SVENSK STANDARD SS-EN 60519-1

Fastställd	Utgåva	Sida	Ansvarig kommitté
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Anläggningar för industriell elvärme och elektromagnetisk materialbehandling – Säkerhet – Del 1: Allmänna fordringar

Safety in installations for electroheating and electromagnetic processing – Part 1: General requirements

Som svensk standard gäller europastandarden EN 60519-1:2015. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60519-1:2015.

Nationellt förord

Europastandarden EN 60519-1:2015

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 60519-1, Fifth edition, 2015 - Safety in installations for electroheating and electromagnetic processing - Part 1: General requirements**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60519-1, utgåva 3, 2011, gäller ej fr o m 2018-04-14.

ICS 25.180.10

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60519-1

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English Version

Safety in installations for electroheating and electromagnetic processing - Part 1: General requirements (IEC 60519-1:2015)

Sécurité dans les installations destinées au traitement électrothermique et électromagnétique - Partie 1: Exigences générales
(IEC 60519-1:2015)

Sicherheit in Elektrowärmeanlagen und Anlagen für elektromagnetische Bearbeitungsprozesse - Teil 1: Allgemeine Anforderungen
(IEC 60519-1:2015)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 60519-1:2015 E

SEK Svensk Elstandard

Foreword

The text of document 27/947/FDIS, future edition 5 of IEC 60519-1, prepared by IEC/TC 27 "Industrial electroheating and electromagnetic processing" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60519-1:2015.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2016-01-14
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2018-04-14

This document supersedes EN 60519-1:2011

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

Endorsement notice

The text of the International Standard IEC 60519-1:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60079 (series)	NOTE	Harmonized as EN 60079 (series).
IEC 60204 (series)	NOTE	Harmonized as EN 60204 (series).
IEC 60335 (series)	NOTE	Harmonized as EN 60335 (series).
IEC 60601 (series)	NOTE	Harmonized as EN 60601 (series).
IEC 60974 (series)	NOTE	Harmonized as EN 60974 (series).
IEC 61140:2001	NOTE	Harmonized as EN 61140:2001.
IEC 61140:2001/A1:2004	NOTE	Harmonized as EN 61140:2001/A1:2006.
IEC 61439 (series)	NOTE	Harmonized as EN 61439 (series).
IEC 62226 (series)	NOTE	Harmonized as EN 62226 (series).
IEC 62271 (series)	NOTE	Harmonized as EN 62271 (series).

IEC 62311	NOTE	Harmonized as EN 62311.
ISO 5349-1:2001	NOTE	Harmonized as EN ISO 5349-1:2001.
ISO 7010	NOTE	Harmonized as EN ISO 7010.
ISO 15265:2004	NOTE	Harmonized as EN ISO 15265:2004.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60071-1	-	Insulation co-ordination - Part 1: Definitions, principles and rules	EN 60071-1	-
IEC 60204-1 (mod)	2005	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	EN 60204-1	2006
+A1	2008		+A1	2009
-	-		+corrigendum Feb.	2010
IEC 60204-11	2000	Safety of machinery - Electrical equipment of machines - Part 11: Requirements for HV equipment for voltages above 1 000 V a.c. or 1 500 V d.c. and not exceeding 36 kV	EN 60204-11	2000
-	-		+corrigendum Feb.	2010
IEC 60228	-	Conductors of insulated cables	EN 60228	-
-	-		+corrigendum May	-
IEC 60335-1:2010/A1:2013	2013		-	-
IEC 60335-1 (mod)	2010	Household and similar electrical appliances - Safety - Part 1: General requirements	EN 60335-1	2012
-	-		+A11	2014
-	-		+AC	2014
IEC 60335-2-24	-	Household and similar electrical appliances - Safety - Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers	EN 60335-2-24	-
IEC 60335-2-89	-	Household and similar electrical appliances - Safety - Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor	EN 60335-2-89	-
-	-		+AC	-
IEC 60364-1 (mod)	2005	Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions	HD 60364-1	2008
IEC 60364-4-41	-	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41	-
-	-		+corrigendum Jul.	-
IEC 60364-4-42	-	Low-voltage electrical installations - Part 4-42: Protection for safety - Protection against thermal effects	HD 60364-4-42	-

IEC 60364-4-44	-	Low-voltage electrical installations - Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	HD 60364-4-442	-
IEC 60364-5-53	-	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control	-	-
IEC 60364-5-54	-	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors	HD 60364-5-54	-
IEC 60398	-	Installations for electroheating and electromagnetic processing - General performance test methods	-	-
IEC 60417	-	Graphical symbols for use on equipment	-	-
IEC 60445	-	Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals, conductor terminations and conductors	EN 60445	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 60664-1	-	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	-
IEC 60825-1	-	Safety of laser products - Part 1: Equipment classification and requirements	EN 60825-1	-
IEC 60865-1	-	Short-circuit currents - Calculation of effects - Part 1: Definitions and calculation methods	EN 60865-1	-
IEC 60909-0	-	Short-circuit currents in three-phase a.c. systems - Part 0: Calculation of currents	EN 60909-0	-
IEC 60990	1999	Methods of measurement of touch current and protective conductor current	EN 60990	1999
IEC 61000-3-3	-	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current 16 A per phase and not subject to conditional connection	EN 61000-3-3	-
IEC 61000-3-11	-	Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current <= 75 A and subject to conditional connection	EN 61000-3-11	-
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments	EN 61000-6-2	-
-	-		+corrigendum Sep.	-
IEC 61000-6-4	-	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments	EN 61000-6-4	-
IEC 61010-1	2010	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	EN 61010-1	2010
IEC 61082-1	-	Preparation of documents used in electrotechnology - Part 1: General requirements	EN 61082-1	-

IEC 61310	series	Safety of machinery - Indication, marking and actuation	EN 61310	series
IEC 61326-3-1	-	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) - General industrial applications	EN 61326-3-1	-
IEC 61508	series	Functional safety of electrical/electronic/programmable electronic safety-related systems	EN 61508	series
IEC 61672-1	-	Electroacoustics - Sound level meters - Part 1: Specifications	EN 61672-1	-
IEC 61672-2	-	Electroacoustics - Sound level meters - Part 2: Pattern evaluation tests	EN 61672-2	-
IEC 61786-1	-	Measurement of DC magnetic, AC magnetic and AC electric fields from 1 Hz to 100 kHz with regard to exposure of human beings - Part 1: Requirements for measuring instruments	EN 61786-1	-
IEC 61786-2	-	Measurement of low-frequency magnetic and electric fields with regard to exposure of human beings - Part 2: Guidance for measurements	-	-
IEC 61936-1	-	Power installations exceeding 1 kV a.c. - Part 1: Common rules	EN 61936-1	-
-	-		+AC	-
-	-		+AC	-
-	-		+AC	-
IEC 62061	-	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN 62061	-
-	-		+corrigendum Feb.	-
IEC 62471 (mod)	2006	Photobiological safety of lamps and lamp systems	EN 62471	2008
IEC 82079-1	-	Preparation of instructions for use - Structuring, content and presentation - Part 1: General principles and detailed requirements	EN 82079-1	-
IEC Guide 104	-	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-
ISO 3746	-	Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Survey method using an enveloping measurement surface over a reflecting plane	EN ISO 3746	-
ISO 3864-1	-	Graphical symbols - Safety colours and safety signs - Part-1: Design principles for safety signs and safety markings	-	-
ISO 6385	-	Ergonomic principles in the design of work systems	EN ISO 6385	-
ISO 7000	-	Graphical symbols for use on equipment - Registered symbols	-	-
ISO 12100	2010	Safety of machinery - General principles for design - Risk assessment and risk reduction	EN ISO 12100	2010

ISO 13577-1	-	Industrial furnaces and associated processing equipment - Safety - Part 1: General requirements	-	-
ISO 13577-2	-	Industrial furnaces and associated processing equipment - Safety - Part 2: Combustion and fuel handling systems	-	-
ISO 13732-1	-	Ergonomics of the thermal environment - Methods for the assessment of human responses to contact with surfaces - Part 1: Hot surfaces	EN ISO 13732-1	-
ISO 13849	series	Safety of machinery - Safety-related parts of control systems	EN ISO 13849	series
ISO 13850	-	Safety of machinery - Emergency stop - Principles for design	EN ISO 13850	-
ISO 13855	-	Safety of machinery - Positioning of safeguards with respect to the approach speeds of parts of the human body	EN ISO 13855	-
ISO 13857	-	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs	EN ISO 13857	-
ISO 14119	-	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection	-	-
ISO 14120	-	Safety of machinery – Guards - General requirements for the design and construction of fixed and movable guards	-	-
ISO 14159	-	Safety of machinery - Hygiene requirements for the design of machinery	EN ISO 14159	-
ISO 19353	-	Safety of machinery - Fire prevention and protection	-	-
IEC/TR 61000-3-6	-	Electromagnetic compatibility (EMC) - Part 3-6: Limits - Assessment of emission limits for the connection of distorting installations to MV, HV and EHV power systems	-	-
IEC/TS 61000-3-5	-	Electromagnetic compatibility (EMC) - Part 3-5: Limits - Limitation of voltage fluctuations and flicker in low-voltage power supply systems for equipment with rated current greater than 75 A	-	-
ISO/IEC Guide 51	-	Safety aspects - Guidelines for their inclusion in standards	-	-
CISPR 11	-	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY IN INSTALLATIONS FOR ELECTROHEATING AND ELECTROMAGNETIC PROCESSING –

Part 1: General requirements

FOREWORD

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International Standard IEC 60519-1 has been prepared by IEC technical committee 27: Industrial electroheating and electromagnetic processing.

This fifth edition cancels and replaces the fourth edition published in 2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) The title and scope of the standard has been expanded to include installations and equipment for electromagnetic processing of materials.
b) Terms and definitions as well as the list of normative references have been updated and completed with new items.
c) The requirements have been restructured.

d) Additional requirements for electric and magnetic fields, for touch currents as well as for optical radiation have been added.

e) New clauses addressing verification have been added.

f) New annexes specifying limits of exposure hazards for electric and magnetic fields, optical radiation, noise and vibration have been added.

g) New annexes on EMC, markings and warnings, guidelines for using this standard and information on the connection to ISO 13577-1 have been added.

The text of this standard is based on the following documents:

FDIS	Report on voting
27/947/FDIS	27/951/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60519 series, published under the general title *Safety in installations for electroheating and electromagnetic processing*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

In this standard, the following print types are used:

– requirements and definitions: in roman type;

– NOTES: in smaller roman type;

– terms used throughout this standard which have been defined in Clause 3: **in bold type**.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This fifth edition of IEC 60519-1 is a product safety publication and is intended to:

– include all types of installations or equipment that are in the scope of IEC TC 27 dealing with industrial **electroheating** (**EH**) and **electromagnetic processing of materials** (**EPM**);

– cover in these General Requirements all hazards that are relevant for more than one type of equipment or installation individually dealt with in Particular Requirements;

– give requirements on electrical safety, touch currents, electric fields, magnetic fields and radiation, thus mirroring the broad scope of installations covered and their processing frequency;

– give means for verification of the requirements;

– make extensive use of the standards developed by IEC committees with horizontal or group safety functions and of relevant ISO standards by reference, including publications developed by ISO/TC 244 (more information is given in Annex H), in compliance with IEC Guide 104;

– be useable like a type-C standard in the sense of ISO 12100;

– include all material, references and requirements suitable for risk assessment and list significant hazards.

This standard adresses mainly **manufacturers** making made-to-order equipment on a single project base. The **manufacturer** is well aware that it is his responsibility to make equipment safe through adequate risk reduction and it is the responsibility of the **user** to assess exposure of the **operator** in line with applicable health and safety regulations. Looking at projects providing single pieces of equipment or single installations, this clear division of responsibilities tends to blur, caused by inter alia

– development of the process (**normal operation**) through the **manufacturer** and **user**,

– shared definition of working procedures for the **operator** by the **manufacturer** and **user**,

– the scope of delivery often including all protective means,

– individual sales contracts where **users** require an assessment of exposure through the **manufacturer**.

Thus this standards provides information on exposure hazards and limits where relevant, well aware that this is exceeding the scope of a product standard.

SAFETY IN INSTALLATIONS FOR ELECTROHEATING AND ELECTROMAGNETIC PROCESSING –

Part 1: General requirements

1 Scope and object

1.1 Scope

This part of IEC 60519 specifies general safety requirements for industrial installations or equipment intended for **electroheating** (**EH**) and **electroheating** based treatment technologies as well as for **electromagnetic processing of materials** (**EPM**).

The requirements are applicable to industrial installations or equipment with the possible use as:

– equipment for direct and indirect resistance heating,
– equipment for electric resistance trace heating,
– equipment for induction heating,
– equipment using the effect of electromagnetic forces on materials,
– equipment for arc heating, including submerged arc heating,
– equipment for electroslag remelting,
– equipment for plasma heating and plasma surface treatment,
– equipment for microwave heating,
– equipment for dielectric heating,
– equipment using electron guns,
– equipment for infrared radiation heating,
– equipment for laser heating.

NOTE The list presents typical examples of equipment and its applications and is not exhaustive.

The overall safety requirements for the various types of **EH** or **EPM equipment** and **installations** result from the joint application of the General Requirements specified in this standard and Particular Requirements covering specific types of installations or equipment (guidelines are given in Annex G). If no Particular Requirement is covering a specific installation or equipment, the General Requirements are applicable as such.

This standard does not apply to equipment and appliances within the scope of:

– IEC 60079 series – i.e. equipment or installations intended for use in potentially explosive atmospheres;
– IEC 60335 series, – i.e. household, commercial and similar electrical appliances, including room heating;
– IEC 60601 series – i.e. medical electrical equipment,
– IEC 60974 series – i.e. arc welding equipment,
– IEC 61010 series – i.e. equipment for laboratory use.

1.2 Object

The requirements refer to the complete life cycle of the installation or equipment from design through commissioning, operation, maintenance, inspection, to decommissioning. They cover

the safety of persons and protection of the environment during **normal operation** and under single-fault condition.

This standard presumes that the installation or equipment is operated and maintained only by personnel consisting of **skilled** or **instructed persons**.

This standard is intended for verifying that the **EH** or **EPM equipment** or **installation** meets the requirements of this standard through design, site acceptance tests, routine tests or inspection.

This standard is not providing requirements for type testing.

NOTE Industrial equipment covered by this standard is typically produced as a single unit or a very small number of units.

2 Normative references

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

IEC 60071-1, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60204-1:2005, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements*
IEC 60204-1:2005/AMD1:2008

IEC 60204-11:2000, *Safety of machinery – Electrical equipment of machines – Part 11: Requirements for HV equipment for voltages above 1 000 V a.c. or 1 500 V d.c. and not exceeding 36 kV*

IEC 60228, *Conductors of insulated cables*

IEC 60335-1:2010, *Household and similar electrical appliances – Safety – Part 1: General requirements*
IEC 603355-1:2010/AMD1:2013

IEC 60335-2-24, *Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers*

IEC 60335-2-89, *Household and similar electrical appliances – Safety – Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant unit or compressor*

IEC 60364-1:2005, *Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 60364-4-41, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-42, *Low-voltage electrical installations – Part 4-42: Protection for safety – Protection against thermal effects*

IEC 60364-4-44, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60364-5-53, *Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control*

IEC 60364-5-54, *Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors*

IEC 60398:—[1], *Installations for electroheating and electromagnetic processing – General performance test methods*

IEC 60417, *Graphical symbols for use on equipment* (available from: http://www.graphical-symbols.info/equipment)

IEC 60445, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60865-1, *Short-circuit currents – Calculation of effects – Part 1: Definitions and calculation methods*

IEC 60909-0, *Short-circuit currents in three-phase a.c. systems – Part 0: Calculation of currents*

IEC 60990:1999, *Methods of measurement of touch current and protective conductor current*

IEC 61000-3-3, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection*

IEC TS 61000-3-5, *Electromagnetic compatibility (EMC) – Part 3-5: Limits – Limitation of voltage fluctuations and flicker in low-voltage power supply systems for equipment with rated current greater than 75 A*

IEC TR 61000-3-6, *Electromagnetic compatibility (EMC) – Part 3-6: Limits – Assessment of emission limits for the connection of distorting installations to MV, HV and EHV power systems*

IEC 61000-3-11, *Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems – Equipment with rated current ≤ 75 A and subject to conditional connection*

IEC 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*

IEC 61000-6-4, *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments*

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[1] To be published.

IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

IEC 61082-1, *Preparation of documents used in electrotechnology – Part 1: Rules*

IEC 61310 (all parts), *Safety of machinery – Indication, marking and actuation*

IEC 61326-3-1, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications*

IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

IEC 61672-1, *Electroacoustics – Sound level meters – Part 1: Specifications*

IEC 61672-2, *Electroacoustics – Sound level meters – Part 2: Pattern evaluation tests*

IEC 61786-1, *Measurement of DC magnetic, AC magnetic and AC electric fields from 1 Hz to 100 kHz with regard to exposure of human beings – Part 1: Requirements for measuring instruments*

IEC 61786-2[2] *Measurement of DC magnetic fields, AC magnetic and electric fields from 1 Hz to 100 kHz with regard to exposure of human beings – Guidance for measurements*

IEC 61936-1, *Power installations exceeding 1 kV a.c. – Part 1: Common rules*

IEC 62061, *Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems*

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

IEC 82079-1, *Preparation of instructions for use – Structuring, content and presentation – Part 1: General principles and detailed requirements*

CISPR 11, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*

IEC Guide 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC Guide 51, *Safety aspects — Guidelines for their inclusion in standards*

ISO 3746, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Survey method using an enveloping measurement surface over a reflecting plane*

ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings*

ISO 6385, *Ergonomic principles in the design of work systems*

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2 To be published.

ISO 7000, *Graphical symbols for use on equipment – Registered symbols*

ISO 12100:2010, *Safety of machinery – General principles for design – Risk assessment and risk reduction*

ISO 13577-1, *Industrial furnaces and associated processing equipment – Safety – Part 1: General requirements*

ISO 13577-2, *Industrial furnaces and associated processing equipment – Safety – Part 2: Combustion and fuel handling systems*

ISO 13732-1*, Ergonomics of the thermal environment – Methods for the assessment of human responses to contact with surfaces – Part 1: Hot surfaces*

ISO 13849 (all parts), *Safety of machinery – Safety-related parts of control systems*

ISO 13850, *Safety of machinery – Emergency stop – Principles for design*

ISO 13855, *Safety of machinery – Positioning of safeguards with respect to the approach speeds of parts of the human body*

ISO 13857, *Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 14119, *Safety of machinery – Interlocking devices associated with guards – Principles for design and selection*

ISO 14120, *Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards*

ISO 14159, *Safety of machinery – Hygiene requirements for the design of machinery*

ISO 19353, *Safety of machinery – Fire prevention and protection*