INTERNATIONAL STANDARD

ISO 8887-2

First edition
2023-05

Technical product documentation — Design for manufacturing, assembling, disassembling and end-of-life processing —

Part 2: Vocabulary

Conception et documentation pour la fabrication, le montage, le démontage et le traitement en fin de vie (MADE) —

Partie 2: Vocabulaire

Reference number
ISO 8887-2:2023(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 10, *Technical product documentation*.

A list of all parts in the ISO 8887 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In recent years, policymakers throughout the world have focused their attention on ways to reduce environmental impact. In many countries this has led to, or will soon lead to, new incentives with the result that end-of-life processes now need to be considered at the design stage. Consequently, there is an increasing focus on not only the production of a product but also what is to be done when the user has finished with it. Thus, the ISO 8887 series includes consideration of disassembling the product and the treatment of the components through processes such as remanufacturing, recycling, reusing through multiple life cycles or disposing.

The ISO 8887 series aims to specify the documentation requirements for integrating these environmental aspects into the design and development of products. It relates to the following four stages:

with regard to production:

— the manufacturing of the components;

— the assembling of the components to produce a product;

with regard to end of use:

— the disassembling into components;

— the end-of-life processing of these components.

The ISO 8887 series addresses the design task, irrespective of whether the designer works for a manufacturer or a design company or is freelance. It is applicable to all types of manufactured products.

Technical product documentation — Design for manufacturing, assembling, disassembling and end-of-life processing —

Part 2: Vocabulary

1 Scope

This document defines terms for design for manufacturing, assembling, disassembling and end-of-life processing.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

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

3.1
assembling
assemble
bringing together of *components* (3.6) in a functional relationship

3.2
assembly
<design for MADE> number of *components* (3.6) fitted together to perform a specific function

[SOURCE: ISO 10209:2022, 3.1.8, modified — The definition has been adjusted for design for MADE.]

3.3
commercially off-the-shelf
COTS
bought-out standard *components* (3.6) available to buy from a catalogue or other generally available source

3.4
brief
design brief
working document which specifies at any point in time the relevant needs and aims, the resources of the client and user, the context of the project and any appropriate design requirements within which all subsequent briefing (when needed) and designing can take place

Note 1 to entry: The term “design brief” is used interchangeably with “brief” in the ISO 8887 series.

3.5
carbon footprint of a product
CFP
sum of greenhouse gas emissions and greenhouse gas removals in a product system, expressed as carbon dioxide equivalents and based on a life cycle assessment using the single impact category of climate change

[SOURCE: ISO 14050:2020, 3.11.1]

3.6
component
part
constituent part of equipment that cannot be physically divided into smaller parts without losing its character

[SOURCE: ISO 10209:2022, 3.1.15, modified — "part" was included as an admitted term.]

3.7
custom component
component (3.6) made specifically for a *product* (3.47) or related series of products

3.8
hazardous substance
hazardous preparation
substance or preparation that is, under certain conditions, likely to be injurious to health, safety or the environment

Note 1 to entry: The use of such substances is often restricted by law.

3.9
ecodesign
systematic approach that considers environmental aspects in design and development with the aim to reduce adverse environmental impacts throughout the *life cycle* (3.17) of a *product* (3.47)

[SOURCE: ISO 14050:2020, 3.5.22]

3.10
disassembling
disassembly
taking apart of an assembled *product* (3.47) into constituent materials and/or *components* (3.6)

3.11
disposal
any operation which is not recovery even where the operation has, as a secondary consequence, the reclamation of substances or energy

Note 1 to entry: Based on Waste Framework Directive[1].

3.12
end-of-life
point at which a *product* (3.47) or *component* (3.6) is taken out of the current use stage

3.13
energy recovery
production of useful energy from waste through direct and controlled combustion or gasification

[SOURCE: ISO 15270:2008, 3.11, modified — Definition revised.]

3.14
environmental aspect
element of an organization's activities or *products* (3.47) that interacts or can interact with the environment

[SOURCE: ISO 14050:2020, 3.2.20]

3.15
environmental impact
change to the environment, whether adverse or beneficial, including possible consequences, wholly or partially resulting from an organization's *environmental aspects* (3.14)

[SOURCE: ISO 14050:2020, 3.2.22]

3.16
fluff
fibrous waste, produced where it has the potential to interfere with subsequent operation

Note 1 to entry: Particularly applicable to the automotive industry.

3.17
life cycle
consecutive and interlinked stages from raw material acquisition or generation from natural resources to final disposal

[SOURCE: ISO 14050:2020, 3.6.1]

3.18
machine assembly
robotic assembly
assembly carried out by programmed machinery

3.19
maintenance
activities carried out to keep a *product* (3.47) in its original, useable state within the current *life cycle* (3.17)

Note 1 to entry: This includes planned inspections and replacement of components, as necessary.

3.20
manufacturing
production of *components* (3.6)

3.21
material reduction
modification of the design of *components* (3.6) and *assemblies* (3.2) to achieve the same performance using less material

3.22
orientation
rotational position in space (relative or absolute) a *component* (3.6) has to have in order for some operation or *assembly* (3.2) process to be carried out

3.23
handling
transporting, moving or manipulating *components* (3.6) and/or *assemblies* (3.2) during the production process

3.24
process, verb
transform a material, *component* (3.6) or *assembly* (3.2) from one configuration or state to another

3.25
process, noun
<industrial systems> set of interacting operations by which material, energy or information is transformed, transported or stored

3.26
refurbishing
refurbish
refurbishment
reconditioning
recondition
industrial process which returns a used *product* (3.47), or *component* (3.6) to a satisfactory performance level when made available on the market as a used product

Note 1 to entry: The refurbisher by whom the product has been refurbished shall be indicated by a "refurbished by" or by the type plate of the refurbisher.

Note 2 to entry: With respect to refurbishing:

— manufacturing effort involves the replacement of worn or broken components but is generally more extensive than for repair;

— performance after refurbishing is expected to perform its intended role but the overall performance is likely to be inferior to that of the original model;

— any subsequent warranty is generally less than that for a new or remanufactured product but is likely to cover the whole product (unlike repair); refurbished products do not require a warranty equivalent to that of a newly manufactured equivalent.

3.27
recovery
process in which waste material is either treated to release materials in a form where they can be used again or used as fuel in energy recovery

3.28
recycling
recycle
reprocessing a material or *component* (3.6) which has previously been processed for inclusion in a *product* (3.47)

3.29
remanufacturing
remanufacture
industrial process which creates a new *product* (3.47), from used products, or *components* (3.6), which has to be placed on the market

Note 1 to entry: Original manufacturers are not obliged to disclose technical documents to the remanufacturer for the reason of know-how protection.

3.30
renewable
replenishable from natural sources at a rate greater than consumption

Note 1 to entry: This can apply to materials and energy.

3.31
repairing
repair
returning a faulty, worn or broken *product* (3.47) or *component* (3.6) back to a usable state

Note 1 to entry: A repair may use remanufactured or refurbished components.

Note 2 to entry: With respect to repairing:

— manufacturing effort is the minimum required to address the specified fault;

— after repair, the product is expected to be in a useable state, but assurances of performance are generally limited to the repaired component;

— any subsequent warranty is generally less than that of newly manufactured, remanufactured or refurbished equivalents and may apply only to the component that has been replaced or repaired.

3.32
repurposing
repurpose
utilize a *product* (3.47) or its *components* (3.6) in a role that it was not originally designed to perform

Note 1 to entry: This action deals specifically with products and assemblies and not materials, which fall under recycling.

Note 2 to entry: In some cases, repurposing will lead to a substantial modification, i.e. a new product which has to be placed on the market.

3.33
reusing
reuse
operation by which a *product* (3.47) or its *components* (3.6) are put back into use for the same purpose at *end-of-life* (3.12)

Note 1 to entry: Based on The WEEE Directives[2].

3.34
reverse engineering
analysis of the shape, dimensions and function of a *product* (3.47) to obtain information

3.35
set-up
particular configuration of *components* (3.6) and tooling for a specific operation

3.36
shredding
process of cutting or tearing which reduces *products* (3.47) and/or materials to smaller pieces

3.37
sub-assembly
set of *components* (3.6), built as a single unit, forming part of a subsequent larger *assembly* (3.2)

3.38
supply chain
series of organizations which apply processes at any point within the *life cycle* (3.17)

Note 1 to entry: Typically, this would be taken to mean the supply of a product to market but can also include replacement of components and return to manufacture.

3.39
sustainable design
discipline that aims to optimize the positive environmental, economic and social impacts of a *product* (3.47)

3.40
technical product documentation
TPD
means of conveying all or part of a design definition or specification of a *product* (3.47)

3.41
technical product realization
TPR
system facilitating cooperation between disciplines to effect conversion of a concept into correctly functioning workpieces or *product* (3.47), to time and with minimal rework or reject requirement

3.42
technical product specification
TPS
collection of technical product documents comprising the complete design definition and specification of a *product* (3.47), for manufacturing and verification purposes

3.43
tooling
devices necessary to manufacture, hold or position a *component* (3.6) or components for processing

3.44
design validation
process of proving a design by testing to demonstrate conformity of the *product* (3.47) to design requirements and performance ratings

[SOURCE: ISO 15551:—, 3.40]

3.45
whole-life costs
costs incurred or arising out of the creation, fabrication, use, maintenance, disposal and final elimination of a *product* (3.47)

Note 1 to entry: This also includes the costs to recruit, train and retrain personnel, and other indirect costs in the organization.

Note 2 to entry: The effect of reuse on whole-life cost, C_{wl}, is:

$$C_{wl} = \frac{C_{oem} + nC_{rmf} + C_{oel}}{1+n}$$

where

C_{oem} is the cost of original manufacture;

C_{rmf} is the cost of remanufacturing;

C_{eol} is the end-of-life cost;

n is the number of times the product is remanufactured.

3.46
core
component (3.6) or *product* (3.47) retained throughout the *end-of-life* (3.12) process

Note 1 to entry: Core is generally obtained either as a discrete unit or as a component or subcomponent of a larger product. Acquiring core varies from sector to sector but can include warranty returned product; user send-back schemes; collection through servicers, repairers or brokers; removal from larger scrapped products; part-exchanges; deposit returns; service contracts and recovery from waste streams. Core can also be obtained from customers who wish to have work performed on their specific product with the expectation of receiving the same product back.

Note 2 to entry: The definition of core is dependent on the condition of its assemblies and components, for example fixings are not necessarily part of the core.