Private Circulation

Document: SDS/3/5_18_0060

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Committee Ref: SDS/003/05

Date: 2018/11/07

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Dear Member,

DOCUMENT FOR FINAL VOTE AND APPROVAL TO PUBLISH

DEFAULT UK VOTE: Approval
COMMENTS TO christina.allen@bsigroup.com BEFORE 2018/11/28

Please find attached: FINAL DRAFT FprEN 45559, Methods for providing information relating to material efficiency aspects of energy-related products

This document is circulated to National Committees for approval to progress to publication.

- If the UK votes yes or abstains, it is BSI's policy to implement this document as a British Standard with no further input from the Committee.
- If the UK votes no, we have to provide a technical justification at this stage and this will form the basis of additional information in the National Foreword of any resulting British Standard implementation.
- Additional texts to the National Foreword or National Annex will require endorsement from your Committee Chairman.

Note 1) Only technical comments accompanying a negative vote can be submitted at this stage and they have to be submitted on the correct comment template. If you have any queries on how to use the template then please do not hesitate to contact your Committee Secretary.

Note 2) We are obliged to implement all European Standards and our policy is to implement as full a package of International Standards as possible.

Note 3) If you do not consider an International Standard suitable as a British Standard please discuss with your Committee Secretary.

Please notify your Committee Secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard:

i) has any issues related to 3rd party IPR, patent or copyright,
ii) affects other national standard(s),
iii) requires additional national guidance or information.

If we do not hear from you by the above date we shall submit a vote of approval to CEN on behalf of the UK committee.

Yours sincerely

Christina Allen
Secretary to SDS/003/05

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

FINAL DRAFT
FprEN 45559

November 2018

ICS 13.020.30; 29.020; 31.020

English Version

Methods for providing information relating to material efficiency aspects of energy-related products

Méthode de communication des informations sur l'utilisation rationnelle des matériaux dans les produits liés à l'énergie

Verfahren zur Bereitstellung von Informationen über Materialeffizienzaspekte energieverbrauchsrelevanter Produkte

This draft European Standard is submitted to CENELEC members for formal vote. Deadline for CENELEC: 2018-12-28.

It has been drawn up by the Technical Committee CEN/CLC/JTC 10. If this draft becomes a European Standard, CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN and CENELEC in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document [FprEN 45559:2018] has been prepared by CEN/CLC/JTC 10 “Energy-related Products - Material Efficiency Aspects for Ecodesign”.

This document is currently submitted to Formal Vote.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dor + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dor + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

This document has been prepared under a standardization request given to CEN and CENELEC by the European Commission and the European Free Trade Association.

The dual logo CEN-CENELEC standardization deliverables, in the numerical range of 45550 – 45559, have been developed under standardization request M/543 of the European Commission and are intended to potentially apply to any product within the scope of the Directive 2009/125/EC concerning energy-related products (ErP).

Topics covered in the above standardization request are linked to the following material efficiency aspects:

a) Extending product lifetime;

b) Ability to reuse components or recycle materials from products at end-of-life;

c) Use of reused components and/or recycled materials in products.

These standards are general in nature and describe or define fundamental principles, concepts, terminology or technical characteristics. They can be cited together with other product publications, e.g. developed by product technical committees.

This document is intended to be used by technical committees when producing horizontal, generic, and product-specific, or product-group, publications.

Introduction

This document aims to set up a general method for the communication of material efficiency (ME) aspects of energy-related products (ErP). It is intended to be used as input for the development of a communication strategy in horizontal, generic, product-specific, or product-group publications.

This document relates to the standards in the range of “EN 45552 – 45558” developed under the standardization request M/543 [1]. While the other standards will provide methods to assess or measure specific ME topics, this document focuses on the communication of the various topic-related content.

Legislation can require that ME information is provided to specific intended audience and is verifiable, accurate, relevant and not misleading. Therefore, this document requests that the intended audiences (end-users, professionals or market surveillance authorities) are taken into account as well as the means of communication and media for providing the ME information.

1 Scope

This document establishes a common method for the provision of information related to the material efficiency (ME) aspects of ErP. It has two key intentions:

- it requires generic or horizontal ME topic publications to include a clause with an overview of the specific topic-related content to be reported; and
- it includes a generic method on how to create a communication strategy which will be used when preparing product-specific, or product-group, publications.

NOTE Through-out this document, the term “product” refers to “a specific product or a group of products”.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

There are no terms and definitions listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

NOTE See CEN-CLC TR 45550 [2] for definitions related to ME of ErP.

4 Method for providing information on ME

4.1 General

When planning the delivery of information on ME topics, added clarity and consistency can be gained by breaking down that information, namely:

- The specific ME topic and the related content;
- The target audiences that are likely to receive the information and the corresponding data sensitivity levels;
- The means of communication and media best suited to deliver the information.

This concept is depicted in Figure 1. The annexes provide additional or complementary information, as follows:

- Annex A provides an example of a ME communication matrix for a specific product;
- Annex B provides considerations relating to the use of asset tracking technologies for communication purposes, for example by providing a means of linking from a sticker on a product to online product information (e.g. RFID);
- Annex C provides an example of how ME information could be reported by product publications.

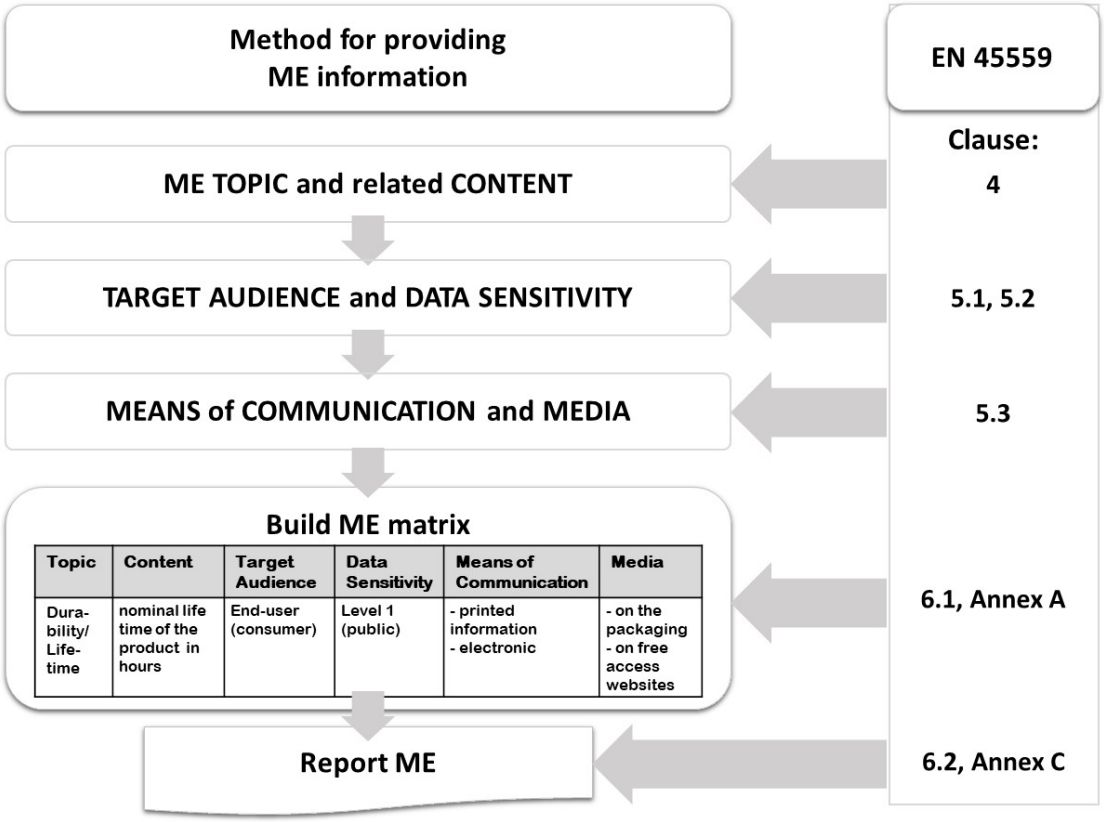

Figure 1 — Graphical representation of the method

NOTE An example of durability/lifetime requirements for certain lamps according to EU/1194/2012; Annex 3.1.2 [3] is shown in the figure.

4.2 ME topics and content

4.2.1 ME topics

ME topics as proposed by standardization request M/543 [1] have been consolidated by the CEN-CENELEC standards in the numerical range of EN 45552 – 45558.

With respect to the delivery of information, product publications shall determine which of the different ME topics are relevant or applicable to that product and the metrics associated to it, as below.

- **Durability:** EN 45552, *General method for the assessment of the durability of energy-related products* [4]*;*
- **Ability to remanufacture:** EN 45553, *General method for the assessment of the ability to remanufacture energy-related products* [5]*;*
- **Ability to repair, reuse and upgrade:** EN 45554, *General methods for the assessment of the ability to repair, reuse and upgrade energy-related products* [6]*;*

- **Recyclability and recoverability:** EN 45555, *General methods for assessing the recyclability and recoverability of energy-related products* [7]*;*

- **Proportion of reused components:** EN 45556, *General method for assessing the proportion of reused components in energy-related products* [8]*;*

- **Proportion of recycled content:** EN 45557, *General method for assessing the proportion of recycled content in energy-related products* [9]*;*

- **Use of critical raw materials:** EN 45558, *General method to declare the use of critical raw materials in energy-related products* [10].

4.2.2 Topic-related content

The assessment of ME topics such as the ones listed in 4.2.1 is likely to generate different types of information to be communicated to one of more target audiences, either on a voluntary basis or to fulfil legislation. These will be referred to as “topic-related content” in this document.

Topic-related content can have a qualitative nature (like repair information, test reports, etc.) or quantitative (%, mass, hours, etc.).

In some cases, the topic-related content can also be used as an input to assess a ME topic. For example, in order to assess the reparability of a product as described in EN 45554 [6], the availability of specific information by some target audiences, such as information on the availability of spare parts or disassembly instructions, may be needed.

EXAMPLE Examples of topic-related content are:

- Lifetime of a product or product part in appropriate unit of time, cycles, or distance;
- Repair instructions;
- Information on repair centres;
- Disassembly instructions;
- Information on the transfer and deletion of personal data from a product;
- Information on upgrade potential of certain product parts;
- Upgrade instructions;
- Time for disassembly (in appropriate time unit);
- Disassembly sequence (qualitative assessment);
- Availability of spare parts;
- Information on the presence of critical or hazardous materials (in support of e.g. recycling);
- Content of reused components in mass% or total number%;
- Ability to remanufacture a product (qualitative assessment);
- Recycled content in mass%;
- Recyclability or recoverability rates in mass%;
- Amount of CRM, in mass or mass% or range or other;

- The location of one or more CRMs in a product or product part.

NOTE The above is a non-exhaustive list. Also, not all content will be applicable to all products.

4.2.3 Documenting topic-related content

Standardization documents involving ME topics, including the ones listed in Clause 4.2.1, shall include a clause with an overview of the specific topic-related content to be reported. Where needed, they will also include an overview of information necessary as input for the assessment of that specific ME topic.

5 Communication strategy

5.1 Target audience

When planning provision of ME information, the needs and capabilities of the intended target audience(s) shall be addressed. Consideration shall be given by the product publications how the target audience are likely to use or manage the product (including end-of-life). Matters such as age range, language, technical knowledge, and technical discipline shall also be taken into account.

The target audience(s) shall be defined and specified when determining the ME information to be provided. The ME information is likely to be directed at more than one target audience (for example consumers and individuals responsible for installation, repair, or certain types of maintenance) and it shall be separated into relevant sections that are clearly and appropriately indicated per target audience.

Three key target audience(s) are defined in this document, representing the numerous receivers of ME information. Product publications shall take into account all three groups when developing the strategy for ME information provision:

- End-users (including consumers);
- Professionals;
- Market surveillance authorities.

NOTE 1 End-users can also be business organizations using the product.

NOTE 2 Professionals include but are not limited to installers, repairers, (re-)manufacturers, maintenance operators, upgrade services, treatment and preparing for reuse operators, and retailers.

5.2 Data sensitivity

5.2.1 General

The ME information to be communicated can be classified as confidential, restricted or public [11]. Disclosure, alteration or loss of, for instance, confidential data, could cause damage to the manufacturer, its affiliates, and/or third parties.

Therefore, the provision of data considered as confidential by the manufacturer is at the discretion of the manufacturer, except when mandated by legislation or by voluntary agreements signed by the manufacturer.

The purpose of establishing different data sensitivity levels for ME topics is to create a communication strategy for topic-related content based on its level of sensitivity for the manufacturer and relevance for the target audience. Topic-related content can be shared according to three levels, depending on the type and sensitivity of the information with the receiver (target audience) in mind.

The level will depend on, among other aspects, product type, market needs, regulations and sensitivity of the data including for example product safety aspects. See Annex A for an example of the use of data sensitivity levels associated with different topic-related content.

5.2.2 Level 1 – PUBLIC

The topic-related content is classified as PUBLIC when the disclosure, alteration or loss of that content would result in little or no damage to the manufacturer and its affiliates, to third parties or customers. Public content also refers to data that shall be disclosed in view of legislation or to comply with a voluntary agreement.

5.2.3 Level 2 – RESTRICTED

The topic-related content is classified as RESTRICTED when the disclosure, alteration or loss of that content could result in moderate damage to the manufacturer or its affiliates, as well as risks to third parties. Restricted information can be shared by the manufacturer with authorized third parties.

5.2.4 Level 3 – CONFIDENTIAL

The topic-related content is classified as CONFIDENTIAL when the disclosure, alteration or loss of that content could cause significant damage to the manufacturer or its affiliates, as well as risks to third parties. Confidential data are highly sensitive or valuable information, both proprietary and/or private. The highest level of security controls should be applied to confidential data.

5.3 Communication method

5.3.1 General

In this document “means of communication” and “media” are defined as the basis of the communication method. Means of communication refers to the way in which ideas or information are communicated, either oral, written, graphics or combinations thereof. Media refers to the collective communication outlets or tools used to store or deliver information or data. Means of communication and media shall be chosen as appropriate according to the environment and target audience.

The decision of which media to use shall ensure that the target audience can have permanent and / or easy access to all information necessary during use and / or management of the product, under foreseeable circumstances, especially for safety, installation, maintenance, repair, and disposal.

The means of communication and media shall be chosen taking compliance with legal requirements into consideration.

NOTE The terms means of communication and media are derived from EN IEC 82079-1:2012 [12].

5.3.2 Means of communication

After defining the content in relation to the ME topic to be communicated and to whom, users of this standard shall consider the means of communication that are most suitable for providing that information. Examples of means of communicating ME topics are:

- **Oral formats:** such as audio and video, recorded media, mouth-to-mouth communication, phone, etc.;
- **Written formats:** such as text, labels, illustrations, leaflets (e.g. paper, plastic), posters, data-sheets, brochures, press, product built-in manuals, letters, emails, technical documentation;
- **Graphic representation:** such as graphical symbols, marks, photographs, braille, tactile figures, signs or other visible hand gestures;
- **Combinations of the above:** such as electronic information, virtual-reality, asset tracking technologies (e.g. barcode, QR code), etc.

More details on asset tracking technologies as means of communication are provided in Annex B.

5.3.3 Media

Depending on the type and amount of information, its duration of availability and the target audience of the information, different media can be suited for its storage and / or provision. For example, if the information is intended to support the consumer in a purchase decision, it should be made available where end-users collect information on the product, such as the manufacturer's websites, sellers' websites, or at the point of sale, nearby the exhibited product. Maintenance or repair information for end-users could be made available on designated websites or with the product documentation, while for professionals, it could be provided through databases or websites. The time of availability of information on websites should also take into consideration the period for which the product can be expected to be in use after the last production.

Suitable media to store or provide ME information can be for instance:

- **In/on the product or product packaging;** e.g. booklets and manuals with text and illustrations, permanent marking or peel-able tags;

- **Websites and databases of manufacturer and other relevant organizations**; e.g. text or video (including auxiliary means such as audio and subtitles), animated illustrations and 3D-models controllable by the user, printable versions of documents, etc.;

- **At the point of sale;** e.g. folders and leaflets (e.g. paper, plastic), photographs, graphical symbols and illustrations, braille, tactile figures, signs or other visible hand gestures;

- **Other (mass) media:** TV, radio, internet, telephone, etc.;

- **Special technologies:** radio-frequency, infrared, wireless and other technologies used in tracking assets, such as RFID, QR-codes, etc.

5.3.4 Considerations on the communication methods per target audience

5.3.4.1 Analysis of the target audience and their needs

Consideration of the needs of the target audience as set out in 5.1 shall take place. Where products or the information on the ME topic are intended to be used by a target audience with particular requirements, the means of communication chosen will take these into account. For example:

- For **end-users**, the ME information to be provided shall be simple, clear and intuitive, easily accessed, visible and readable, and shall be provided in the official languages where the product is sold. Where possible, symbols may replace or support the use of long or complex texts. The communication method should be assessed (if possible) prior to applying it to end-users, and the findings of any existing studies in this area taken into account. For more information see EN IEC 82079-1:2012, Annex E [12];

- ME information to be used by **professionals**, though more technical in character, still needs to be well structured, easy to read/understand, and the media chosen should reflect ease of access and updating;

- The ME information for the **market surveillance authorities** will be laid down in legislation and can be combined with product registry databases. For surveillance purposes, the data shall be clear and complete, with the archiving period and response time in compliance with the requirements laid out in the relevant legislation.

In cases where the information is expected to be used by a target audience with particular needs, for example elderly people or children, individuals with visual or hearing impairment, or persons who are functionally illiterate, the provision of information should also take them into account. For more information, see ISO IEC Guide 71 [13].

5.3.4.2 Understandable terminology and supplementary information

The information on ME topics shall be communicated in a way that allows it to be understood by the target audience. The use of technical terms and expressions shall be explained. The meaning of symbols or labels shall be explained so that they can be easily recognized and understood by the target audience.

Where supplementary information on ME topics is provided (e.g. built-in manuals, recorded media, and additional data in websites), either for a particular target audience or for a specific purpose, its availability shall be clearly indicated on the instructions for use of the product (EN IEC 82079-1:2012) [13].

5.3.4.3 Typical media per target audience

- **End-users:** product documentation including instructions for use, leaflets and brochures, marking on the product or packaging (signs, labels, QR code, etc.), manufacturer public website, etc.;
- **Professionals:** product documentation, manuals, public or restricted databases and websites, marking on products or their components, assessment and other technical documentation, etc.;
- **Market surveillance authorities:** letters, email correspondence, restricted product-registry databases, assessment and other technical documentation, etc.

5.3.5 Considerations and limitations of the communication methods

The exact means of communication and media that will be chosen to provide information on a specific ME topic will depend on a variety of considerations such as type, format and size of product, amount of information to be provided, target audience, and the application of the product, etc. These should be carefully evaluated when deciding on a specific communication method. Some considerations and limitations of the various means of providing information are:

- Volume of data to be communicated;
- Processing speed required;
- The need to link to online content;
- Necessity to be read by humans and/or machines;
- Necessity to read with commonly available tools (e.g. barcode reader or mobile phone camera);
- Necessity to create with commonly available tools;
- Limitations on size;
- Suitability for certain 3D forms e.g. cylindrical objects;
- Necessity to read in different orientations;
- Durability of the marking;
- Environmental impacts of the solution;
- Cost limitations (per unit marked).

6 Provision of ME information

6.1 Building a ME communication matrix

Once the many different aspects given in Clauses 4 and 5 relevant for creating a ME communication strategy are available, they can be used to populate an ME communication matrix as given in Table 1. The purpose of this matrix is to support product publications in gathering all relevant topics in a uniform and structured way, taking into consideration not only the topic-related content, but also data sensitivity, target audience and the communication method.

Possible inputs to the ME communication matrix as discussed in Clauses 4 and 5 are summarized in Table 1:

Table 1 — Typical inputs to the ME communication matrix

Topic	Content	Target Audience	Data Sensitivity	Means of Communication	Media
— Durability / lifetime — Reparability — Upgradability — Product reuse — Ability to remanufacture — Recyclability — Recycled content — Use of reused components — Use of CRMs	— Technical documentation — Repair manual — Instructions on how to disassemble products to access specific parts — Location and quantity of CRMs or toxic substances — Information on disassembly in support of repair — Recycling information — Etc.	— End-users — Professionals — Market surveillance authorities	— Level 1 (public) — Level 2 (restricted) — Level 3 (confidential)	— Oral formats — Written formats — Graphical representation — Combination of the above (e.g. electronic)	— Manufacturer archives — Manufacturer / Retailer website — Contact via phone — At point of sale (leaflet, folder) — On/In package (e.g. label) — On/In product (e.g. mark)

When preparing the ME communication matrix the template provided in Table 2 shall be completed. An example of a matrix based on currently regulated ME requirements for vacuum cleaners is shown in Annex A.

Table 2 — Template for creation of ME communication matrix

Topic	Content	Target Audience	Data Sensitivity	Means of Communication	Media

6.2 Reporting ME

Based on the content specified by each ME standard of the range EN 45552 - EN 45558, product publications shall further detail the applicable ME topics and the related content.

To support the creation of a report, an example reporting template is provided in Annex C of this document.

6.3 Considerations on the communication of aggregated ME topics

Information about ME topics such as those referred to in 4.2.1, may be communicated individually or in aggregated form. The methods applied to aggregate such ME topics shall be documented and communicated, along with explanation of what is included or omitted, and how the aggregation has taken place.

When communicated in an aggregated form, the information on the individual ME topic shall also be documented and should be reported, as necessary.

Annex A
(informative)

Example of a ME communication matrix for a product

A.1 General

The objective of this annex is to outline existing regulatory requirements and show how they map the ME communication matrix, in addition to the example of a one-line communication matrix for lamps shown in Figure 1 (Clause 4.1). Here, an example of regulation containing ME requirements for vacuum cleaners, EU Regulation No. 666/2013 [14], is presented. The requirements under the WEEE Directive (2012/19/EU) [15] referring to end-of-life management of electrical and electronic products is included to complement the example.

A.2 Example of regulated requirements and communication of ME information

A.2.1 Product requirements

The relevant legal requirements as stated in EU Regulation No. 666/2013 [14] are:

"the hose, if any, shall be durable so that it is still useable after 40 000 oscillations under strain";

And:

"operational motor lifetime shall be greater than or equal to 500 hours".

A.2.2 Information to be provided by manufacturers

The relevant legal requirements as stated in EU Regulation No 666/2013 [14] are:

"The technical documentation, booklet of instructions and free access websites of manufacturers, their authorised representatives, or importers shall contain the following elements:

— short title or reference to the measurement and calculation methods used to establish compliance with the above requirements";

And:

"The technical documentation and a part for professionals of the free access websites of manufacturers, their authorised representatives, or importers shall contain the following elements:

— information relevant for non-destructive disassembly for maintenance purposes, in particular in relation to the hose, suction inlet, motor, casing and cable".

A.2.3 Information related to end-of-life management

The relevant legal requirements on end-of-life management as stated in EU Regulation No 666/2013 [14] are:

"The technical documentation and a part for professionals of the free access websites of manufacturers, their authorised representatives, or importers shall contain the following elements:

— information relevant for dismantling, in particular in relation to the motor and any batteries, recycling, recovery and disposal at end-of-life".

Legal requirements, stated in Article 15 of the WEEE Directive (2012/19/EU) [15] for producers of EEE referring end-of-life management are:

"…This information shall identify, as far as it is needed by centres which prepare for re-use and treatment and recycling facilities in order to comply with the provisions of this Directive, the different EEE components and materials, as well as the location of dangerous substances and mixtures in EEE. It shall be made available to centres which prepare for re-use and treatment and recycling facilities by producers of EEE in the form of manuals or by means of electronic media (e.g. CD-ROM, online services)…".

355 Table A.1 exemplifies the application of the proposed ME communication matrix detailed in Clause 6.1. The
356 table organizes the legislative requirements detailed in A.2 within the format of the communication matrix.

357 **Table A.1 — ME communication matrix for a vacuum cleaner**

Topic	Content	Data Sensitivity	Target Audience	Means of Communication	Media
Product durability/ lifetime	Assessment of the durability of the hose and lifetime of the motor	Level 3 (confidential)	Market surveillance authorities	Written (technical documentation)	Manufacturer archives
Product durability/ lifetime	Title or reference to the assessment of the durability of the hose and lifetime of the motor	Level 3 (confidential)	Market surveillance authorities	Written (technical documentation)	Manufacturer archives
		Level 1 (public)	End-Users	— Written (product manual) — Electronic	— In the package — Manufacturer free access website
Ability to repair, reuse, and upgrade	Non-destructive disassembly for maintenance purposes, especially hose, suction inlet, motor, casing and cable	Level 3 (confidential)	Market surveillance authorities	Written (technical documentation)	Manufacturer archives
		Level 2 (restricted)	Professionals	Electronic	A part for professionals of the free access website
Ability to repair, reuse, upgrade	Information relevant for dismantling, in particular in relation to the motor and any batteries	Level 3 (confidential)	Market surveillance authorities	Written (technical documentation)	Manufacturer archives
		Level 2 (restricted)	Professionals	Electronic	A part for professionals of the free access website
Recyclability and recoverability	Information relevant for recycling and recovery	Level 3 (confidential)	Market surveillance authorities	Written (technical documentation)	Manufacturer archives
		Level 2 (restricted)	Professionals	Electronic	A part for professionals of the free access website
End-of-life management	Information relevant for disposal at end-of-life	Level 1 (public)	End-Users	— Written: product manual — Graphical representation: Mark (e.g. crossed bin)	— In the package — On the package or Manual
	Information on the EEE components and materials, as well as the location of dangerous substances and mixtures in EEE	Level 2 (restricted)	Professionals	— Written: manuals — Electronic: Mark (CD-ROM, online services)	— Mail delivery — A part for professionals of the free access website
NOTE This table is intended for illustrative purpose only. Product publications will contain similar tables reflecting the ME topics and related content to be communicated.					

Annex B
(informative)

The use of asset tracking technologies as means of communication

B.1 Types of asset tracking technologies

B.1.1 General

There are a number of technological solutions available that enable the tracking of assets and communication of large amount of data. For the purpose of Ecodesign, such solutions can be useful for tracking e.g. key components or materials, for providing a means of linking to online end-of-life product information such as recycling aspects, or for communicating information to a consumer.

Explanation of the most common currently used technologies are provided below.

NOTE this list is not intended to be comprehensive as new technological solutions are likely to become available in the future as technology evolves.

B.1.2 Barcode

A barcode is an optical machine-readable representation of data. It is a code in the form of numbers and a (one-dimensional) pattern of parallel lines of varying widths and spacings that is designed to be scanned by an imaging device so that the data can be accessed.

EXAMPLE A barcode could be applied to a part in order to enable repairers to scan the barcode and obtain the spare part reference number or code.

B.1.3 QR code

Abbreviated from quick response code. This is a type of matrix or two-dimensional barcode consisting of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera. The data (or web link) is then extracted from the patterns that are present in both the horizontal and vertical components of the image.

QR codes have a greater storage capacity than standard barcodes. Different types of QR codes exist including smaller micro QR codes and more data dense coloured QR codes (HCC2D). Some QR code solutions require a license, and some are not suitable for curved surfaces. They can usually be read in different orientations.

EXAMPLE A QR code could be applied to a product or part to enable end-users to scan the code and link to online information on repair.

B.1.4 RFID

Abbreviated from radio-frequency identification device. This technology uses electromagnetic fields to automatically identify and track tags containing electronically stored information attached to objects. The tag has a small antenna which emits a radio frequency signal that is picked up and read by a wireless RFID reader. RFID is especially useful in situations where large quantities of goods are moved or tracked (without the need for individual scanning or orientation of the goods). RFID tags are either active or passive:

- Active RFID tags contain their own power source giving them the ability to broadcast with a read range of up to 100 m. Their long range readability makes active RFID tags ideal for many industries where asset location and other improvements in logistics are important.

- Passive RFID tags do not have their own power source. Instead, they are powered by the electromagnetic energy transmitted from the RFID reader. Because the radio waves need to be strong enough to power the tags, passive RFID tags have a read range from near contact and up to 25 m.

RFID Tags vary greatly in size, shape and capabilities. The active RFID tag has its own battery, continuously broadcasting its signal with a much broader (up to a mile) working range and because of this it is much larger than a normal RFID tag.

EXAMPLE An RFID tag could be applied to highly reusable parts so that treatment facilities can automatically identify these when waste electronic and electrical equipment is delivered to them.

B.1.5 NFC

Near Field Communication (NFC) is a short-range wireless connectivity standard (Ecma-340, ISO/IEC 18092) that uses magnetic field induction to enable communication between devices when they're touched together, or brought within a few centimetres of each other. NFC is a specialized subset within the family of RFID technology. Specifically, NFC is a branch of High-Frequency (HF) RFID, and both operate at the 13,56 MHz frequency.

NFC is designed to be a secure form of data exchange, and an NFC device is capable of being both an NFC reader and an NFC tag. This unique feature allows NFC devices to communicate peer-to-peer. There are standards specifying a way for the devices to establish a peer-to-peer (P2P) network to exchange data. After the P2P network has been configured, another wireless communication technology, such as Bluetooth or Wi-Fi, can be used for longer range communication or for transferring larger amounts of data.

EXAMPLE NFC could be used to establish data transfer between appliances and subsequent data deletion to facilitate reuse; or to send a query to a product to ask if it has specific spare parts with the necessary remaining lifetime to enable them to be reused in another product.

B.2 Applicability of asset tracking technologies as means of communication

Table B.1 shows the different asset tracking technologies and compares their applicability (and limitations) as means of communication.

420 **Table B.1 — Applicability (and limitations) of asset tracking technologies**

	Minimum size	Data Density (characters)	Means of directing users to online content?	Low cost of creation per unit?	Readable with commonly available tools?	Creation with commonly available tools?	Minimal environmental impacts?	High data density?	Suitable for cylindrical objects?	Ability to read in different orientations?	High processing speed?	Ability to track items enclosed within an assembly?	Real time location tracking?	Durable to damage?	Limited lifetime?
QR code	25 mm × 25 mm	≤ 4296 alpha-numeric	✓	✓	✓	✓	✓	✓	✗	✓	✗	✗	✗	✓	✗
Micro QR code	5,25 mm × 5,25 mm	35 numeric			✓		✓	✗					✗		✗
IQR code		> 4296 alpha-numeric	✓		✓		✓		✓				✗		✗
High Capacity Coloured 2D Code	30,5 mm × 12,7 mm	16	✓		✓		✓	✓					✗		✗
Barcode	2 mm × 2 mm (specialist applications)	24	✗		✓		✓	✗	✓	✗	✗	✗	✗	✗	✗
Passive RFID			✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓		
Active RFID	8,3 mm × 8,3 mm × 0,7 mm	≤ 4296 alpha-numeric	✗	✗	✗	✗	✗		✓	✓	✓		✓		✓
NFC	25 mm × 25 mm	35 numeric			✓					✓		✓	✗		

NOTE In the table, the tick mark mean “usually possible”, the cross mean “not usually possible”, and blanks “information not available or not relevant”.

Annex C
(informative)

Example format for reporting ME information

C.1 General

The following is an example of a format which can be used for reporting ME information. It is not intended to be prescriptive, but rather should be seen as a guide which could be adapted for different audiences as required. It could be used as a basis to develop a reporting format for a product publication. It could also be used by a manufacturer to report on a voluntary basis on any of the topic-related content of interest to them.

Some material efficiency topics may not be relevant to all products or groups of products, and therefore this format could be tailored as required, by removing sections and tables / columns as necessary, and populating the tables with parameters as relevant for each specific ME topic. Likewise, where some topics require more detailed information to be provided, additional columns could be added to the tables or the tables could be modified to suit their purpose.

Following an approach such as this is intended to:

- provide uniform and convenient format to communicate ME information;
- achieve a greater consistency in the way ME data are laid out by different parties, for example naming conventions (symbols, indexes) and the specification of measurement units.

Results can be presented for a product-group, product (unit), (priority) part, or material (for example a critical raw material), as relevant. Examples of the three types of tables, (quantitative, qualitative and material/substance content) are shown in Tables C.1 – C.3, containing dummy data for illustration purposes:

Table C.1 — Quantitative ME contents

Quantitative assessment: vacuum cleaner 'XYZ'								
Product (part)	**Parameter**	**Symbol / Abbrevia-tion**	**Tolerance or Expected Range**	**Target[a]**		**Product Result**		**References[b]**
				target	**unit**	**result**	**unit**	
Vacuum cleaner hose	Oscillations under strain			40 000	oscilla-tions	50 000	oscilla-tions	EU No 666/2013
Vacuum cleaner motor	Operational motor lifetime		(5 %)	500	hours	700	hours	EU No 666/2013

[a] The "Target" should be populated based on requirements within existing legislation or based upon manufacturer ambitions if legislative targets are not specified.

[b] The reference standards column should include the short reference for the respective standards, legislation, and other requirements relevant to the assessment. Full references can be provided in the references section.

443 **Table C.2 — Qualitative ME contents**

Qualitative assessment: vacuum cleaner 'XYZ'				
Parameter	**Target[a]** ***(e.g. Compulsory / Optional)***	**Product Result** ***(e.g. Available / Not Available)***	**Details of provisions and/or Exemptions** ***(i.e. location of information)***	**References[b]**
Information relevant for dismantling, particularly in relation to the motor and any batteries	Compulsory	Available	Located in technical document and part for professionals of the free access website	EU No 666/2013

[a] The "Target" should be populated based on requirements within existing legislation or based upon manufacturer ambitions as relevant.

[b] The reference standards column should include the short reference for the respective standards, legislation, and other requirements relevant to the assessment. Full references can be provided in the references section.

444 **Table C.3 — Material / Substance (declaration) content**

Material / Substance content assessment: Electronic Component 'ABC4523'									
Total product (part) weight:			0,12 g						
Identifier Product (part) or material	**Name of the substance/ substance group**	**CAS number**	**Threshold[a,b]**		**Assessment Result**			**Sup-plier Ident-ifier**	**References[c]**
			Level	**Unit**	**Result / Range** ***(mass/ mass%)***	**Unit**	**Location in the product (part)**		
ABC4523 (Electronic component)	Gold	7440–57–5	≥ 1,0	mg/kg	2,4	mg	termination	ABC	EN IEC 62474:2012 ABC proprie-tary tool
ABC4523 (Electronic component)	Silver	7440–22–4	≥ 1,0	mg/kg	1,8	mg	electrodes	ABC	EN IEC 62474:2012 ABC proprie-tary tool
ABC4523 (Electronic component)	Palladium	7440–05–3	Intenti onally used	N/A	0,6	mg	electrodes	ABC	EN IEC 62474:2012 ABC proprie-tary tool

[a] The "Threshold" should be populated based on requirements within existing legislation or based upon manufacturer ambitions as relevant;

[b] If exempted, state the exemption;

[c] The reference standards column should include the short reference for the respective standards, legislation, and other requirements relevant to the assessment. Full references can be provided in the references section.

C.2 Template for reporting ME information

START of TEMPLATE

[Placeholder for company logo/trademark]

Product Material Efficiency Profile

In accordance with the standards series EN 45552 – EN 45558 for:

[Product name]

[Company name]

General

Issue date:	20xx-yy-zz
Validity date:	20xx-yy-zz
Revision date:	20xx-yy-zz
Geographical scope:	Global, Region, Country(ies) (e.g. Europe or Spain)
Document owner:	Name and address of the instigator of the assessment or contact person
Company details:	Information about the company, including as relevant name, website, and contact information
< Other relevant > :	

[Placeholder for product image if convenient]

Scope

Scope of assessment, including as relevant, a complete and accurate report of:

1. **Description of product or product-group assessed** including, as relevant, general product description, description of the declared unit, image, customs procedure codes (CPC) and other relevant information;

2. **Description of assumptions applied,** including for instance the environmental and operating conditions for which the assessment is valid.

Data and approach used for the assessment

Description of the input data (including reference date), other information used/needed for the assessment and calculations or scoring as relevant. In the case that a specific tool or method has been used for the assessment, describe it as relevant.

Material efficiency information

For each material efficiency topic to be reported, insert results in quantitative, qualitative and/or material / substance content tables as relevant, under each of the following material efficiency topic headings:

- RELIABILITY / DURABILITY;
- ABILITY TO REPAIR AND UPGRADE;
- WHOLE PRODUCT REUSE;
- COMPONENT / PARTS REUSE;
- REMANUFACTURABILITY;
- RECYCLABILITY AND RECOVERABILITY;
- RECYCLED CONTENT;
- CRITICAL RAW MATERIALS CONTENT.

< Material efficiency topic > :

Quantitative assessment: <product>								
Product (part)	**Parameter**	**Symbol / Abbreviation**	**Tolerance or Expected Range**	**Target[a]**		**Product Result**		**References[b]**
				target	**unit**	**result**	**unit**	

[a] The “Target” should be populated based on requirements within existing legislation or based upon manufacturer ambitions if legislative targets are not specified.

[b] The reference standards column should include the short reference for the respective standards, legislation, and other requirements relevant to the assessment. Full references can be provided in the references section.

Qualitative assessment: <product>				
Parameter	**Target[a]** ***(e.g. Compulsory / Optional)***	**Product Result** ***(e.g. Available / Not Available)***	**Details of provisions and/or exemptions** ***(e.g. location of information)***	**Referen-ces[b]**

[a] The “Target” should be populated based on requirements within existing legislation or based upon manufacturer ambitions as relevant.

[b] The reference standards column should include the short reference for the respective standards, legislation, and other requirements relevant to the assessment. Full references can be provided in the references section.

Material / Substance Content Assessment: <product>									
Total product (part) weight:			< X,XX > <unit>						
Identifier Product (part) or material	**Name of the substance/ substance group**	**CAS number**	**Threshold[a,b]**		**Assessment Result**			**Sup-plier Identi fier**	**References[c]**
			Level	**Unit**	**Result / Range *(mass/ mass%)***	**Unit**	**Location in the product (part)**		

[a] The "Threshold" should be populated based on requirements within existing legislation or based upon manufacturer ambitions as relevant;

[b] If exempted, state the exemption;

[c] The reference standards column should include the short reference for the respective standards, legislation, and other requirements relevant to the assessment. Full references can be provided in the references section.

Other material efficiency indicators

Add as applicable.

Additional information

This can include, as required, a complete and accurate report of the results, conclusions, data and methods.

References

This section includes a full list of:

- standards used to perform the assessment (dated), name, version;
- tools used to perform the assessment;
- policies and other requirements applicable to the assessment.

END of TEMPLATE

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[4] EN 45552:—,[2] *General method for the assessment of the durability of energy-related products*

[5] EN 45553:—,[3] *General method for the assessment of the ability to re-manufacture energy-related products*

[6] EN 45554:—,[4] *General methods for the assessment of the ability to repair, reuse and upgrade energy-related products*

[7] EN 45555:—,[5] *General methods for assessing the recyclability and recoverability of energy related-products*

[8] EN 45556:—,[6] *General method for assessing the proportion of reused components in energy-related products*

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[1] Under preparation. Stage at the time of publication: CEN-CLC/prTR 45550:2018
[2] Under preparation. Stage at the time of publication: prEN 45552:2018
[3] Under preparation. Stage at the time of publication: prEN 45553:2018
[4] Under preparation. Stage at the time of publication: prEN 45554:2018
[5] Under preparation. Stage at the time of publication: prEN 45555:2018
[6] Under preparation. Stage at the time of publication: prEN 45556:2018
[7] Under preparation. Stage at the time of publication: prEN 45557:2018
[8] Under preparation. Stage at the time of publication: FprEN 45558:2018