

**Industrial electroheating equipment - Test methods for
direct arc furnaces**

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English version

**Industrial electroheating equipment -
Test methods for direct arc furnaces
(IEC 60676:2011)**

Chauffage électrique industriel -
Méthodes d'essai des fours à arc direct
(CEI 60676:2011)

Industrielle Elektrowärmeanlagen -
Prüfverfahren für Lichtbogen-Schmelzöfen
(IEC 60676:2011)

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 27/816/FDIS, future edition 3 of IEC 60676, prepared by IEC/TC 27 "Industrial electroheating" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60676:2012.

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) 2012-09-13
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2014-12-13

This document supersedes EN 60676:2002.

EN 60676:2012 includes the following significant technical changes with respect to EN 60676:2002:

- Clause 1 (*Scope and object*) – types of furnaces are more clearly defined.
- Clause 2 (*Normative references*) and Clause 3 (*Terms and definitions*) have been updated and completed.
- New Clause 4 (*Features of the EAFsystem*) has been added; it mainly concentrates on the tests necessary for high-voltage / high-current electrical equipment in the installation.
- Clause 5 (*Type of tests and general conditions of their performance*) and Clause 6 (*Technical tests*) have been modified according to today's requirements for safe operation of an EAF.

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.

Endorsement notice

The text of the International Standard IEC 60676:2011 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:

- [2] IEC 60146-1-1:2009 NOTE Harmonized as EN 60146-1-1:2010 (not modified).
- [3] IEC 60683:2011 NOTE Harmonized as EN 60683:2012 (not modified).

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 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 60398	1999	Industrial electroheating installations - General test methods	EN 60398	1999
IEC 60519-1	-	Safety in electroheating installations - Part 1: General requirements	EN 60519-1	-
IEC 60519-4	-	Safety in electroheat installations - Part 4: Particular requirements for arc furnace installations	EN 60519-4	-

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INDUSTRIAL ELECTROHEATING EQUIPMENT – TEST METHODS FOR DIRECT ARC FURNACES

1 Scope and object

This International Standard specifies test procedures, conditions and methods according to which the main parameters and the main operational characteristics of electric arc furnaces (EAF) operated either with alternating current (EAFac) or with direct current (EAFdc) with a capacity above 500 kg/heat are established.

The EAF technology is also applicable to furnaces, in which liquid metal is kept at high temperature or superheated to casting temperature (e.g. in a ladle furnace (LF), operated with alternating current).

Test methods for some special equipment, e.g. controlled rectifiers for EAFdc, are covered by IEC 60146-1-1.

Test methods for submerged arc furnaces (SAF) are covered by IEC 60683.

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 60398:1999, *Industrial electroheating installations – General test methods*

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

IEC 60519-4, *Safety in electroheat installations – Part 4: Particular requirements for arc furnace installations*

3 Terms and definitions

For the purposes of this document the terms and definitions given in IEC 60519-1:2010 and the following apply.

NOTE Refer to International Electrotechnical Vocabulary, IEC 600500, for general definitions. Terms relating to industrial electroheat are defined in IEC 60050-841.

3.1

active power

P

mean value of the instantaneous power *p* (in kW) taken under periodic conditions over one period of time *T* (in h):

$$P = \frac{1}{T} \int_0^T p \, dt$$

NOTE Active power instantaneous value (r.m.s.) measured at any time, including all phases.

[IEC 60050-131:2002, 131-11-42, modified]