DD IEC/PAS 62545:2008

BSI Standards Publication

Environmental Information on Electrical and Electronic Equipment (EIEEE)

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Observations which it is felt should receive attention before the official call for comments will be welcomed. These should be sent to the Secretary of the responsible BSI Technical Committee at British Standards House, 389 Chiswick High Road, London W4 4AL.

The UK participation in its preparation was entrusted to Technical Committee GEL/111, Electrotechnical environment committee.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ELECTROTECHNICAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENVIRONMENTAL INFORMATION ON ELECTRICAL AND ELECTRONIC EQUIPMENT (EIEEE)

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The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
111/86/NP	111/93/RVN

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This PAS shall remain valid for an initial maximum period of 3 years starting from the date of publication. The validity may be extended for a single three-year period, following which it shall be revised to become another type of normative document, or shall be withdrawn.

INTRODUCTION

Global awareness of the urgency of preserving the natural environment has been resulting in the developments of local, national, and/or international regulations on products, a growing consciousness of consumers of products environmental impacts, and generally speaking a growing involvement of every stakeholder in these matters.

This is resulting in an increasing need of exchanges of environmental information between all actors of the product life cycle, from the raw material provider to the recycler, through the manufacturer and the finished product end user. At every stage, needs in terms of content and format of environmental information are different, and possible solutions to fit these needs are multiple. But the key actor of this chain is definitely the producer, who must put on the market products, which:

- are in conformity with the relevant environmental regulations,
- fulfil the technical and environmental requirements/expectations of users.

Every producer is then led to collect the necessary information upstream of the manufacturing stage, and deliver product-related environmental information downstream.

Upstream information is so far being collected by individual producers from their numerous suppliers. This means that every supplier is receiving as many requests as he has customers. Though these requests generally deal with the same items, they are all different and require customized answers.

In the same way, producers have to answer as many questionnaires as they have customers, or to provide consumers with the information they are expecting. This long-standing situation is more and more difficult to manage for companies because of the growing number of questionnaires, most often very different in contents and format, and the increasing number of answers to be provided. It is thus costly and burdensome for:

- every supplier to reply to a lot of different questionnaires,
- every producer to manage a huge quantity of data, and to deliver proper information.

But the main concern about the current situation is that it doesn’t ensure a level playing field on the market. Current rules of play appear insufficient to avoid misunderstanding between stakeholders, mistakes, false claims, which eventually lead to market distortion.

There are therefore clear and urgent needs for standardization to structure and harmonize these exchanges of information.

At that time, many different ways of meeting these needs for providing environmental product information exist. But existing systems all present some deficiencies (see Annex A), that this PAS claims to solve.

ENVIRONMENTAL INFORMATION ON ELECTRICAL AND ELECTRONIC EQUIPMENT (EIEEE)

1 Scope

This PAS provides guidelines on generic environmental attributes to be considered by product committees when preparing a declaration frame suited to a concerned product category to disclose credible, relevant, and harmonized product related environmental information to who needs or requests it. As a result, generic requirements to be followed by upstream suppliers to deliver necessary information to downstream producers are also specified.

This PAS is stand-alone and only applicable if relevant requirements on environmental aspects and impacts information does not exist in relevant product standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC/TR 62139:2004, *Guidelines for the addition of environmental aspects in product standards specific to TC23*

ISO 8601, *Data elements and interchange formats – Information interchange – Representation of dates and times*

ISO 14001:2004, *Environmental management systems ± Requirements with guidance for use*

ISO 14020:2000, *Environmental labels and declarations ± General principles*

ISO 14040:2006, *Environmental management ± Life cycle assessment ± Principles and framework*

ISO 14050:2002, *Environmental management ± Vocabulary*

IEC Guide 109:2003, *Environmental aspects ± Inclusion in electrotechnical product standards*

IEC Guide 114:2005, *Environmentally conscious design - Integrating environmental aspects into product design and development of electrotechnical products*

3 Terms, definitions and abbreviations

For the purposes of this document, the following terms, definitions and abbreviations are used.

NOTE In this PAS, the word “product” can be used in place of, and to mean “product family”, whose products have no significant difference from an environmental point of view.

3.1 Terms and definitions

3.1.1
manufacturer
any person, company or organisation with ultimate responsibility

- to verify compliance with the appropriate standard(s),
- to provide product information

3.1.2
producer
any person who puts electrical and electronic equipment (EEE) on the market, i.e.

- either manufactures and sells EEE under his own trademark,
- or re-sells EEE manufactured by others, under his own trademark,
- or imports or exports EEE

3.1.3
distributor
any person who provides EEE on a commercial basis to the party who is going to use it

3.1.4
end-user
any person who uses an EEE

3.1.5
stakeholder
any person or institution having a stake in the outcome of a situation or decision

NOTE Stakeholders may include: employees, labour unions, government agencies, regulators, non-governmental organizations (NGOs), academic institutions, research groups, customers, suppliers, religious groups, indigenous people, youth, and media.

3.1.6
bill of materials
list of constitutive elements of a product / subassembly / component / material

3.1.7
environmental aspect
element of an organization's activities, products or services that can interact with the environment

NOTE 1 A significant environmental aspect is an environmental aspect that has, or can have, a significant environmental impact.

NOTE 2 For example, energy consumption is, in many cases, the major environmental aspect of electrical or electronic products.

[IEC Guide 109, definition 3.4, as taken from ISO 14001]

3.1.8
environmental impact
change to the environment, whether adverse or beneficial, wholly or partly resulting from an organization's activities, products or services.

NOTE For example, energy consumption of a product has several environmental impacts through the energy production process, such as contributions to the greenhouse effect or to acidification of the environment.

[IEC Guide 109, definition 3.5, as taken from ISO 14001]

3.1.9
life cycle
consecutive and interlinked stages of a product system, from raw material acquisition or generation of natural resources to the final disposal

[IEC Guide 109, definition 3.8, as taken from ISO 14040]

3.1.10
life cycle thinking
LCT
consideration of all relevant environmental aspects (of a product) during the entire (product) life cycle

[IEC Guide 109, definition 3.10]

3.1.11
life cycle approach
LCAp
methodology to take account of all phases of the product life cycle (including manufacturing, distribution, use and disposal) in order to identify its significant environmental aspects and get a true global improvement of environmental performances.

[IEC/TR 62139, definition 3.3, modified]

3.1.12
life cycle assessment
LCA
compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle

[IEC Guide 109, definition 3.9, modified, as taken from ISO 14040]

3.1.13
life cycle inventory analysis
LCI
phase of life cycle assessment involving the compilation and quantification of inputs and outputs for a given product throughout its life cycle

[ISO 14050 – definition 5.3.1]

3.1.14
environmental information on EEE
EIEEE
set of information describing the environmental aspects of the product along its life cycle (material production, manufacturing, distribution, use and end of life)

3.1.15
product environmental profile
PEP
particular form of EIEEE which describes both environmental aspects and environmental impacts of the product along its life cycle (material production, manufacturing, distribution, use and end of life)

3.1.16
eco-solutions
products or services allowing reduction of environmental impacts of a system in which they are a component

NOTE Examples of such eco-solutions are speed-drivers, movement detectors, heating regulators, whose functions can offer significant contributions to reduction of energy consumptions in buildings, plants, etc.

3.1.17
functional unit
quantified performance of a product system for use as a reference unit in a life cycle assessment study

[ISO 14025, definition 3.14]

3.1.18
environmentally homogeneous product category
EHPC
group of products that have equivalent functional unit(s) and equivalent technical option(s) and that present environmental impacts which can be extrapolated from one product to another (e.g. in a linear function of product mass)

NOTE This definition is an adaptation of the definition of “product category” given in ISO 14025, definition 3.12, to address the diversity of EEE.

3.1.19
reference product
representative product of the EHPC used for extrapolating environmental impacts of any product of the EHPC

3.1.20
life cycle impact category indicator
quantifiable representation of an impact category

[ISO 14050, definition 5.3.2.1.1]

NOTE Examples of commonly used indicators are given in Annex A.

3.1.21
hazardous waste
specific waste having a certain level of toxicity and requiring a special treatment

3.1.22
non-hazardous waste
waste without toxicity

3.1.23
waste treatments
operations which aim at reducing the amount of ultimate residues to be disposed of in landfill

NOTE 1 Examples of waste treatments :

a) re-use: waste treatment allowing a part of the used product (part, component or sub-assembly) to be used again either for identical or different function;

b) recycling: waste treatment allowing the waste to be reused either partially or totally in the manufacturing process of either a similar or different product;

c) energy recovery: waste treatment allowing the waste to be transformed to recover a certain amount of energy.

NOTE 2 A typical energy evaluation consists in using thermal energy contained in waste, by burning it and recovering the released energy e.g. for building heating or electricity production.

3.1.24
generic environmental database
LCI data base giving information about commonly accepted results of environmental impact at each step of the life cycle of the product

NOTE See for example the work realized on plastics by the European association Plastics*Europe*.

3.2 Abbreviations

EEE electrical and electronic equipment

EHPC environmentally homogeneous product category

EIEEE environmental information on EEE

LCT life cycle thinking

LCAp life cycle approach

LCA life cycle assessment

LCI life cycle inventory analysis

MD material declaration

PEP product environmental profile

WEEE waste from EEE

4 Methodology and rules to be followed in order to build up environmental information on electrical and electronic equipment (EIEEE)

4.1 General

The EIEEE shall make it possible to exchange reliable information along the supply chain. This may be done by requesting the EEE producer to assess the conformity of their products with the relevant environmental regulations, or to prepare homogenous answers to the increasing and various requests for environmental information from stakeholders.

In this regard, this PAS defines the different attributes which have to be considered by product technical committees when preparing an EIEEE frame. The environmental aspects selected by these committees will take account of the product specificities in terms of market, existing practices and stakeholder expectations.

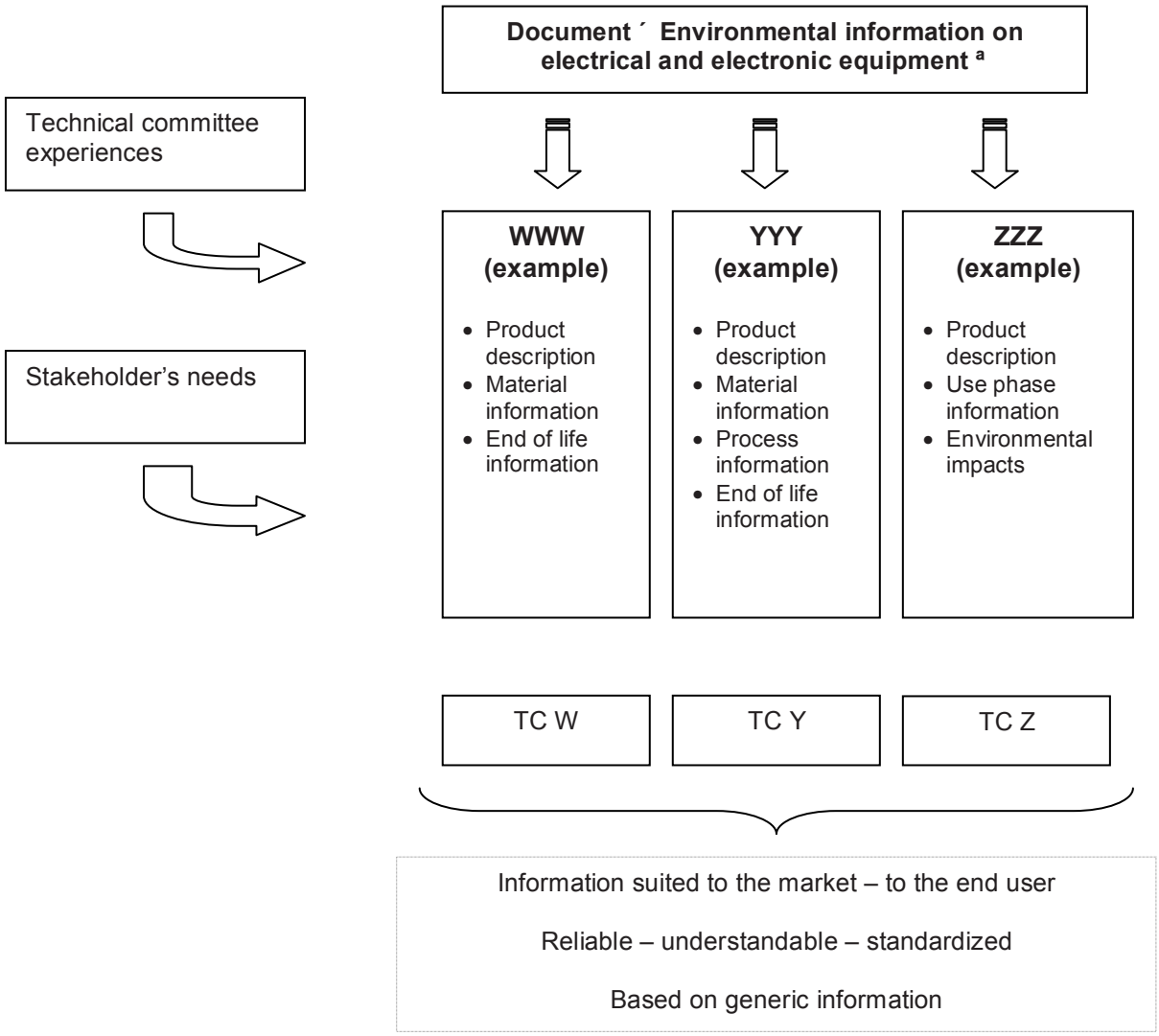

Figure 1 ± General structure of environmental information on electrical and electronic equipment

Information basis: multi-criteria and product life cycle.

As recommended by IEC guides 109 and 114, environmental impacts of a product must be assessed in relation to its whole life cycle, and identification of its significant environmental aspects must be leant on a multi-criteria basis. Limiting assessment to a one or two environmental aspects could indeed be misleading when it has not been preceded by a complete assessment.

NOTE Environmental declarations that focus on the sole material content and/or on the energy consumption of a product during its use phase may hide transfer of pollution from one phase to another, or obscure aspects which are more detrimental to the environment.

EXAMPLE With X-ray medical apparatus, a limited description of materials used in this product would display a high quantity of a hazardous substance: lead. However, obviously, the deletion of this substance in the product would make the apparatus highly noxious and lethal to the regular operators. Another way would be to use alternative expensive materials as a substitute to lead, but this could lead to even worse environmental impacts.

4.2 EIEEE for an environmentally homogeneous product category (EHPC)

In some cases, products of a given category can differ by some aspects which are not environmentally significant or which differ according to well known parameters (e.g. mass of a given component). Product TCs or, failing that, organizations, will then have the opportunity to define an environmentally homogenous product category (EHPC) which can be covered by a single declaration. Such an EIEEE could be used for different products, thus simplifying work and reducing costs.

It is important that such a unique EIEEE does not mislead the customer concering the environmental impacts of any product of the product family, which, for whatever reason, might have different impacts.

Where possible, environmental impacts of a product should be considered according to a standardized use, as defined by the relevant TC.

In addition, they shall have significant common environmental features, such as, for example:

- they are manufactured with the same technologies (same generic materials and same generic industrial manufacturing process);
- and/or they have roughly the same mass and same number of constitutive parts for the same function;
- and/or they have roughly the same power losses and energy consumptions.

EXAMPLE Using the example of switches for household use, one-way, and two-way switches can be considered as members of the same EHPC; however, when combined with a pilot light, they should be considered as belonging to a different EHPC.

Miniature circuit-breakers can be considered to be in the same EHPC if they have the same mass, without needing to consider their ratings.

EIEEE shall make reference:

- either to one product chosen as the most representative in the EHPC, e.g. the most widely sold product;
- or by reference to both bottom-of-the-range and top-of-the-range products.

5 Description of items to be considered when establishing an EIEEE frame

Except when specified as mandatory, the following indications are suggested either for adaptation by each TC to their standards, or for use as guidelines by producers.

A general preliminary statement shall state that the EIEEE is based on this PAS.

5.1 Information about the producer

Name and full address shall be given.

Optionally, the following should be provided :

- phone, fax numbers, E-mail, URL;
- name of persons or departments able to give any additional information;
- information about the environmental management system in place .

5.2 Description of the product

The following elements shall be given:

- product identification: information allowing a full identification of the product: name, range, catalogue number, technical version;

NOTE The exact identification of the product should be considered as a sign of producer responsibility: it should be rigorous, but not over-detailed. All catalogue numbers should be given, if their quantity allows it, or at least, representative catalogue numbers of EHPC.

- product weight and size;
- product function: main utilization function(s) of the product.

Optionally, photography, drawings or any significant picture of the products should be provided

5.3 Environmental aspect identification : reference product and methodology

The basic product(s) subject to the life cycle environmental assessment shall be clearly identified and described.

The methodology used to identify environmental aspects and/or environmental impacts of the product shall be clearly described.

5.4 Constitutive materials

Under consideration – in connection with the work being carried out in TC111/WG1.

5.5 Manufacturing process

A basic description of the main manufacturing steps shall be given.

Optionally, a description of which actions have been realized during the manufacturing process aimed at reducing environmental impacts of the product should be given, e.g.

- indication that the product is manufactured in a plant which is certified to ISO 14001,
- description of the environmental policy at the manufacturing site,
- regulatory survey system.

5.6 Distribution

A basic description of the main packaging and transportation elements shall be given.

Optionally, a description should be given of which actions have been taken in the transport scenarios and which packaging options employed to reduce environmental impact by the product.

It should be described which actions are realized on the packaging process, allowing reduction of environmental impacts of the product, such as, for instance:

- a description of the primary packaging (on the basis of one product only);
- an indication that the packaging is designed according to the current regulations (the applicable regulatory PAS(s) shall be quoted).

5.7 User phase

EEE relies, by definition on electricity, consumption and losses figures for the different relevant phases (e.g. on, stand-by, off mode, etc.). This shall be done in accordance with applicable standards when available. If not available, assumptions and scenarios shall be clearly referenced.

For products which are considered as consuming energy only by loss of power, the consumption values (in W) shall be stated as well as reference to the scenario used to identify these values. Intensity and conductor resistance used for the calculations shall be stated.

Optionally, actions aimed at reducing power needs and related environmental impact of the product should be stated.

5.7.1 Necessary consumables

It shall be stated which consumable parts are expected to be used during the product life, such as, for instance:

- lamps;
- batteries;
- fuses.

5.7.2 Instructions for maintenance

Actions recommended during the product life shall be given, such as, for instance:

- periodic discharge of batteries to reduce ageing.

5.7.3 Special actions to reduce environmental impact

Actions carried out with the aim of reducing environmental impact shall be listed, such as, for instance:

- noise reduction;
- air quality preservation.

5.8 End-of-life

Information or data pertaining to operations to be carried out prior or during the end-of-life treatment shall be provided. Such information shall rely on a standard or internationally acknowledged industry document with reference to actual practice in industrial conditions and related effective needs for information of recyclers for environmental, health or safety purposes. This standard or industry document shall always be quoted.

Optionally, reference to a given recyclability rate should be given. In that case, this shall rely on a standard or internationally acknowledged industry document based on real practices in industrial conditions. When used, this standard or industry referential shall always be quoted.

Information relating to the product on its own shall be clearly separated from those related to its packaging.

5.9 Environmental impacts

Data included in the environmental impacts assessment of the product shall cover:

- packaging;
- secondary components;
- parts;
- consumables;
- instruction notice;

as well as the following phases:

- raw materials;
- manufacturing;
- distribution (carriage + packaging);
- use.

A generic data base shall be preferably used to assess the environmental impacts.

The software used shall be clearly identified (e.g. EIME, Simapro, Gabi, DeamTeam, etc.) inlcuding which version, as well as the database used in relation with this software.

Where available, impact indicators selected by the relevant products TC from the following list, shall be used:

- natural resources depletion (NRD) indicator;
- energy depletion (ED) indicator;
- water depletion (WD) indicator;
- global warming potential (GWP) indicator;
- stratospheric ozone depletion potential (ODP) indicator;
- air toxicity (AT) indicator;
- water toxicity (WT) indicator;
- photochemical ozone creation (POC) indicator;
- air acidification potential (AA) indicator;
- water eutrophication (WE) indicator;
- hazardous waste production (HWP) indicator.

All impact indicators shall be disclosed as numerical values.

It shall be stated which calculations hypotheses have been used:

- “Energy mix” used to determine the environmental impacts shall be identified or/and described for the different life cycle phases. For the use phase, since it cannot be predicted where the product is to be used, several related greenhouse gases emissions figures shall be given (including at least minimum and maximum values derived from typical low and high carbon intensive energy mix).
- The estimated life time used for the determination of the impacts of the product shall be given. When typical standardized figures exist, they shall be given as a priority.

NOTE Estimated life time of the product is different from expected life time of the product and does not imply a minimal durability.

5.10 Eco-solutions

When appropriate, the environmental benefits offered to the whole system by the functions of the product when integrated in this system, should be disclosed and duly assessed and not only the benefits of the product on its own.

NOTE Examples include speed-drivers, movement detectors and heating regulators whose functions can offer significant contributions to reduction of energy consumptions in buildings, plants, etc.

5.11 Date of elaboration of the EIEEE

The date of elaboration of the EIEEE shall be fully and clearly stated as per the extended format given in ISO 8601.

Annex A
(informative)

Life cycle impact category indicators

Annex A gives a list of examples of commonly used life cycle impact category indicators. All indicators are calculated for the whole life cycle of the considered product.

A.1 Natural resources depletion (NRD) indicator

The NRD indicator expresses the depletion of natural resources, taking into account the size of the global reserve (mineral, fossil, etc.) for these resources and the consumption rate of today's economy.

It can be expressed either in the fraction of reserve disappearing per year ($year^{-1}$) or in grams of equivalent antimony (Sb)

A.2 Energy depletion (ED) indicator

The ED indicator expresses the total energy consumption during the whole life cycle of the product.

It is expressed in Joules (J).

A.3 Water depletion (WD) indicator

The WD indicator expresses the total consumption of water during the whole life cycle of the product.

It is expressed in cubic decimetres (dm^3).

A.4 Global warming potential (GWP) indicator

The GWP indicator expresses the contribution to the global warming of the atmosphere by the release of gases during the whole life cycle of the product.

It is expressed in grams of carbon dioxide (CO_2) as if all gases were CO_2, using equivalency in their warming potential.

NOTE 1 Global warming potential is defined by ISO 14064-1, definition 2.18, as a "factor describing the radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time"

NOTE 2 Annex C of ISO 14064-1 contains global warming potentials produced by the Intergovernmental panel on climate change.

NOTE 3 Example of equivalency : 1 g of CH_4 (methane) is equivalent to 21 g of CO_2 (see IPCC Report 2001).

A.5 Stratospheric ozone depletion potential (ODP) indicator

The ODP indicator expresses the contribution to the depletion of the stratospheric ozone layer by the release of specific gases during the whole life cycle of the product.

It is expressed in grams of CFC-11, as if all gases were CFC-11, using equivalency in their depletion potential.

A.6 Air toxicity (AT) indicator

The AT indicator expresses the air toxicity in a human environment, taking into account the usually accepted concentrate tolerated for several gases and the quantity released.

It is expressed as a volume of “bad air”.

A.7 Water toxicity (WT) indicator

The WT indicator expresses the water toxicity taking into account the usually accepted concentrate tolerated for several substances and the quantity released.

It is expressed as a volume of “bad water”.

A.8 Photochemical ozone creation (POC) indicator

The POC indicator expresses the potential creation of tropospheric ozone (“smog”) by the release of specific gases which will become oxidants in the low atmosphere under the action of the solar radiation.

It is expressed in grams of ethylene ($C_2 H_4$), as if all substances were ethylene, using their equivalent potential.

A.9 Air acidification potential (AA) indicator

The AA indicator expresses the air acidification by certain gases released to the atmosphere.

It can be expressed either in grams of ion H^+, as if all gases were H^+, using equivalency in their acidification potential. or in grams of equivalent sulphur dioxide (SO_2).

A.10 Water eutrophication (WE) indicator

The WE indicator expresses the water eutrophication (enrichment in nutritive elements) of lakes and marine waters by the release of specific substances in the effluents.

It is expressed in grams of PO_4^{3-}, as if all substances were PO_4^{3-}, using equivalency in their nitrification potential.

A.11 Waste indicators

The waste indicators can be expressed:

- either as hazardous waste production (HWP) indicator;

The HWP indicator expresses the quantity of hazardous waste produced during the whole life cycle of the product.

It is expressed in kilograms (kg).

- or solid waste production indicator;

  This indicator expresses the quantity of all waste produced during the whole life cycle of the product, with possible discrimination between

  - eliminated waste (hazardous, non hazardous, inert, radioactive),
  - treated waste (by re-use, recycling, or energy recovery – see 3.1.23).

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