

**Ohutus elekterkuumutuspaigaldistes.
Osa 11: Erinõuded vedelmetallide
elektromagnetilise segamise, transpordi
ja valamise paigaldistele**

Safety in electroheat installations -- Part 11:
Particular requirements for installations using the
effect of electromagnetic forces on liquid metals

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60519-11:2007 sisaldab Euroopa standardi EN 60519-11:2007 ingliskeelset teksti. Käesolev dokument on jõustatud 23.11.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 60519-11:2007 consists of the English text of the European standard EN 60519-11:2007. This document is endorsed on 23.11.2007 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.
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Käsitlusala: This part of IEC 60519 applies to installations predominantly using the effect of electromagnetic forces on liquid metals: – installations for electromagnetic (induction) stirring or transport of liquid metals at low frequencies; – installations that influence the pouring process by an electromagnetic field; – parts directly affected by the electromagnetic stirring, transport or pouring installation.	Scope: This part of IEC 60519 applies to installations predominantly using the effect of electromagnetic forces on liquid metals: – installations for electromagnetic (induction) stirring or transport of liquid metals at low frequencies; – installations that influence the pouring process by an electromagnetic field; – parts directly affected by the electromagnetic stirring, transport or pouring installation.
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ICS 25.180.10

Võtmesõnad: electroheat installation, electromagnetic pouring, liquid metal, safety, stirring

English version

**Safety in electroheat installations -
Part 11: Particular requirements for installations
using the effect of electromagnetic forces on liquid metals
(IEC 60519-11:2007)**

Sécurité dans les installations
électrothermiques -
Partie 11: Exigences particulières
pour les installations utilisant l'effet
des forces électromagnétiques
sur les métaux liquides
(CEI 60519-11:2007)

Sicherheit in Elektrowärmeanlagen -
Teil 11: Besondere Anforderungen
an Anlagen, die die Wirkung
elektromagnetischer Kräfte
auf flüssige Metalle nutzen
(IEC 60519-11:2007)

This European Standard was approved by CENELEC on 2007-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 27/577/FDIS, future edition 2 of IEC 60519-11, prepared by IEC TC 27, Industrial electroheating equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60519-11 on 2007-09-01.

This European Standard supersedes EN 60519-11:1997.

The significant changes with respect to EN 60519-11:1997 are as follows:

- EN 60519-1:2003 and EN 60519-3:2005 have been taken into account;
- definitions have been brought into line with IEC 60050-841:2004.

This standard is to be used in conjunction with EN 60519-1:2003. It is intended to specify particular requirements for installations using the effect of electromagnetic forces on liquid metals.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2008-06-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2010-09-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60519-11:2007 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-841	2004	International Electrotechnical Vocabulary - Part 841: Industrial electroheat	-	-
IEC 60110-1	1998	Power capacitors for induction heating installations - Part 1: General	EN 60110-1	1998
IEC 60143-1	2004	Series capacitors for power systems - Part 1: General	EN 60143-1	2004
IEC 60364-4-41 (mod)	2005	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41 + corr. July	2007 2007
IEC 60519-1	2003	Safety in electroheat installations - Part 1: General requirements	EN 60519-1	2003
CISPR 11 (mod)	- ¹⁾	Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement	EN 55011	2007 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

INTERNATIONAL
STANDARD

IEC
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INTERNATIONALE

60519-11

Second edition
Deuxième édition
2007-06

Safety in electroheat installations –

**Part 11:
Particular requirements for installations using the
effect of electromagnetic forces on liquid metals**

Sécurité dans les installations électrothermiques –

**Partie 11:
Exigences particulières pour les installations
utilisant l'effet des forces électromagnétiques
sur les métaux liquides**



Reference number
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IEC/CEI 60519-11:2007



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CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	6
4 Inductor	7
5 Capacitors	7
6 Mains-frequency power sources	8
7 Solid-state frequency converters	8
8 Switchgear.....	9
9 Cables, wires and busbars	9
10 Liquid cooling	10
11 Rating plate	10
12 Clearance and creepage distances	11
13 Protection against electric shock.....	11
13.1 Protection against direct contact	11
13.1.1 Permissible touch voltage as a function of frequency.....	11
13.1.2 Accessibility of electrical equipment	11
13.1.3 Accessible plugs and sockets.....	11
13.1.4 Special requirements for live conductors at voltage bands 2 and 3	11
13.2 Protection against indirect contact	12
13.2.1 Permissible touch voltage as a function of duration and frequency.....	12
13.2.2 Electrical insulation resistance	12
13.3 Special requirements	12
13.4 Earthing provisions	13
13.5 Protective conductors	13
14 Radio interferences.....	14
15 Operation instructions	14
Annex A (normative) Specific requirements for electromagnetic pouring equipment	15
Annex B (normative) Specific requirements for electromagnetic equipment with lining.....	16

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY IN ELECTROHEAT INSTALLATIONS –**Part 11: Particular requirements for installations using the effect of electromagnetic forces on liquid metals**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60519-11 has been prepared by IEC technical committee 27: Industrial electroheating equipment.

This second edition cancels and replaces the first edition published in 1997 and constitutes a technical revision. The significant changes with respect to the previous edition are as follows:

- the latest editions of IEC 60519-1:2003 and IEC 60519-3:2005 have been taken into account;
- definitions have been brought into line with the second edition of IEC 60050-841:2004.

This standard is to be used in conjunction with IEC 60519-1:2003. It is intended to specify particular requirements for installations using the effect of electromagnetic forces on liquid metals.

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

FDIS	Report on voting
27/577/FDIS	27/585/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 list of all parts of the IEC 60519 series, under the general title *Safety in electroheat installations*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

SAFETY IN ELECTROHEAT INSTALLATIONS –

Part 11: Particular requirements for installations using the effect of electromagnetic forces on liquid metals

1 Scope

This part of IEC 60519 applies to installations predominantly using the effect of electromagnetic forces on liquid metals:

- installations for electromagnetic (induction) stirring or transport of liquid metals at low frequencies;
- installations that influence the pouring process by an electromagnetic field;
- parts directly affected by the electromagnetic stirring, transport or pouring installation.

Examples of application:

- stirring devices for casting machines, arc furnaces, ladles, etc.;
- transport of liquid metal for emptying or filling furnaces, launders or moulds;
- devices to transport liquid metal with simultaneous proportioning of the transported quantity, for example, for filling diecasting machines;
- influencing the ingot surface or the pouring stream enhancing crystallization by means of an electromagnetic field during continuous casting;
- sealing of mechanical gaps of melt vessels, for example, in vertical galvanizing line.

This standard consists of

- requirements common to installations using the effect of electromagnetic forces on liquid metals;
- specific requirements for electromagnetic pouring equipment (Annex A);
- specific requirements for electromagnetic equipment with lining (Annex B).

NOTE When applying IEC 60519-1 in conjunction with this standard, the terms "electroheat installation" or "electroheat device" should be replaced by the term "installation using the effect of electromagnetic forces on liquid metals".

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 60050-841:2004, *International Electrotechnical Vocabulary – Part 841: Industrial electroheat*

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

IEC 60143-1:2004, *Series capacitors for power systems – Part 1: General*

IEC 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60519-1:2003, *Safety in electroheat installations – Part 1: General requirements*

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

3 Terms and definitions

For the purpose of this document, the terms and definitions given in IEC 60519-1 and IEC 60050-841 (some of which are repeated here), as well as the following apply.

3.1

installation using the effect of electromagnetic forces on liquid metals

installation composed of the inductor and the electric and mechanical equipment used to exercise an intended effect of electromagnetic forces on liquid metals

3.2

electromagnetic stirring of liquid metals

procedure to achieve stirring motion in liquid metals by using an electromagnetic field

[IEV 841-27-24, modified]

3.3

electromagnetic transport of liquid metals

procedure to move liquid metals in a defined direction using an electromagnetic field

[IEV 841-27-25, modified]

3.4

electromagnetic casting of liquid metals

procedure to shape the liquid metal stream or to influence its surface quality after pouring by the use of an electromagnetic field

[IEV 841-27-26]

3.5

enhancing crystallization of liquid metal in electromagnetic fields

procedure to shape a form and structure of metal crystals in an electromagnetic field

[IEV 841-27-27]

3.6

inductor

part of an installation (for example, coil(s)) using the effect of electromagnetic forces on liquid metals which produces the electromagnetic field to yield the required electrodynamic force

NOTE Inductor is defined in IEV 841-27-47, but for the purpose of this standard this more specific definition is needed.