



SLOVENSKI STANDARD SIST-TS CLC/TS 61482-1:2004

01-februar-2004

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Live working - Flame-resistant materials for clothing for thermal protection of workers - Thermal hazards of an electric arc -- Part 1: Test methods

Arbeiten unter Spannung - Flammwidriges Material für thermische Schutzkleidung - Wärmefluss des elektrischen Lichtbogens -- Teil 1: Prüfverfahren

Travaux sous tension - Matériaux résistant à la flamme pour vêtements de protection thermique des travailleurs - Risques d'arc électrique à effet thermique -- Partie 1: Méthodes d'essai

Ta slovenski standard je istoveten z: **CLC/TS 61482-1:2003**

ICS:

13.260	Xæ•ç[Á ^áÁ \ dã } ã ~ áæ [{ ÉÖ ^ [Á [áÁ æ ^ ç • ç	Protection against electric shock. Live working
13.340.10	Varovalna obleka	Protective clothing

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TECHNICAL SPECIFICATION

CLC/TS 61482-1

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

December 2003

ICS 13.220.40;29.260;29.260.99

English version

**Live working –
Flame-resistant materials for clothing for thermal protection of workers –
Thermal hazards of an electric arc
Part 1: Test methods
(IEC 61482-1:2002)**

Travaux sous tension –
Matériaux résistant à la flamme pour
vêtements de protection thermique des
travailleurs –
Risques d'arc électrique à effet thermique
Partie 1: Méthodes d'essai
(CEI 61482-1:2002)

Arbeiten unter Spannung –
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Schutzkleidung –
Wärmefluss des elektrischen Lichtbogens
Teil 1: Prüfverfahren
(IEC 61482-1:2002)

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This Technical Specification was approved by CENELEC on 2003-09-08.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, 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

Foreword

The text of the International Standard IEC 61482-1:2002, prepared by IEC TC 78, Live working, was submitted to the formal vote and was approved by CENELEC as a CLC/TS 61482-1 on 2003-09-08 without any modification.

The following date was fixed:

- latest date by which the existence of the CLC/TS
has to be announced at national level (doa) 2004-03-12

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes A and ZA are normative and annex B is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61482-1:2002 was approved by CENELEC as a Technical Specification without any modification.

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Annex ZA
(normative)

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

This Technical Specification 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 Technical Specification 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 3175-2	1998	Textiles - Dry cleaning and finishing Part 2: Procedures for tetra-chloroethene	EN ISO 3175	1998
ISO 6330	2000	Textiles - Domestic washing and drying procedures for textile testing	EN ISO 6330	2000
ISO 15025	2000	Protective clothing - Protection against heat and flame - Method of test for limited flame spread	EN ISO 15025	2002

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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

61482-1

Première édition
First edition
2002-02

**Travaux sous tension –
Matériaux résistant à la flamme pour vêtements
de protection thermique des travailleurs –
Risques d'arc électrique à effet thermique –**

Partie 1: **STANDARD PREVIEW**
Méthodes d'essai
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**Live working –
Flame-resistant materials for clothing
for thermal protection of workers –
Thermal hazards of an electric arc –**

**Part 1:
Test methods**

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

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*Pour prix, voir catalogue en vigueur
For price, see current catalogue*

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**LIVE WORKING –
FLAME-RESISTANT MATERIALS FOR CLOTHING
FOR THERMAL PROTECTION OF WORKERS –
THERMAL HAZARDS OF AN ELECTRIC ARC –**

Part 1: Test methods

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 61482-1 has been prepared by IEC technical committee 78: Live working.

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

FDIS	Report on voting
78/406/FDIS	78/432/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.

Annex A forms an integral part of this standard.

Annex B is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

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

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**LIVE WORKING –
FLAME-RESISTANT MATERIALS FOR CLOTHING
FOR THERMAL PROTECTION OF WORKERS –
THERMAL HAZARDS OF AN ELECTRIC ARC –**

Part 1: Test methods

1 Scope

This part of IEC 61482 specifies test methods to measure the arc thermal performance value of materials intended for use in heat- and flame-resistant clothing for workers exposed to electric arcs.

These test methods measure the arc thermal performance value of materials which meet the following requirements: less than 100 mm char length and less than 2 s afterflame after removal from flame, when tested in accordance with ISO 15025, procedure B (bottom-edge ignition) on the outer material, and the char length measured using a modified ISO method as described in annex A.

These methods are used to measure and describe the properties of materials, products, assemblies or garments in response to convective and radiant energy generated by an electric arc in open air under controlled laboratory conditions.

The materials used in these methods are in the form of flat specimens for method A and shirts for method B. Method A is used to measure fabric response to arc exposure when tested in a flat configuration. Method B is used to measure clothing response to an arc exposure including all the garment findings, sewing thread, fastenings, fabrics and other accessories when tested on a mannequin torso.

It is the responsibility of the user of this part of IEC 61482 to establish appropriate safety and health practices prior to use. For specific precautions, see clause 7.

NOTE An alternative test method is under development to measure the same properties using a constrained and directed arc. This method will be added to this part of IEC 61482 when the equivalence to method A has been demonstrated.

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.

ISO 3175-2:1998, *Textiles – Dry cleaning and finishing – Part 2: Procedures for tetrachloroethene*

ISO 6330:2000, *Textiles – Domestic washing and drying procedures for textile testing*

ISO 15025:2000, *Protective clothing – Protection against heat and flame – Method of test for limited flame spread*

3 Terms and definitions

For the purpose of this part of IEC 61482, the following definitions apply.

3.1

arc duration

time duration of the arc, in s

3.2

arc energy, *vidt*

sum of the instantaneous arc voltage values multiplied by the instantaneous arc current values multiplied by the incremental time values during the arc, in J or kW·s

3.3

arc gap

distance between the arc electrodes, in mm

3.4

arc thermal performance value (ATPV)

in arc testing, incident energy on a fabric or material that results in sufficient heat transfer through the fabric or material to cause the onset of a second-degree burn based on the Stoll curve, in kW·s/m²

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3.5

arc voltage

voltage across the arc, V

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3.6

asymmetrical arc current

total arc current produced during closure; it includes a direct component and a symmetrical component, A

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3.7

breakopen

in electric arc testing, material response evidenced by the formation of one or more holes in the material which may allow flame to pass through the material

NOTE The specimen is considered to exhibit breakopen when any hole is at least 300 mm² in area or at least 25 mm in any dimension. A single thread across the opening or hole does not reduce the size of the hole for the purposes of this part of IEC 61482.

3.8

breakopen threshold energy, E_{BT}

highest incident energy exposure value on a fabric or material below the Stoll curve where the specimens do not exhibit breakopen, in kW·s/m²

3.9

charring

formation of carbonaceous residue as the result of pyrolysis or incomplete combustion

3.10

closure

point on supply current waveform where the arc is initiated