



SLOVENSKI STANDARD SIST EN ISO 8894-1:2010

01-september-2010

Nadomešča:
SIST EN 993-14:1998

Ognjevzdržni materiali - Ugotavljanje toplotne prevodnosti - 1. del: Metoda vroče žice (navzkrižnih žic in metode termometriške odpornosti) (ISO 8894-1:2010)

Refractory materials - Determination of thermal conductivity - Part 1: Hot-wire methods (cross-array and resistance thermometer) (ISO 8894-1:2010)

Einführendes Element - Haupt-Element - Teil 1: Teil-Titel (ISO 8894-1:2010)

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Matériaux réfractaires - Détermination de la conductivité thermique - Partie 1 : Méthodes du fil chaud (ISO 8894-1:2010)

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Ta slovenski standard je istoveten z: EN ISO 8894-1:2010

ICS:

81.080 Ognjevzdržni materiali Refractories

SIST EN ISO 8894-1:2010 en,fr

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 8894-1

May 2010

ICS 81.080

Supersedes EN 993-14:1998

English Version

**Refractory materials - Determination of thermal conductivity -
Part 1: Hot-wire methods (cross-array and resistance
thermometer) (ISO 8894-1:2010)**

Matériaux réfractaires - Détermination de la conductivité
thermique - Partie 1: Méthodes du fil chaud (croisillon et
thermomètre à résistance) (ISO 8894-1:2010)

Feuerfeste Werkstoffe - Bestimmung der
Wärmeleitfähigkeit - Teil 1: Heißdrahtverfahren
(Kreuzverfahren und Widerstandsthermometer-Verfahren)
(ISO 8894-1:2010)

This European Standard was approved by CEN on 6 May 2010.

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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 CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN ISO 8894-1:2010) has been prepared by Technical Committee ISO/TC 33 "Refractories" in collaboration with Technical Committee CEN/TC 187 "Refractory products and materials" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 993-14:1998.

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INTERNATIONAL STANDARD

ISO
8894-1

Second edition
2010-05-15

Refractory materials — Determination of thermal conductivity —

Part 1: Hot-wire methods (cross-array and resistance thermometer)

iTeh STANDARD PREVIEW
*Matériaux réfractaires — Détermination de la conductivité thermique —
Partie 1: Méthodes du fil chaud («croisillon» et «thermomètre à
résistance»)*
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Reference number
ISO 8894-1:2010(E)

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Published in Switzerland

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ISO 8894-1:2010(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8894-1 was prepared by Technical Committee ISO/TC 33, *Refractories*.

This second edition cancels and replaces the first edition (ISO 8894-1:1987), which has been revised to include a hot-wire “resistance thermometer” method, as well as the hot-wire “cross-array” method and to harmonize the text with that of EN 993-14:1998, *Methods of testing dense shaped refractory products — Part 14: Determination of thermal conductivity by the hot-wire (cross-array) method*, prepared by CEN/TC 187.

ISO 8894 consists of the following parts, under the general title *Refractory materials — Determination of thermal conductivity*:

- *Part 1: Hot-wire methods (cross-array and resistance thermometer)*
- *Part 2: Hot-wire method (parallel)*

Refractory materials — Determination of thermal conductivity —

Part 1: Hot-wire methods (cross-array and resistance thermometer)

1 Scope

This part of ISO 8894 describes the hot-wire methods (“cross-array” and “resistance thermometer”) for the determination of the thermal conductivity of non-carbonaceous, dielectric refractory products and materials.

This methods are applicable to dense and insulating refractories (shaped products, refractory castables, plastic refractories, ramming mixes, powdered or granular materials) with thermal conductivity values less than 1,5 W/m·K (“cross-array”) and less than 15 W/m·K (“resistance thermometer”) and thermal diffusivity values less than 5×10^{-6} m²/s.

Thermal conductivity values can be determined at a room temperature up to 1 250 °C. The maximum temperature (1 250 °C) can be reduced by the maximum service limit temperature of the refractory, or by the temperature at which the refractory is no longer dielectric.

NOTE 1 In general, it is difficult to make accurate measurements on anisotropic materials and the use of this method for such materials can be agreed between the parties concerned.

NOTE 2 The thermal conductivity of products with a hydraulic or chemical bond can be affected by the appreciable amount of water that is retained after hardening or setting and is released on firing. These materials might therefore require pre-treatment; the nature and extent of such pre-treatment and the period for which the test piece is held at the measurement temperature as a preliminary to carrying out the test, are details that are outside the scope of this part of ISO 8894 and are agreed between the parties concerned.

NOTE 3 The measurement of thermal conductivity is not sufficiently uncomplicated for an engineer to expect to achieve correct results without having particular work experience and if the work is based exclusively on this standard. Sufficient experience of measuring temperatures and laboratory skills are imperative.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

thermal conductivity

λ

density of heat flow rate divided by the temperature gradient

NOTE Thermal conductivity is expressed in watts per metre kelvin (W/m·K).

2.2

thermal diffusivity

a

thermal conductivity divided by the bulk density times the specific heat capacity

NOTE 1 $a = \lambda / \rho \cdot c_p$