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Measurement procedures for materials used in photovoltaic modules - Part 5-1: Edge seals - Suggested test methods for use with edge seal materials

EESTI STANDARDI EESSÕNA

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ICS 27.160

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English Version

Measurement procedures for materials used in photovoltaic
modules - Part 5-1: Edge seals - Suggested test methods for use
with edge seal materials
(IEC 62788-5-1:2020)

Procédures de mesure des matériaux utilisés dans les
modules photovoltaïques - Partie 5-1: Joints d'étanchéité
périphériques - Méthodes d'essai suggérées pour
l'utilisation des matériaux de joints d'étanchéité
périphériques
(IEC 62788-5-1:2020)

Messverfahren für Werkstoffe, die in Photovoltaik-Modulen
verwendet werden - Teil 5-1: Kantenversiegelung -
Empfohlene Prüfverfahren für die Verwendung mit
Kantenversiegelungsmaterialien
(IEC 62788-5-1:2020)

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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 82/1658/FDIS, future edition 1 of IEC 62788-5-1, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62788-5-1:2020.

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) 2021-01-23
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-04-23

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61215 (series)	NOTE	Harmonized as EN 61215 (series)
IEC 61730-1:2016	NOTE	Harmonized as EN IEC 61730-1:2018 (not modified)

CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references	5
3 Terms, definitions and symbols.....	6
3.1 Terms and definitions.....	7
3.2 Symbols.....	7
4 Recommended tests	7
4.1 General.....	7
4.2 Moisture permeation properties.....	7
4.2.1 Moisture breakthrough time	7
4.2.2 Fickian materials	7
4.2.3 Non-Fickian materials	8
4.3 Electrical properties	8
4.3.1 Dielectric strength of the film	8
4.3.2 Volume resistivity	9
4.3.3 Comparative tracking index	9
4.4 Adhesion testing	9
4.4.1 General	9
4.4.2 Lap shear strength.....	9
4.4.3 “T” peel test.....	10
4.4.4 90° peel test	11
4.4.5 Butt joint test	11
4.5 Durability of the materials	12
4.5.1 Relative thermal endurance	12
4.5.2 Dielectric strength degradation	12
4.5.3 Accelerated stress testing.....	13
4.6 Flame resistance	15
4.7 Coefficient of thermal expansion	15
4.8 Rheological properties	15
4.8.1 Complex shear modulus	15
4.8.2 Melt flow rate.....	15
4.9 Other data	15
5 Test report.....	15
Bibliography.....	17
Figure 1 – Lap shear test sample for proving cemented joint.....	10
Figure 2 –Photograph (a)) and schematic (b)) of a z-tensile adhesion test specimen	12
Figure 3 – Schematic of test structure for RTI or RTE dielectric durability testing.....	13
Figure 4 – Test flow for cemented joint evaluation	14

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MEASUREMENT PROCEDURES FOR MATERIALS
USED IN PHOTOVOLTAIC MODULES –**
**Part 5-1: Edge seals –
Suggested test methods for use with edge seal materials**

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International Standard IEC 62788-5-1 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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

FDIS	Report on voting
82/1658/FDIS	82/1689/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.

A list of all parts in the IEC 62788 series, published under the general title *Measurement procedures for materials used in photovoltaic modules*, 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
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MEASUREMENT PROCEDURES FOR MATERIALS USED IN PHOTOVOLTAIC MODULES –

Part 5-1: Edge seals – Suggested test methods for use with edge seal materials

1 Scope

This part of IEC 62788 provides procedures for standardized test methods for evaluating the properties of materials designed to be used as edge seals. When modules are constructed with impermeable (or extremely low permeability) front- and backsheets designed to protect moisture-sensitive photovoltaic (PV) materials, there is still the possibility for moisture to get in from the sides. This moisture ingress pathway can be restricted by using a low-diffusivity material around the perimeter of a module between the impermeable front- and backsheets. Alternatively, it can be desirable to use a low-diffusivity encapsulant, which may significantly reduce moisture ingress over the lifetime of the module, and to evaluate it in a similar way to an edge seal material.

In addition to restricting moisture ingress, edge seal materials also provide electrical insulation. To perform these functions, edge seal materials are relied upon to adhere well.

The test methods described in this document are intended to be used to standardize the way edge seals are evaluated. Only some of these tests are applied for IEC 61215 and IEC 61730, and that status depends on the specific design. It is not required that all of these tests be performed, but that if these measurements are made that they be performed as outlined here.

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 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60243-1:2013, *Electrical strength of insulating materials – Test methods – Part 1: Tests at power frequencies*

IEC 60243-2:2013, *Electrical strength of insulating materials – Test methods – Part 2: Additional requirements for tests using direct voltage*

IEC 60216-5, *Electrical insulating materials – Thermal endurance properties – Part 5: Determination of relative thermal endurance index (RTE) of an insulating material*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60695-11-10, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 61730-2:2016, *Photovoltaic (PV) module safety qualification – Part 2: Requirements for testing*

IEC TS 61836, *Solar photovoltaic energy systems – Terms, definitions and symbols*

IEC 62788-1-2, *Measurement procedures for materials used in photovoltaic modules – Part 1-2: Encapsulants – Measurement of volume resistivity of photovoltaic encapsulants and other polymeric materials*

IEC TS 62788-2:2017, *Measurement procedures for materials used in photovoltaic modules – Part 2: Polymeric materials – Frontsheets and backsheets*

IEC 62788-6-2, *Measurement procedures for materials used in photovoltaic modules – Part 6-2: General Tests – Moisture permeation testing with polymeric materials*

ISO 62, *Plastics – Determination of water absorption*

ISO 1133-1, *Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics – Part 1: Standard method*

ISO 4587, *Adhesives – Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies*

ISO 6721-6, *Plastics – Determination of dynamic mechanical properties – Part 6: Shear vibration – Non-resonance method*

ISO 11359-2, *Plastics – Thermomechanical analysis (TMA) – Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature*

ISO 11443, *Plastics – Determination of the fluidity of plastics using capillary and slit-die rheometers*

ISO 15512, *Plastics – Determination of water content*

UL 746B, *Polymeric materials – Long term property evaluations*

UL 746C, *Polymeric materials – Use in electrical equipment evaluations*

ASTM D3835–08, *Standard test methods determination of properties of polymeric materials by means of a capillary rheometer*

ASTM D6869–03, *Standard test method for coulometric and volumetric determination of moisture in plastics using the Karl Fischer reaction (the reaction of iodine with water)*

ASTM D7191–10, *Standard test method for determination of moisture in plastics by relative humidity sensor*

3 Terms, definitions and symbols

For the purposes of this document, the terms and definitions given in IEC TS 61836 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>