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**Arbete med spänning –  
Kläder för skydd mot termiska risker orsakade av ljusbågar –  
Del 1-1: Provning –  
Metod 1: Bestämning av termiska egenskaper (ELIM, ATPV och/eller EBT)  
hos tyg och skyddskläder genom provning med öppen ljusbåge**

*Live working –*

*Protective clothing against the thermal hazards of an electric arc –*

*Part 1-1: Test methods –*

*Method 1: Determination of the arc rating (ELIM, ATPV and/or EBT)  
of clothing materials and of protective clothing using an open arc*

Som svensk standard gäller europastandarden EN IEC 61482-1-1:2019. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 61482-1-1:2019.

**Nationellt förord**

Europastandarden EN IEC 61482-1-1:2019

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61482-1-1, Second edition, 2019 - Live working - Protective clothing against the thermal hazards of an electric arc - Part 1-1: Test methods - Method 1: Determination of the arc rating (ELIM, ATPV and/or EBT) of clothing materials and of protective clothing using an open arc**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61482-1-1, utgåva 1, 2009, gäller ej fr o m 2022-08-07.

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## English Version

Live working - Protective clothing against the thermal hazards of  
an electric arc - Part 1-1: Test methods - Method 1:  
Determination of the arc rating (ELIM, ATPV and/or EBT) of  
clothing materials and of protective clothing using an open arc  
(IEC 61482-1-1:2019)

Travaux sous tension - Vêtements de protection contre les  
dangers thermiques d'un arc électrique - Partie 1-1:  
Méthodes d'essai - Méthode 1: Détermination de la valeur  
assignée d'arc (ELIM, ATPV et/ou EBT) des matériaux pour  
vêtements et des vêtements de protection utilisant un arc  
ouvert  
(IEC 61482-1-1:2019)

Arbeiten unter Spannung - Schutzkleidung gegen  
thermische Gefahren eines Lichtbogens - Teil 1-1:  
Prüfverfahren - Verfahren 1: Bestimmung der Lichtbogen-  
Kennwerte (ELIM, ATPV und/oder EBT) von  
Bekleidungsstoffen und Schutzkleidung mithilfe eines  
offenen Lichtbogens  
(IEC 61482-1-1:2019)

This European Standard was approved by CENELEC on 2019-08-07. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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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 78/1256/FDIS, future edition 2 of IEC 61482-1-1, prepared by IEC/TC 78 "Live working" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61482-1-1:2019.

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) 2020-05-07
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-08-07

This document supersedes EN 61482-1-1:2009 and all of its amendments and corrigenda (if any).

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## **Endorsement notice**

The text of the International Standard IEC 61482-1-1:2019 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 60060-1        | NOTE | Harmonized as EN 60060-1                       |
| IEC 61482-1-2:2014 | NOTE | Harmonized as EN 61482-1-2:2014 (not modified) |
| ISO 3175-2         | NOTE | Harmonized as EN ISO 3175-2                    |
| ISO 6330           | NOTE | Harmonized as EN ISO 6330                      |
| ISO 9151           | NOTE | Harmonized as EN ISO 9151                      |
| ISO 13688          | NOTE | Harmonized as EN ISO 13688                     |
| ISO 15797          | NOTE | Harmonized as EN ISO 15797                     |

## 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 60584-1        | -           | Thermocouples - Part 1: EMF specifications and tolerances                                                | EN 60584-1       | -           |
| IEC 61482-2        | 2018        | Live working – Protective clothing against the thermal hazards of an electric arc – Part 2: Requirements | -                | -           |
| ISO/IEC 17025      | 2017        | General requirements for the competence of testing and calibration laboratories                          | EN ISO/IEC 17025 | 2017        |
| ISO/TR 11610       | -           | Protective clothing - Vocabulary                                                                         | CEN ISO/TR 11610 | -           |
| ISO 11612          | 2015        | Protective clothing – Clothing to protect against heat and flame – Minimum performance requirements      | EN ISO 11612     | 2015        |

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**LIVE WORKING –  
PROTECTIVE CLOTHING AGAINST  
THE THERMAL HAZARDS OF AN ELECTRIC ARC –****Part 1-1: Test methods –  
Method 1: Determination of the arc rating (ELIM, ATPV and/or EBT)  
of clothing materials and of protective clothing using an open arc****FOREWORD**

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

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- addition of the *Incident energy limit (ELIM)* as a further *arc rating* performance property value;
- replacement of char length requirement in the scope by indication that Procedure A is applicable for testing of *materials* meeting the limited flame spread requirements of IEC 61482-2;

- clarification of the definition and the meaning of the *Stoll curve*;
- modification of specification of positioning of *monitor sensors* with respect to the *electric arc* as function of intended high *incident energy* exposure of test specimens;
- modification of specifications of *monitor sensor* construction;
- specification of black paint;
- elimination of *calorimeters* from the chest of the mannequin;
- specification for possible positioning of mannequin(s) at a height different from the centre of the *electric arc* and possible turning in order to adequately expose all parts of the *garment* or clothing which would affect performance;
- more explicit description of requirements for data acquisition system;
- preconditioning of the samples;
- modification of requirements for apparatus and arc exposure verification by *bare shots*;
- more explicit description of test procedures A and B, in particular the subclauses dealing with “sequence of test”, “test parameter” and “test criteria”;
- addition of determination of *arc rating* values of *garments* and/or *garment* assemblies.

The text of this International Standard is based on the following documents:

| FDIS         | Report on voting |
|--------------|------------------|
| 78/1256/FDIS | 78/1262/RVD      |

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

In this standard terms defined in Clause 3 appear in *italics*.

A list of all parts in the IEC 61482 series, published under the general title *Live working – Protective clothing against the thermal hazards of an electric arc*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

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# **LIVE WORKING – PROTECTIVE CLOTHING AGAINST THE THERMAL HAZARDS OF AN ELECTRIC ARC –**

## **Part 1-1: Test methods – Method 1: Determination of the arc rating (ELIM, ATPV and/or EBT) of clothing materials and of protective clothing using an open arc**

### **1 Scope**

This part of IEC 61482 specifies test method procedures to determine the *arc rating of flame resistant clothing materials and garments or assemblies of garments* intended for use in clothing for workers if there is an *electric arc* hazard.

An *open arc* under controlled laboratory conditions is used to determine the values of *ELIM*, *ATPV* or *EBT* of *materials*, *garments* or assemblies of *garments*.

NOTE 1 The user can, if he desires, classify the arc protective performance into *arc rating* protection levels based on *ELIM*, *ATPV* and/or *EBT* values which correspond best to the different hazard and risks levels that can result from the user's risk analysis.

NOTE 2 This document is not dedicated to classifying the arc protective performance of the *material* and clothing into arc protection classes. Procedures determining these arc protection classes APC1 and APC2 are specified in IEC 61482-1-2, which uses a constrained arc for testing.

NOTE 3 This test method is not intended and not appropriate to evaluate whether *materials* or *garments* are *flame resistant* or not, as this is covered in IEC 61482-2.

Other effects than the thermal effects of an *electric arc* like noise, light emissions, pressure rise, hot oil, electric shock, the consequences of physical and mental shock or toxic influences are not covered by this document.

*Protective clothing* for work intentionally using an *electric arc*, e.g. arc welding, plasma torch, is not covered by this document.

### **2 Normative references**

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.

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

IEC 61482-2:2018, *Live working – Protective clothing against the thermal hazards of an electric arc – Part 2: Requirements*

ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories*

ISO/TR 11610, *Protective clothing – Vocabulary*

ISO 11612:2015, *Protective clothing – Clothing to protect against heat and flame – Minimum performance requirements*