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Safety in installations for electroheating and  
electromagnetic processing - Part 12: Particular  
requirements for infrared electroheating

## EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN IEC 60519-12:2018 sisaldab Euroopa standardi EN IEC 60519-12:2018 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 60519-12:2018 consists of the English text of the European standard EN IEC 60519-12:2018.
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English Version

**Safety in installations for electroheating and electromagnetic  
processing - Part 12: Particular requirements for infrared  
electroheating  
(IEC 60519-12:2016)**

Sécurité dans les installations destinées au traitement  
électrothermique et électromagnétique - Partie 12:  
Exigences particulières pour chauffage électrique par  
rayonnement infrarouge  
(IEC 60519-12:2016)

Sicherheit in Elektrowärmeanlagen und Anlagen für  
elektromagnetische Bearbeitungsprozesse - Teil 12:  
Besondere Anforderungen an Infrarot-Elektrowärmeanlagen  
(IEC 60519-12:2016)

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## European foreword

The text of document 27/967/CDV, future edition 2 of IEC 60519-12, prepared by IEC/TC 27 "Industrial electroheating and electromagnetic processing" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60519-12:2018.

The following dates are fixed:

- latest date by which the document has to be (dop) 2018-09-02  
implemented at national level by  
publication of an identical national  
standard or by endorsement
- latest date by which the national (dow) 2021-03-02  
standards conflicting with the  
document have to be withdrawn

This document supersedes EN 60519-12:2013.

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## Endorsement notice

The text of the International Standard IEC 60519-12:2016 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 60519-2:2006	NOTE	Harmonized as EN 60519-2:2006 (not modified).
IEC 60825-1:2014	NOTE	Harmonized as EN 60825-1:2014 (not modified).
IEC 61010-1:2010	NOTE	Harmonized as EN 61010-1:2010 (not modified).

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where 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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60519-1	2015	Safety in installations for electroheating and electromagnetic processing -- Part 1: General requirements	EN 60519-1	2015

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## INTRODUCTION

The scope of this standard covers a broad range of types and designs of infrared equipment which are used for many different purposes. This standard is intended to cover all industrial infrared equipment types, with some few exceptions provided in Clause 1.

Many other types of electroheating equipment emit infrared radiation of hazardous levels, therefore IEC 60519-1:2015 provides all general requirements addressing optical radiation and this document provides specific considerations for infrared equipment and helpful methods.

With reference to IEC 60519-2:2006 it has been agreed in TC 27 that this standard covers all kinds of infrared emission hazards of industrial electroheating installations and provisions not given in IEC 60519-1:2015.

The discussion of infrared radiation assessment has become quite detailed in this standard, as for the industry there is not any single useful source available for simple, versatile, easy to use and cost effective measurement methods.

The other principles for covering the risks caused by infrared radiation were:

- the manufacturer usually does not employ an expert in optical radiation measurement or has access to an optical laboratory with all the necessary equipment needed for elaborate measurements;
- operating staff with limited experience in radiation measurement is usually responsible for the task of performing the necessary measurements and will appreciate a simple and easy to follow guide;
- the scope of IEC 62471:2006 is limited to lamps but is applicable for other light sources. Therefore, core aspects were adapted from that standard and if possible simplified for this document.
- figures illustrating the classes defined in IEC 62471:2006 and listed in IEC 60519-1:2015 are included;
- relevant documents of American National Standard Institute/Illuminating Engineering Society of North America, the ANSI/IESNA RP 27 series, are based on the ICNIRP recommendations as well. They provide no extra or contradictory material with regard to this standard and its references.



## SAFETY IN INSTALLATIONS FOR ELECTROHEATING AND ELECTROMAGNETIC PROCESSING –

### Part 12: Particular requirements for infrared electroheating

#### 1 Scope and object

##### 1.1 Scope

This clause of Part 1 is replaced by the following.

*Replacement:*

This part of IEC 60519 specifies safety requirements for industrial electroheating equipment and installations in which infrared radiation – usually generated by infrared emitters – is significantly dominating over heat convection or heat conduction as means of energy transfer to the workload. A further limitation of the scope is that the infrared emitters have a maximum spectral emission at longer wavelengths than 780 nm in air or vacuum, and are emitting wideband continuous spectra such as by thermal radiation or high pressure arcs.

IEC 60519-1:2015 defines infrared as radiation within the frequency range between 400 THz and 300 GHz. This corresponds to a wavelength range between 780 nm and 10 µm in vacuum. Industrial infrared heating commonly uses thermal infrared sources with rated temperatures between 500 °C and 3 000 °C; the emitted radiation from these sources dominates in the wavelength range between 780 nm and 10 µm.

Since substantial emission of thermal emitters can extend either to wavelengths below 780 nm or above 3 000 nm, the safety aspects of emitted visible light and emission at wavelengths longer than 3 000 nm are also considered in this document.

This standard is not applicable to:

- infrared installations with lasers or light-emitting diodes (LEDs) as main sources – they are covered by IEC 62471:2006 and IEC 60825-1:2014;
- appliances for use by the general public;
- appliances for laboratory use – they are covered by IEC 61010-1:2010;
- electroheating installations where resistance heated bare wires, tubes or bars are used as heating elements, and infrared radiation is not a dominant side effect of the intended use, covered by IEC 60519-2:2006;
- infrared heating equipment with a nominal combined electrical power of the infrared emitters of less than 250 W;
- handheld infrared equipment.

Industrial infrared electroheating equipment under the scope of this standard typically uses the Joule effect for the conversion of electric energy into infrared radiation by one or several sources. Radiation is then emitted from one or several elements onto the material to be treated. Such infrared heating elements are in particular:

- thermal infrared emitters in the form of tubular, plate-like or otherwise shaped ceramics with a resistive element inside;
- infrared quartz glass tube or halogen lamp emitters with a hot filament as a source;