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TECHNICAL SPECIFICATION

SPECIFICATION TECHNIQUE

colour inside

Switchgear and controlgear and their assemblies for low voltage – Environmental aspects

Appareillages et ensembles d'appareillages basse tension – Aspects environnementaux

IEC TS 63058:2021-01(en-fr)

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SWITCHGEAR AND CONTROLGEAR AND THEIR ASSEMBLIES FOR LOW VOLTAGE –

Environmental aspects

FOREWORD

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IEC TS 63058 has been prepared by IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft TS	Report on voting
121/54/DTS	121/58A/RVDTS

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 Technical Specification 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/standardsdev/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- withdrawn,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

Increasingly, there is a focus on preserving the natural environment for the good of future generations. For this to be achieved, efficient use of energy and materials throughout the life cycle of every product and process to conserve world's finite natural resources is essential. In addition, release of substances and materials that might be harmful for the environment or induce climatic changes are to be avoided or minimized. From conception to end of life of a product, the environmental impact of all the relevant processes should be considered, including how materials are disposed of or recovered for future use.

In order to contribute to conserving natural resources, manufacturers of low-voltage switchgear and controlgear and their assemblies should ensure an environmentally conscious design (ECD) involving:

- phasing-out or minimizing use of hazardous substances or materials;
- efficient use of energy and materials in the manufacture of products;
- ensuring the lowest practical energy consumption by the products while they are in use;
- at the end of product life, the possibility, as far as practical, of recycling materials for future use, and sorting hazardous components requiring a specific treatment.

Declarations and ECD are increasingly required and in some instances mandated. These can take several forms, for example, Type II or Type III environmental declaration, material declaration (MD). In some business, Green Public Procurement (GPP) is applicable and/or ECD is part of the ISO 14001 certification. Some countries and regions are also actively pushing for environmental conservation, for example, the European Union through its Ecodesign Directive and China through Ecodesign Initiative. Systematic demands for ECD will be required by most, if not all customers, in the medium term.

Assessing the environmental impact of low-voltage switchgear and controlgear and their assemblies is part of an ECD process. ECD requires the identification, measurement and reporting of particular impacts. IEC 62430 describes the basic principles of ECD, with the goal of reducing the potential environmental impacts of products.

Generally, the environmental impact of low-voltage switchgear and controlgear and their assemblies is very low compared with that of the overall system into which they are incorporated and the processes to which they contribute. The lifetime impact of processes such as the air-conditioning of a building, the manufacture of steel or shipping far exceed that of the manufacture and use of any associated low-voltage switchgear and controlgear.

Even though low-voltage switchgear and controlgear and their assemblies have a relatively minor impact on the environment, there is a market need for appropriate methods for managing these environmental matters. A simplified means of estimating the environmental impacts is required together with readily available data to make the stakeholder's, for example contractor's, installer's and end user's, task of assessing environmental impacts at system level easier.

Specific rules for assessing the environmental impacts and providing appropriate data for low-voltage switchgear and controlgear and their assemblies are among the purposes of this document. These rules establish a common evaluation scheme of their environmental impacts in terms of characterized impact indicators (e.g. CO_2-equivalents, ozone depletion) over their whole life cycle.

SWITCHGEAR AND CONTROLGEAR AND THEIR ASSEMBLIES FOR LOW VOLTAGE –

Environmental aspects

1 Scope

This document, which is a Technical Specification, provides guidance to manufacturers of low-voltage switchgear and controlgear and their assemblies in evaluating and improving the environmental impact of their products, and in enabling effective communication using common references for environmental information throughout the supply chain.

This document provides:

– guidance on the process and general aspects to implement environmentally-conscious product design principles, as given in IEC 62430, essential for low-voltage switchgear and controlgear and their assemblies;

– the Product Specific Rules (PSR) for Life Cycle Assessment (LCA);

NOTE 1 The general methods and the process to execute the LCA are in accordance with ISO 14040 and ISO 14044 but not addressed in this document.

NOTE 2 PSR and LCA can be used for quantitative ECD and also apply for some environmental declarations, for example Type III.

– standard environmental impact data derived from case studies and a means of using them;

NOTE 3 This is to encourage manufacturers to apply more effective quantitative methods in the ECD process to improve the environmental efficiency of their products.

– common rules for communicating information about the presence of regulated substances and the materials contained in the product, according to IEC 62474;

– guidance on communicating information about the end of life treatment of the product.

NOTE 4 This document is intended to replace Annex O and Annex W of IEC 60947-1:2020.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60050-904, *International Electrotechnical Vocabulary (IEV) – Part 904: Environmental standardization for electrical and electronic products and systems* (available at www.electropedia.org)

IEC 61439-1:2020, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

IEC 62430:2019, *Environmentally conscious design (ECD) – Principles, requirements and guidance*

IEC 62474:2018, *Material declaration for products of and for the electrotechnical industry*

IEC 62474-DB[1], *Material declaration for products of and for the electrotechnical industry* (available at http://std.iec.ch/iec62474)

[1] "DB" refers to the IEC on-line database.

IEC TR 62635:2012, *Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability rate calculation of electrical and electronic equipment*

ISO 14006, *Environmental management systems – Guidelines for incorporating ecodesign*

ISO 14021:2016, *Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)*

ISO 14025:2006, *Environmental labels and declarations – Type III environmental declarations – Principles and procedures*

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

ISO 14044:2006, *Environmental management – Life cycle assessment – Requirements and guidelines*
ISO 14044:2006/AMD1:2017
ISO 14044:2006/AMD2:2020

ISO 14045:2012, *Environmental management – Eco-efficiency assessment of product systems – Principles, requirements and guidelines*

EN 45558:2019, *General method to declare the use of critical raw materials in energy-related products*

EN 50693:2019, *Product category rules for life cycle assessments of electronic and electrical products and systems*

Reference Life Cycle Data System (ILCD) Handbook, *Recommendations for Life Cycle Impact Assessment in the European context. First edition November 2011. EUR 24571*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-904 and the following apply.

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

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

3.1.1
declarable substance group
group of substances included in the IEC 62474-DB at the date the material declaration is made

Note 1 to entry: Substance group is multiple CAS # (for example Lead compounds).

3.1.2
end of life
life cycle stage of a product starting when it is removed from its intended use phase

[SOURCE: IEC TR 62635:2012, 3.2, modified – Hyphens deleted in term, alternate term deleted, "use-stage" replaced with "use phase".]

3.1.3
end of life treatment
operation after a waste has been handed over to a facility for product and product part reuse, material recycling, energy recovery and residue disposal

Note 1 to entry: This includes dismantling, material separation and disposal.

[SOURCE: IEC TR 62635:2012, 3.3, modified – Hyphens in term deleted, insertion of Note 1 to entry.]

3.1.4
energy recovery
production of useful energy through direct and controlled combustion or other processing of waste

Note 1 to entry: Waste incinerators producing hot water, steam and/or electricity are common means for energy recovery.

[SOURCE: IEC 60050-904:2014, 904-04-03]

3.1.5
environment
surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation

Note 1 to entry: Surroundings can extend from within an organization to the local, regional and global system.

Note 2 to entry: Surroundings can be described in terms of biodiversity, ecosystems, climate or other characteristics.

[SOURCE: ISO 14001:2015, 3.2.1, modified – "interrelationships" replaced with "interrelation" in the definition.]

3.1.6
environmental aspect
element of an organization's activities or products that interacts or can interact with the environment

Note 1 to entry: An environmental aspect can cause (an) environmental impact(s). A significant environmental aspect is one that has or can have one or more significant environmental impact(s).

Note 2 to entry: Significant environmental aspects are determined by the organization applying one or more criteria.

[SOURCE: ISO 14001:2015, 3.2.2, modified – "or services" deleted in the definition.]

3.1.7
environmental claim
statement, symbol or graphic that indicates an environmental aspect of a product, a component or packaging

Note 1 to entry: An environmental claim may be made on product or packaging labels, through product literature, technical bulletins, advertising, publicity, telemarketing, as well as through digital or electronic media such as the Internet.

[SOURCE: ISO 14021:2016, 3.1.4]

3.1.8
environmentally conscious design
systematic approach which considers environmental aspects in the design and development with the aim to reduce adverse environmental impacts throughout the life cycle of a product

Note 1 to entry: Other terminology used worldwide with the same meaning includes ecodesign, design for environment (DFE), green design and environmentally sustainable design.

[SOURCE: IEC 62430:2019, 3.1.1, modified – Abbreviated term "ECD" and Note 2 to entry deleted.]

3.1.9
environmental declaration program
voluntary program for the development and use of Type III environmental declarations, based on a set of operating rules (program instructions)

[SOURCE: ISO 14025:2006, 3.3, modified – "Type III" removed from the term and "(program instructions)" added to the definition.]

3.1.10
environmental impact
change to the environment, whether adverse or beneficial, wholly or partly resulting from an organization's environmental aspects

[SOURCE: ISO 14001:2015, 3.2.4]

3.1.11
environmental declaration
claim which indicates the environmental aspects of a product or a service, for example a Type II or a Type III environmental declaration or a product environmental footprint

Note 1 to entry: An environmental label or declaration may take the form of a statement, symbol or graphic on a product or package label, in product literature, in technical bulletins, in advertising or in publicity, amongst other things.

[SOURCE: ISO 14020:2000, 2.1, modified – First preferred term "environmental label" deleted and "for example a Type II or a Type III environmental declaration or a product environmental footprint" added.]

3.1.12
Type II environmental declaration
environmental declaration providing self-declared environmental claims according to ISO 14021:2016

3.1.13
Type III environmental declaration
environmental declaration providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information

Note 1 to entry: For a Type III declaration, an environmental declaration program is used, including program instructions and product category rules. The predetermined parameters are based on ISO 14040 and ISO 14044.

Note 2 to entry: The additional environmental information may be quantitative or qualitative.

[SOURCE: ISO 14025:2006, 3.2, modified – Note 1 to entry modified.]

3.1.14
environmental management system
part of the management system used to manage environmental aspects, fulfil compliance obligations, and address risks and opportunities

[SOURCE: ISO 14001:2015, 3.1.2]

3.1.15
LCA functional unit
quantified performance of a product system for use as a reference unit

[SOURCE: ISO 14040:2006, 3.20, modified – Addition of "LCA" in term.]

3.1.16
standard data
secondary data applicable to a homogeneous product family as resulting from a study

3.1.17
specific data
data directly collected, measured or estimated for a specific product

3.1.18
hazardous substance
substance that can adversely impact the environment with immediate or retarded effect

3.1.19
homogeneous product family
subgroup of a product family where the environmental aspects can reasonably be expected to be similar and therefore scalable over the group through a function of certain parameter, for example electrical ratings or weight

3.1.20
LCA report
accompanying document to the life cycle assessment as a basis to the environmental declaration giving further detailed information about the inputs, outputs, used LCI-data and the made assumptions in regard to this document

Note 1 to entry: The LCA report is not meant for external communication but has to be kept for justification proposes in terms of environmental declaration verification or market surveillance.

3.1.21
life cycle
consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to the final disposal

[SOURCE: ISO 14040:2006, 3.1]

3.1.22
life cycle assessment
compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle

[SOURCE: ISO 14040:2006, 3.2, modified – Abbreviated term "LCA" deleted.]

3.1.23
life cycle inventory
inventory of flows from and to nature for a product system

Note 1 to entry: Inventory flows include inputs of water, energy, and raw materials, and releases to air, land, and water.

Note 2 to entry: LCI according to the ILCD Guidelines are available in the Life Cycle Data Network (LCDN).

3.1.24
life cycle stage
element of a life cycle

EXAMPLE Raw material acquisition and production, manufacturing, packaging and distribution, installation and use, maintenance and upgrading, and end of life.

Note 1 to entry: The phrase "life cycle phase" is sometimes used interchangeably with "life cycle stage".

3.1.25
material
substance or mixture of substances within a product or product part

[SOURCE: IEC 62474:2018, 3.15]

3.1.26
material class
defined classification of materials that are established in the referenced IEC 62474 database for purposes of inventorying aspects of a product, such that no two classes contain the same materials

[SOURCE: IEC 62474:2018, 3.16, modified – Deletion of the note to entry.]

3.1.27
organization
person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives

[SOURCE: ISO 9000:2015, 3.2.1, modified – Notes 1 and 2 to entry deleted.]

3.1.28
packaging
material that is used to protect or contain a product during transportation, storage, marketing or use

Note 1 to entry: For the purposes of this document, the term "packaging" also includes any item that is physically attached to, or included with, a product or its container for the purpose of marketing the product or communicating information about the product.

[SOURCE: ISO 14021:2016, 3.1.13]

3.1.29
process
set of interrelated or interacting activities which transform inputs into outputs

Note 1 to entry: Inputs to a process are generally outputs of other processes.

Note 2 to entry: Processes in an organization are generally planned and carried out under controlled conditions to add value.

[SOURCE: ISO 9000:2015, 3.4.1, modified – "that use inputs to deliver an intended result" replaced with "which transform inputs into outputs", Notes 1, 3, 5 and 6 to entry deleted, Note 2 to entry shortened.]

3.1.30
product
goods or service

[SOURCE: ISO 14024:2018, 3.2]

3.1.31
product category
group of products that can fulfil equivalent functions

[SOURCE: ISO 14025:2006, 3.12]

3.1.32
product category rules
set of specific rules, requirements and guidelines for developing Type II/Type III environmental declarations and/or for quantitative analysis within an ECD process, for one or more product categories

[SOURCE: ISO 14025:2006, 3.5, modified – Abbreviated term "PCR" deleted, "Type II/" and "and/or for quantitative analysis within an ECD process" added.]

3.1.33
product family
subgroup of a product category, technologically or functionally similar products

Note 1 to entry: Basic product families are defined by product standards in IEC 60947 (all parts). Further families can be defined by the manufacturers.

3.1.34
program operator
body or bodies that conduct a Type III environmental declaration program

[SOURCE: ISO 14025:2006, 3.4, modified – Note to entry deleted.]

3.1.35
product specific rules
specific set of rules and requirements applicable to a product family, complementing product category rules for life cycle assessment