INTERNATIONAL STANDARD

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Safety in electroheat installations–

Part 1:
General requirements

Sécurité dans les installations électrothermiques –

Partie 1:
Exigences générales

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY IN ELECTROHEAT INSTALLATIONS –

Part 1: General requirements

FOREWORD

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

This third edition cancels and replaces the second edition published in 1984. It constitutes a technical revision.

In this third edition of IEC 60519-1 significant technical changes with respect to the previous edition are as follows:

- the scope is now extended to cover also voltage band 3 equipment with rated voltage not exceeding 3 600 V a.c. or 5 000 V d.c.; the relevant provisions for such equipment have been added in clauses on, for example protection against electric shock, equipotential bonding or maintenance work;
- requirements concerning equipotential bonding have been essentially modified and introduced in a separate clause, based on the actual relevant provisions of IEC 60204-1;
- general provisions on the impact of electromagnetic effects have been given;
- information concerning technical documentation has been modified;
- a bibliography has been added.

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

FDIS	Report on voting
27/358/FDIS	27/377/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.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

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- withdrawn;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

IEC 60519 consists of the following parts, under the general title *Safety in electroheat installations:*

Part 1: General requirements

Part 2: Particular requirements for resistance heating equipment

Part 3: Particular requirements for induction and conduction heating and induction melting installations

Part 4: Particular requirements for arc furnace installations

Part 5: Specifications for safety in plasma installations

Part 6: Specifications for safety in industrial microwave heating equipment

Part 7: Particular requirements for installations with electron guns

Part 8: Particular requirements for electroslag remelting furnaces

Part 9: Particular requirements for high-frequency dielectric heating installations

Part 10: Particular requirements for electrical resistance trace heating systems for industrial and commercial applications[1]

Part 11: Particular requirements for installations for electromagnetic stirring, transport or pouring of metal liquids

Part 21: Particular requirements for resistance heating equipment – Heating and melting glass equipment

NOTE If necessary, additional parts covering particular industrial electroheat equipment may be considered.

General test methods for industrial electroheating installations are specified in IEC 60398.

Additional information on non-electrical hazards possibly arising from the utilization of industrial electroheat equipment may be taken from European Standard EN 746-1 (see Bibliography), which specifies common safety requirements for industrial thermoprocessing equipment, as well as of an electrical and of a non-electrical kind.

A bilingual version of this standard may be issued at a later date.

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[1] Under consideration.

SAFETY IN ELECTROHEAT INSTALLATIONS –

Part 1: General requirements

1 General

1.1 Scope

This part of IEC 60519 is applicable to industrial electroheat installations, which may comprise electroheat equipment in the voltage range up to 3 600 V a.c. or 5 000 V d.c., and deals with the general safety requirements.

Where requirements given in this standard differ from those given in other IEC publications, an equivalent degree of safety shall be ensured.

The present requirements apply to industrial electroheat and associated treatment installations such as:

– direct arc furnaces;
– submerged arc furnaces;
– equipment for arc heating (other than arc furnaces);
– electroslag remelting furnaces;
– plasma equipment;
– induction melting furnaces;
– equipment for induction heating;
– equipment for direct resistance heating;
– equipment for indirect resistance heating;
– equipment for infra-red radiation heating;
– equipment for dielectric heating;
– equipment with electron guns;
– microwave heating equipment;
– industrial laser equipment;
– electroheat surface treatment equipment.

NOTE The list is intended to present some typical examples of installations covered by this standard. It is not exhaustive.

This standard is not applicable to electric cooking and heating equipment for household or welding purposes, nor does it apply to space heating of any kind.

This standard refers to the normal operation of industrial electroheat installations; it is also intended to ensure the safety of persons in the case of abnormal operation and when faults occur in electroheat installations. Inspection, commissioning, utilization and maintenance are dealt with in Clause 16.

This standard assumes that the installations are operated and maintained by skilled or instructed persons according to 3.1.8 and 3.1.9.

1.2 Object

The requirements for the safety of persons in electroheat installations are the subject, on the one hand, of general requirements applicable to electroheat installations as a whole and, on the other hand, of particular requirements applicable to each of them. This standard gives only general requirements.

These safety requirements concern the protection of persons against dangers of particularly electrical origin and also against certain dangers of non-electrical origin.

The safety requirements to be observed result from the joint application of general requirements and particular requirements concerning the specific industrial application of the electroheat. Where particular requirements exist they shall complete, modify or replace the general requirements. In the absence of particular requirements, the requirements to be complied with are those, which are specified in this standard.

In addition, for electroheat installations of voltage bands 1 and 2 and frequencies of up to 60 Hz, the following parts of IEC 60364 shall apply: IEC 60364-1, IEC 60364-4-41, IEC 60364-4-42, IEC 60364-4-43, IEC 60364-5-53, IEC 60364-5-54.

For voltage band 3, electroheat equipment with rated voltage not exceeding 3 600 V a.c. or 5 000 V d.c., special requirements shall be complied with. Such requirements are specified in this standard. For rated voltage exceeding 3 600 V a.c. or 5 000 V d.c., additional specifications are under consideration.

In addition, for electrical equipment of up to 1 000 V a.c. or 1 500 V d.c. and frequencies of up to 200 Hz, IEC 60204-1 may be taken as a guidance. IEC 60204-1 however does not cover power circuits.

2 Normative references

The following referenced documents are indispensable for the application 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 60050-195:1998, *International Electrotechnical Vocabulary (IEV) – Part 195: Earthing and protection against electric shock*
Amendment 1(2001)

IEC 60050-521:2002, *International Electrotechnical Vocabulary (IEV) – Part 521: Semiconductor devices and integrated circuits*

IEC 60050-826:1982, *International Electrotechnical Vocabulary (IEV) – Part 826: Electrical installations of buildings*
Amendment 1(1990), Amendment 2(1995) and Amendment 3(1999)

IEC 60050-841:1983, *International Electrotechnical Vocabulary (IEV) – Part 841: Industrial electroheating*

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

IEC 60110-1:1998, *Power capacitors for induction heating installations – Part 1: General*

IEC 60204-1:1997, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements* [2]

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[2] There is a consolidated edition 4.1 (2000) that includes IEC 60204-1 (1997) and its amendment 1 (1999).

IEC 60364-1, *Electrical installations of buildings – Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 60364-4-41, *Electrical installations of buildings – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-42, *Electrical installations of buildings – Part 4-42: Protection for safety – Protection against thermal effects*

IEC 60364-4-43, *Electrical installations of buildings – Part 4-43: Protection for safety – Protection against overcurrent*

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, *Electrical installations of buildings – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements, protective conductors and protective bonding conductors*

IEC 60417-DB[3], *Graphical symbols for use on equipment*

IEC 60446, *Basic and safety principles for man-machine interface, marking and identification – Identification of conductors by colours or numerals*

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* [4]

CISPR 11, *Industrial, scientific and medical (ISM) radio-frequency equipment – Electro-magnetic disturbance characteristics – Limits and methods of measurement*

ISO 7000, *Graphical symbols for use on equipment – Index and synopsis*

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3 DB refers to the IEC on-line database.

4 There is a consolidated edition 1.2 (2002) that includes IEC 60664-1 (1992) and its amendment 1 (2000) and amendment 2 (2002).