SLOVENSKI STANDARD
SIST EN 60676:2002

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Industrial electroheating equipment - Test methods for direct arc furnaces

Industrial electroheating equipment - Test methods for direct arc furnaces

Industrielle Elektrowärmeanlagen - Prüfverfahren für Lichtbogen-Schmelzöfen

Chauffage électrique industriel - Méthodes d'essai des fours à arc direct

Ta slovenski standard je istoveten z: EN 60676:2002

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25.180.10 Elektriļ ne peļ i Electric furnaces

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English version

Industrial electroheating equipment - Test methods for direct arc furnaces
(IEC 60676:2002)

Chauffage électrique industriel - Méthodes d'essai des fours à arc direct (CEI 60676:2002)

Industrielle Elektrowärmeanlagen - Prüfverfahren für Lichtbogen-Schmelzöfen (IEC 60676:2002)

This European Standard was approved by CENELEC on 2002-05-01. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

The text of document 27/299/FDIS, future edition 2 of IEC 60676, prepared by IEC TC 27, Industrial electroheating equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60676 on 2002-05-01.

This European Standard supersedes HD 598 S1:1992.

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) 2003-05-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2005-05-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60676:2002 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

Publication	Year	Title	EN/HD	Year
IEC 60050-841	1983	International Electrotechnical Vocabulary (IEV) Chapter 841: Industrial electroheating	-	-
IEC 60146-1-1	1991	Semiconductor convertors - General requirements and line commutated convertors Part 1-1: Specifications of basic requirements	EN 60146-1-1	1993
IEC 60398	1999	Industrial electroheating installations - General test methods	EN 60398	1999

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Chauffage électrique industriel – Méthodes d'essai des fours à arc direct

Industrial electroheating equipment – Test methods for direct arc furnaces

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

INDUSTRIAL ELECTROHEATING EQUIPMENT – TEST METHODS FOR DIRECT ARC FURNACES

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60676 has been prepared by IEC technical committee 27: Industrial electroheating equipment.

This second edition cancels and replaces the first edition published in 1980 and constitutes a technical revision.

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

FDIS	Report on voting
27/299/FDIS	27/306/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 3.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

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

The contents of the corrigendum of July 2002 have been included in this copy.

INDUSTRIAL ELECTROHEATING EQUIPMENT – TEST METHODS FOR DIRECT ARC FURNACES

1 Scope and object

This International Standard applies to industrial three-phase direct arc furnaces, the rated capacity of which is equal to, or greater than, 500 kg. The furnaces are suitable both for solid and liquid charges at or near internal atmospheric pressure.

This standard is also applicable to furnaces having one or more electrodes, other than three-phase furnaces, in so far as it applies.

These furnaces are intended for the melting of ferrous metals (for example, steel, cast iron) and non-ferrous metals (for example, copper); they may also be used as holding furnaces for a liquid charge to superheat and maintain the temperature before tapping.

The object of this publication is the standardization of arc furnace test conditions and of methods to determine the main parameters and technical operating characteristics.

NOTE 1 These tests are to be executed independently of the status of compensating equipment.

The scope of this standard does not cover all possible test methods which may be carried out for the technical and economic assessment of arc furnaces.

NOTE 2 Complementary test conditions may be agreed between manufacturer and user.

Tests for some special equipment for d.c. direct arc furnaces such as controlled rectifiers are covered by IEC 60146-1-1.

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):1983, *International Electrotechnical Vocabulary (IEV) – Chapter 841: Industrial electroheating*

IEC 60146-1-1:1991, *Semiconductor convertors – General requirements and line commutated convertors – Part 1-1: Specifications of basic requirements*

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

3 Definitions

For the purposes of this International Standard, the definitions of IEC 60050-841, some of which are reproduced below, as well as the following definitions, apply.

3.1
arc furnace
furnace in which the electric arc is the main source of heat

[IEV 841-04-27]

3.2
direct arc furnace
arc furnace in which the arc is maintained between the charge and one or more electrodes

[IEV 841-04-28]

3.3
arc furnace installation
furnace assembly with a complete set of electrical equipment comprising

a) main electrical circuit consisting of
   - high-voltage equipment;
   - a.c. reactor (if applicable);
   - furnace transformer;
   - high-current line (secondary side);
   - controlled rectifier and d.c. reactor (only applicable for d.c. direct arc furnaces);
   - electrodes, arc and charge not being parts of the arc furnace installation;

b) equipment for control of the electrical parameters, such as boards, panels, desks with protection, control, measuring and signalling devices

3.4
arc furnace shell
steel constructed vessel usually with refractory lined bottom and side walls into which the charge is placed

[IEV 841-04-43]

3.5
rated volume of the furnace
total internal volume of the furnace body as defined by the inner surface of the specified shell lining

NOTE The volume between the upper level of the shell and the underside of the roof is not included in the rated volume.

3.6
rated capacity of the furnace
calculated capacity in tonnes of liquid metal for which the furnace has been designed, built and marked

NOTE 1 This capacity is defined with the specified shell lining, manufactured in accordance with the design, with allowance for the maximum expected slag volume over the liquid metal surface without exceeding the normal sill level.

NOTE 2 The specific density of the liquid metal used by the manufacturer for the calculations should be clearly defined.