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General method for assessing the proportion of reused components in products
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IEC 63333:2023

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

GENERAL METHOD FOR ASSESSING THE PROPORTION OF REUSED COMPONENTS IN PRODUCTS

FOREWORD

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IEC 63333 has been prepared by IEC technical committee 111: Environmental standardization for electrical and electronic products and systems. It is an International Standard.

It is based on EN 45556:2019, which was prepared by the CEN and CENELEC Joint Technical Committee 10 "Energy-related products – Material efficiency Aspects for Ecodesign" (CEN-CLC/JTC 10). The document has been adopted [with modifications].

The text of this International Standard is based on the following documents:

| Draft | Report on voting |
|--------------|------------------|
| 111/705/FDIS | 111/718/RVD |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

This document provides general methods for assessing the proportion of reused components in products and is intended to be used by manufacturers that want to assess the proportion of reused components in their products. It can be also used by technical committees when developing assessment methods dedicated to their product or product-group publications.

Four calculation methods based on the mass of reused components and the number of reused components are presented. Other methods can exist and be more suitable for certain products or product-groups. While writing product publications on assessing the proportion of reused components, product technical committees can apply the most suitable method for their product (or groups of products).

This document is based on the European standard EN 45556:2019 [1]¹, which is part of a family of publications developed by the European CEN and CENELEC Joint Technical Committee 10. It comprises the standardization deliverables in the numerical range of 45550 to 45559, covering topics related to the following material efficiency aspects:

- extending product lifetime;
- ability to reuse components or recycle materials from products at end-of-life;
- use of reused components or recycled materials in products or both.

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¹ Numbers in square brackets refer to the Bibliography.

GENERAL METHOD FOR ASSESSING THE PROPORTION OF REUSED COMPONENTS IN PRODUCTS

1 Scope

This document deals with the assessment of the proportion of reused components in products on a horizontal level, which can be applied at any point in the life of the product.

This document applies to electrical and electronic products. It can also be applied to other product types.

This document is intended to be used in the assessment of the proportion of reused components in products. It can also be used by technical committees when developing assessment methods dedicated to their product or product-group publications.

Aspects like performance, validation, verification and suitability of reused components are not in the scope of this document. It is the responsibility of the user of this document to address these aspects.

This document has the status of a horizontal publication in accordance with IEC Guide 108 [2].

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

component

constituent of a product which cannot be fragmented without losing its particular function

EXAMPLE Resistor, capacitor, diode, antenna, screw, mounting bracket.

[SOURCE: IEC 60050-151:2001, 151-11-21 [3], modified – In the definition "part of a device" has been replaced by "of a product", "physically divided into smaller parts" has been replaced by "fragmented" and the examples have been added.]

3.2

reused component

component removed from a product and used again in another product

Note 1 to entry: A component is reused with or without alteration (e.g. functional or aesthetics alteration).

Note 2 to entry: A component is reused for the same or a different purpose.

Note 3 to entry: A concept diagram of a reused component is shown in Figure 1.

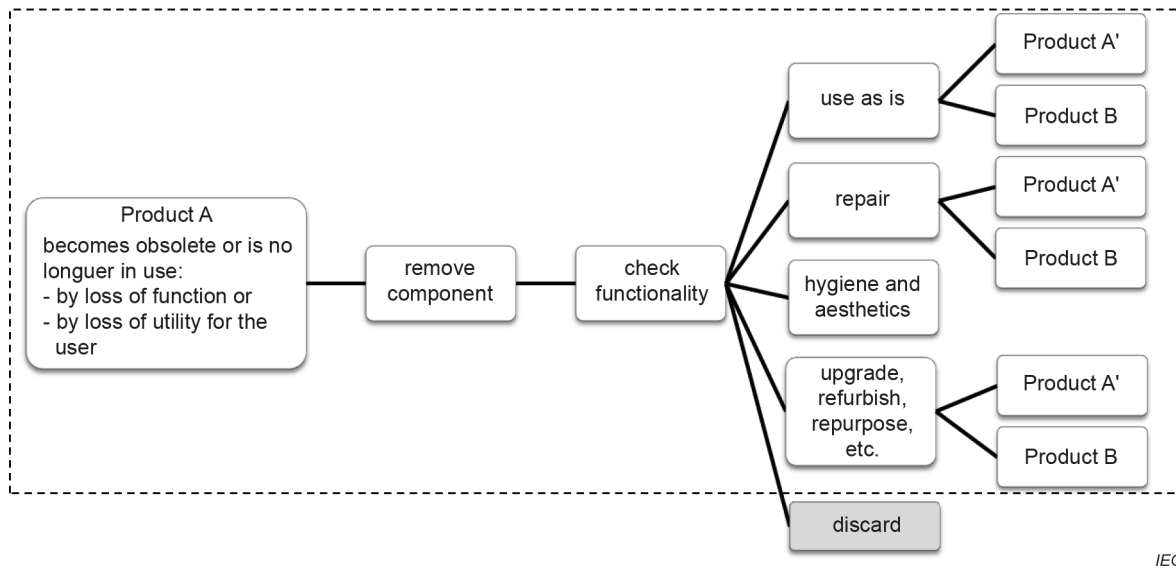


Figure 1 – Concept diagram of a reused component

4 Assessment method for the proportion of reused components in a product

4.1 General considerations

As there are no methods available for directly measuring the proportion of reused components in a product it can be only determined indirectly. Therefore, the verification is by means of documented evidence from the manufacturer, supplier or authorized distributor or any combination of the three. Aspects of traceability, including identification of the reused component or groups of reused components, shall be included in the documentation (see more details in Clause 5 and Annex A).

There is no obligation to collect information for all components, but only components verified as having been previously used can be accounted for as reused components.

NOTE The performance characteristics of reused components can change over time and can be relevant for some product groups. For this document, the performance characteristics of components are not taken into account.

4.2 Calculation of the proportion of reused components

4.2.1 General

The user of this document shall apply at least one of the formulas presented in 4.2.2 to 4.2.5 to calculate the proportion of reused components in products:

- based on product level, by assessing each product individually (as given in 4.2.2 and 4.2.3) or,
- based on mass balance or number balance over a period of time (4.2.4 and 4.2.5).

The period accounted shall be specified, not exceed one year and shall be representative of the production volume.

4.2.2 Proportion of reused components by mass on product level

Formula (1) shall be applied to obtain the proportion of reused components by mass on a product level (expressed in percentage):

$$R_{pm} = \left(\frac{m_{re}}{m_{tot}} \right) \times 100\% \quad (1)$$

where

m_{re} is the total mass of the used components or groups of components (e.g. a printed circuit board assembly, PCBA) in the assessed product;

m_{tot} is the total mass of the product;

R_{pm} is the proportion of reused components by mass of the product.

NOTE 1 All masses are expressed in the same unit and have the same number of significant digits to the right of the decimal separator.

NOTE 2 Components mass based calculation is easy to apply consistently across different products within a product group.

NOTE 3 In some cases, the mass of a component or a group of components does not correlate with its economic value or environmental impact.

See Annex B, Clause B.1 for examples of the application of Formula (1).

4.2.3 Proportion of reused components by number on product level

Formula (2) shall be applied to obtain the proportion of reused components by number on a product level (expressed in percentage):

$$R_{pn} = \left(\frac{n_{re}}{n_{tot}} \right) \times 100\% \quad (2)$$

where

n_{re} is the total number of the used components or groups of components in the assessed product;

n_{tot} is the total number of components in the product;

R_{pn} is the proportion of reused components by number on the product level.

NOTE 1 Assessment based on the number of components can be applied consistently across different products in a product group.

NOTE 2 In some cases, the number of components or groups of components do not correlate with their economic value or environmental impact.

It is essential that at a product or product-group level, a common way to identify and count components and groups of components is defined.

See Clause B.2 for examples of the application of Formula (2).