were various product and service labels available offering consumers information about greenhouse gas emissions. Some of them continue to exist alongside the PCF and provide supplementary information in addition to the calculated CO<sub>2</sub> equivalent value.

As illustrated below, there are many different variants of CO<sub>2</sub> labels, particularly best-in-class labels, CO<sub>2</sub>e value labels indicating reduction targets, climate-neutral declarations and Type I ecolabels with the relevant information requirements.



**Table 2:** Design variants of CO<sub>2</sub> labels

| Product label  | Examples   | Type of ecolabel   |
|--|--|--|
| CO <sub>2</sub> label: Indicates that the product is a best-in-class product   | climatop   | Provided appropriate requirements are met, Type II environmental declaration |
| CO <sub>2</sub> label: Specifies a CO <sub>2</sub> e value and planned reduction targets   | Carbon Trust Standard Reducing CO <sub>2</sub>     | Provided appropriate requirements are met, Type II environmental declaration |
| CO <sub>2</sub> label: Climate-neutral label (via compensation measures)   | Carbonfree®, myclimate                             | Provided appropriate requirements are met, Type II environmental declaration |
| Ecolabels which also include climate change mitigation-related criteria in the form of CO <sub>2</sub> e emission limits and other relevant details in the product information | Blue Angel for kiln-dried wood chips/ wood pellets | Type I certified ecolabel  |

### 7.3 Water footprint: An indicator of water protection worldwide

In many parts of the world, water is considered the most precious natural resource and more important than climate. Two-thirds of the world's population live in areas where water is scarce at least one month a year. As well as related environmental problems, water scarcity also poses a threat to human health. Global water consumption levels continue to rise.

In view of this situation, water and water management have played an ever more prominent role in the global sustainability debate in recent years. What is more, the water footprint of food and beverages has been highlighted by the media and attracted keen interest.

The recording and assessment of water consumption in life cycle assessments is still a comparatively new concept, but growing water shortages worldwide, globalised value chains and the more widespread use of life cycle assessments for agricultural products have turned the spotlight on water consumption.

A uniform methodology is needed to calculate and evaluate water use during the production, use and disposal of products. In 2014, ISO 14046 was adopted as the new standard for measuring the water footprint of products, processes and organisations. It is hoped that this standard will ensure the necessary consistency and comparability to create a robust and versatile water footprint.



to ISO 14046

### Water footprint

- Aimed at experts in business, academia and politics
- Based on the basic principles of the LCA
- May also be included as part of a life cycle assessment
- Comprehensively assesses the environmental impacts of water use and water consumption
- May relate to products, services, processes or organisations

### Methodological approach

Analogous to the Product Carbon Footprint (PCF), the ISO 14046 requirements for quantifying and reporting the water footprint of products are based on the life cycle assessment principles and methodology specified in standards EN ISO 14040 and 14044. These include:

- Reference to a functional unit,
- An emphasis on a process-oriented, iterative approach when preparing the four phases of the life cycle assessment, and
- Further core requirements such as the priority of scientific findings, together with completeness, consistency, transparency and fairness.

Unlike the life cycle assessment, the water footprint need not necessarily consider a product's entire life cycle if there are justified reasons for restricting analysis to selected life cycle phases.

Many different environmental aspects are linked to water-related impacts. Unlike the PCF, the water footprint may therefore comprise numerous different impact categories, such as water scarcity, water eutrophication, aquatic ecotoxicity, acidification of water, thermal pollution, or human toxicity from water pollution. The indicators used must be chosen depending on the objective and the analysis framework for the water footprint.

The findings from the different impact indicators may be weighted and combined into a single parameter. If applying a weighting, the implementation and reporting requirements of ISO 14044 must be met.

In the data collection phase, a distinction is made between different water resources, including precipitation, surface water, sea water, brackish



water, groundwater and paleo water. A distinction must also be made between different usage types and geographical usage locations. As well as emissions into water, emissions into air and soil are also taken into account, as these may impact water quality. In the initial phase, different types and qualities of water inputs and outputs at different locations should not be added together. Aggregation is only permitted in the impact assessment phase.

As with the PCF, the offsetting of activities to reduce water-related impacts outside the boundaries of the product system is inadmissible.

#### Applicability of the water footprint and data availability

Precise data is needed to assess the potential impacts on humans and the environment of water use. As well as consumption, many other factors play a vital role, including local water scarcity, socio-economic factors, the origin of the water consumed and the qualitative effects of water use, such as discharge into water bodies.

These requirements make practical determination of the water footprint more difficult. In complex industrial processes, it is tricky to geographically differentiate water consumption because this would necessitate tracking the water used at every stage in the value chain. Where differentiation into different types and qualities of water is required, this will necessitate even more detailed information.

#### Communication of the water footprint

As with the carbon footprint, the overarching requirements of ISO 14026 regarding the communication of footprint information (see above) also apply to the water footprint. Since the water footprint standard was published prior to the general communications standard, it too contains various guidelines on reporting to third parties and statements regarding product comparisons.

If the potential water-related impacts have not been comprehensively investigated, the reporting must make reference to this with a restrictive comment in the footprint title, such as “footprint in relation to water scarcity”.

#### Other approaches for determining water-related footprints

As well as the water footprint pursuant to ISO 14046, various other methods are available for determining the water consumption and water-related environmental impacts of products, organisations and even countries.

The data quality of current life cycle assessment databases is inadequate, making it more difficult to calculate the **water footprint** compared with the **carbon footprint**.



In this regard, a distinction must be made between simple volumetric footprints and impact-based footprints.

The first attempts to determine a product's water consumption over its entire life cycle date back to the early 1960s. Scientists subsequently devised the "virtual water" method, which classifies water into three categories: "Blue water" (groundwater and surface water), "green water" (the portion of precipitation that does not run into surface waters or contribute to groundwater recharge) and "grey water" (water polluted by the discharge of wastewater). The Water Footprint Network was developed based on the virtual water method, which also incorporates spatial and temporal information. This method is simpler than the ISO 14046 water footprint and is often used to calculate the water footprints of countries, for example.

## 7.4 Product environmental footprint: The European approach

In spring 2013, the EU Commission published a communication proposing EU-wide methods for measuring the environmental performance of products (Product Environmental Footprint, PEF) and organisations (Organisational Environmental Footprint, OEF). The Commission encourages Member States and the private sector to use these methods.

This proposal was prompted by recognition of the considerable effort companies needed to invest if they wished to highlight the environmental performance of their products. This entailed choosing from a number of different methods, a financial outlay to prepare the required

information, and in many cases, mistrust among consumers confused by too many different labels and environmental claims making it difficult to compare products.

#### Objective and methodological approach

The PEF is based on an analysis of the entire life cycle of products using a similar methodology to the life cycle assessment. However, the PEF aims to provide a simplified, more standardised method than the comprehensive life cycle assessment. The EU Commission plans to use it in product policy-making and in communications with consumers.

This more standardised approach comprises a defined selection of impact categories and corresponding impact indicators. Above all, it requires the preparation of so-called Product Environmental Footprint Category Rules (PEFCR) in accordance with the Product Category Rules for Type III environmental declarations before drafting the PEF. These product group-specific documents define the rules governing system boundaries, the provision and use of background data, the calculation of environmental impacts and, where appropriate, the collection of additional information to make the results of different PEFs comparable with one another. The existence of an agreed PEFCR therefore considerably reduces the effort required to prepare a PEF.

A test phase from 2013 to 2018 saw the development of product group-specific rules for the PEF with the involvement of various stakeholders. So far, PEFCRs have been completed for 18 product groups – primarily food, but also IT products, paints and leather, for example. Data records containing background information are also available for each product category.

The EU Commission also presented and recommends a proposed system for weighting and summarising the indicator values of various environmental impacts for the PEF. This will also enable comparison with other products of the same category by defining a typical product with average environmental properties (“benchmark”). Where appropriate, comparisons with the benchmark may also be used in communications regarding a product’s environmental performance. However, the technical and political debate on the EU Commission’s proposals has yet to reach a consensus.

#### How the new tool is viewed by different stakeholders

The Commission’s proposal has been criticised by several associations and umbrella organisations. One argument is that a reasonable environmental assessment of products should include a mix of different tools, with due regard for the strengths and weaknesses of each approach.

They also maintain that the quality of the available background data and the calculation methodology are not yet sufficiently well-developed.



Another argument is that the PEF fails to make allowance for fluctuations in upstream chains.

By contrast, several industry players, including the construction sector, have already adopted elements of the PEF as inspiration for the established instrument of EPDs and are considering aligning the indicators and characterisation factors used with the PEF.

The general view among environmental groups is that, while the PEF has the potential to further harmonise the environmental assessment methods for comparable products, it does not (or cannot) take account of major environmental impacts such as the loss of biodiversity, noise pollution or other aspects such as animal welfare. For this reason, they argue, it should never be used as a stand-alone information tool for consumers.

#### Future role of the PEF

The EU Commission is currently in a “transition phase” in which the PEF will undergo further testing. At the end of the transition phase, the Commission will consider applying the PEF to European product policy. What format this might take, and the communication tools it might apply to, has yet to be decided.

#### Further information

- **European Commission, Directorate-General Environment, Product Environmental Footprint (PEF):**  
<http://ec.europa.eu/environment/eussd/smgp/index.htm>
- **European Platform on Life Cycle Assessment, European Commission – DG Joint Research Centre, Institute for Environment and Sustainability**, TP 460, Via E. Fermi 1, I-21027 Ispra (VA), Italy,  
[lca@jrc.ec.europa.eu](mailto:lca@jrc.ec.europa.eu), <http://lca.jrc.ec.europa.eu/>
- **ÖKOBAUDAT - Federal Ministry of the Interior, Building and Community**, Alt-Moabit 140, 10557 Berlin,  
[www.oekobaudat.de/en.html](http://www.oekobaudat.de/en.html)
- **Umweltbundesamt** (German Environment Agency), Division III 2.1 “General Aspects”,  
Wörlitzer Platz 1, 06844 Dessau-Roßlau, Germany, Telephone +49 (0)340 / 21 03-0,  
[www.umweltbundesamt.de/en](http://www.umweltbundesamt.de/en)
- **United Nations Environment, Economy Division**, Life Cycle Initiative, 1 rue Miollis, Building VII – 75015 Paris,  
France, [info@lifecycleinitiative.org](mailto:info@lifecycleinitiative.org), [www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/life-cycle-initiative/global-lca-data-access-network](http://www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/life-cycle-initiative/global-lca-data-access-network)





# The ISO 14000 family of standards

**Table 3:** The EN ISO 14000 family of standards

| Family of standards         | Description   |
|-----------------------------|---|
| <b>EN ISO 14001:2015-11</b> | Environmental management systems – Requirements with guidance for use (ISO 14001:2015); German and English version EN ISO 14001:2015  |
| <b>EN ISO 14004:2016-08</b> | Environmental management systems – General guidelines on implementation (ISO 14004:2016); German and English version EN ISO 14004:2016  |
| <b>ISO 14005:2010-12</b>    | Environmental management systems – Guidelines for the phased implementation of an environmental management system, including the use of environmental performance evaluation              |
| <b>EN ISO 14006:2011-10</b> | Environmental management systems – Guidelines for incorporating ecodesign (ISO 14006:2011); German and English version EN ISO 14006:2011  |
| <b>EN ISO 14015:2010-08</b> | Environmental management – Environmental assessment of sites and organisations (EASO) (ISO 14015:2001); German and English version EN ISO 14015:2010                                      |
| <b>EN ISO 14020:2002-02</b> | Environmental labels and declarations – General principles (ISO 14020:2000); German version EN ISO 14020:2001   |
| <b>EN ISO 14021:2016-07</b> | Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling) (ISO 14021:2016); German and English version EN ISO 14021:2016               |
| <b>EN ISO 14024:2018-06</b> | Environmental labels and declarations – Type I environmental labelling – Principles and procedures (ISO 14024:2018); German version EN ISO 14024:2018                                     |
| <b>EN ISO 14025:2011-10</b> | Environmental labels and declarations – Type III environmental declarations – Principles and procedures (ISO 14025:2006); German and English version EN ISO 14025:2011                    |
| <b>EN ISO 14026:2018-12</b> | Environmental labels and declarations – Principles, requirements and guidelines for communication of footprint information (ISO 14026:2017); German and English version EN ISO 14026:2018 |
| <b>EN ISO 14031:2013-12</b> | Environmental management – Environmental performance evaluation – Guidelines (ISO 14031:2013); German and English version EN ISO 14031:2013   |

**Table 3 continued:** The EN ISO 14000 family of standards

| Family of standards                               | Description   |
|---|---|
| <b>EN ISO 14040:2009-11</b>                       | Environmental management systems – Life cycle assessment – Principles and framework (ISO 14040:2006); German and English version EN ISO 14040:2006                                |
| <b>EN ISO 14044:2018-05</b>                       | Environmental management – Life cycle assessment – Requirements and guidelines (ISO 14044:2006 + Amd 1:2017); German and English version EN ISO 14044:2006 + A1:2018              |
| <b>EN ISO 14045:2012-10</b>                       | Environmental management – Eco-efficiency assessment of product systems – Principles, requirements and guidelines (ISO 14045:2012); German and English version EN ISO 14045:2012  |
| <b>EN ISO 14046:2016-07</b>                       | Environmental management – Water Footprint – Principles, requirements and guidelines (ISO 14046:2014); German and English version EN ISO 14046:2016                               |
| <b>ISO/TR 14047:2012-06</b>                       | Environmental management – Life cycle impact assessment – Illustrative examples on how to apply ISO 14044 to impact assessment situations   |
| <b>ISO/TS 14048:2002-04</b>                       | Environmental management – Life cycle assessment – Data documentation format  |
| <b>ISO/TR 14049:2012-06</b>                       | Environmental management – Life cycle assessment – Illustrative examples on how to apply ISO 14044 to goal and scope definition and inventory analysis                            |
| <b>EN ISO 14050:2010-08</b>                       | Environmental management – Vocabulary (ISO 14050:2009); trilingual version EN ISO 14050:2010  |
| <b>DIN Technical Report<br/>ISO/TR 14062:2003</b> | Environmental management – Integrating environmental aspects into product design and development; German and English version ISO/TR 14062:2002                                    |
| <b>EN ISO 14063:2010-10</b>                       | Environmental management – Environmental communication – Guidelines and examples (ISO 14063:2006); German and English version EN ISO 14063:2010                                   |
| <b>EN ISO 14067:2019-02</b>                       | Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification and communication (ISO 14067:2018); German and English version EN ISO 14067:2018 |

## List of abbreviations

|                 |   |
|-----------------|---|
| A.I.S.E.        | International Association for Soaps, Detergents and Maintenance Products  |
| BMU             | Federal Ministry for the Environment, Nature Conservation and Nuclear Safety  |
| BNB             | Assessment System for Sustainable Building  |
| BREEAM          | Building Research Establishment Environmental Assessment Method, an assessment system for the sustainability of buildings |
| CE              | CE marking = European conformity  |
| CEN             | European Committee for Standardization  |
| CFCs            | Chlorofluorocarbons   |
| CLP             | Classification, Labelling and Packaging of Substances and Mixtures  |
| CO <sub>2</sub> | Carbon dioxide  |
| CPD             | Construction Products Directive   |
| CPR             | EU Construction Products Regulation   |
| CSC             | Concrete Sustainability Council   |
| DGNB            | German Sustainable Building Council   |
| DIN             | German Institute for Standardisation  |
| dLUC            | Direct land-use change  |
| EC              | European Community  |
| EFTA            | European Free Trade Association   |
| EL              | Ecolabel  |
| EN              | European Standard   |
| EPA             | Environmental Protection Agency (US Environmental Protection Agency)  |
| EPD             | Environmental Product Declaration   |
| EPEAT           | Electronic Product Environmental Assessment Tool  |
| eq              | equivalent  |
| EU              | European Union  |
| EUEB            | European Union Eco-labelling Board  |
| e. V.           | eingetragener Verein (Registered association)   |
| FEICA           | Association of the European Adhesive & Sealant Industry FSC Forest Stewardship Council                                    |
| gGmbH           | gemeinnützige GmbH (non-profit limited company)   |
| GHG             | Greenhouse gas  |
| GHS             | Globally Harmonized System of Classification, Labelling and Packaging of Chemicals  |

|                 |   |
|-----------------|---|
| GLAD            | Global LCA Data Access Network  |
| GOTS            | Global Organic Textile Standard   |
| IBU             | Institut Bauen und Umwelt e.V. (Advocate for Sustainable Building)  |
| IEEE            | Institute of Electrical and Electronics Engineers   |
| ISO             | International Organisation for Standardisation  |
| IT              | Information Technology  |
| IUCN            | International Union for Conservation of Nature iLUC Indirect land use change  |
| LG              | Regional Court  |
| LSC             | Lifespan class  |
| LUC             | Land use change   |
| MSC             | Marine Stewardship Council  |
| MSC™            | Marine Stewardship Council (TM = Trademark)   |
| OEF             | Organisational Environmental Footprint  |
| OLG             | Higher Regional Court   |
| PCR             | Product Category Rules  |
| Ref.            | File reference number   |
| PEF             | Product Environmental Footprint   |
| PEFC            | Product Environmental Footprint Categories  |
| PEFCR           | Product Environmental Footprint Category Rules  |
| PEFC™           | Programme for the Endorsement of Forest Certification (TM = Trademark)  |
| PFC             | Product Carbon Footprint (CO <sub>2</sub> footprint)  |
| PLA             | Poly lactide (a biodegradable thermoplastic)  |
| PO <sub>4</sub> | Phosphate   |
| RAL             | Deutsches Institut für Gütesicherung und Kennzeichnung e.V.<br>(German Institute for Quality Assurance and Certification) |
| SVR             | Advisory Board  |
| TED             | The Eco Declaration   |
| UWG             | Act Against Unfair Competition  |
| VCI             | German Chemical Industry Association VOC Volatile organic compounds   |
| WBCSD           | World Business Council for Sustainable Development  |
| WWF             | World Wildlife Fund   |

## List of illustrations

|                   |   |    |
|-------------------|---|----|
| <b>Diagram 1:</b> | Standard-based ecolabels and environmental declarations   | 13 |
| <b>Diagram 2:</b> | Product-related environmental management standards  | 14 |
| <b>Figure 1:</b>  | The product life cycle  | 17 |
| <b>Figure 3:</b>  | Environmental product declaration (EPD) for concrete (part 1) (InformationsZentrum Beton GmbH)  | 43 |
| <b>Figure 4:</b>  | Environmental product declaration (EPD) for concrete; results of the life cycle analysis (part 2)   | 44 |
| <b>Figure 5:</b>  | Product Category Rules (PCR) for mineral insulating materials (Institut Bauen und Umwelt) and an environmental product declaration (EPD) for rockwool insulating materials (Deutsche Rockwool) (Part 1) | 45 |
| <b>Figure 6:</b>  | Declaration for rockwool insulating materials (Deutsche Rockwool); results of the life cycle assessment (part 2)  | 46 |
| <b>Figure 7:</b>  | Product Category Rules (PCR) for architectural metals (Institut Bauen und Umwelt) and EPD for titanium zinc (Rheinzink) (Part 1)  | 47 |
| <b>Figure 8:</b>  | EPD for titanium zinc (Part 2), results of the life cycle assessment (Rheinzink)  | 48 |
| <b>Figure 9:</b>  | From sample EPD to manufacturer-specific environmental declaration  | 49 |
| <b>Figure 10:</b> | Diagram of the textile production chain   | 54 |
| <b>Figure 11:</b> | IT ECO Declaration form (part 1)  | 58 |
| <b>Figure 12:</b> | IT ECO Declaration form (part 2)  | 59 |
| <b>Figure 14:</b> | Phases of a life cycle assessment   | 68 |
| <b>Figure 15:</b> | Relationship between ISO 14067 and other ISO standards, particularly in the communication of results  | 74 |

## List of tables

|                 |   |    |
|-----------------|---|----|
| <b>Table 1:</b> | The ISO 14000 family of standards (excerpt) | 10 |
| <b>Table 2:</b> | Design variants of CO <sub>2</sub> labels   | 75 |
| <b>Table 3:</b> | The EN ISO family of standards              | 82 |

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 Page 59: 2019 Ecma International  
 Page 60: 2019 Ecma International  
 Page 61: Green Electronics Council  
 Page 62: Dmytro Sukharevskiy/StockAdobe.com  
 Page 63, top and bottom: A.I.S.E.  
 Page 64: The Concrete Sustainability Council  
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