

Irish Standard I.S. EN 62759-1:2015

Photovoltaic (PV) modules - Transportation testing - Part 1: Transportation and shipping of module package units

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National Foreword

I.S. EN 62759-1:2015 is the adopted Irish version of the European Document EN 62759-1:2015, Photovoltaic (PV) modules - Transportation testing - Part 1: Transportation and shipping of module package units

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EUROPEAN STANDARD

EN 62759-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2015

ICS 27.160

English Version

Photovoltaic (PV) modules - Transportation testing -Part 1: Transportation and shipping of module package units (IEC 62759-1:2015)

Modules photovoltaïques (PV) - Essais de transport -Partie 1: Transport et expédition d'unités d'emballage de modules (IEC 62759-1:2015) Transportprüfung von Photovoltaik(PV)-Modulen -Teil 1: Transport und Versand von PV-Modulpaketen (IEC 62759-1:2015)

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EN 62759-1:2015

European foreword

The text of document 82/962/FDIS, future edition 1 of IEC 62759-1, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62759-1:2015.

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)	2016-05-01

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Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When 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: <u>www.cenelec.eu</u>.

Publication	Year	Title	<u>EN/HD</u>	Year
IEC 60068-2-27	2008	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	2009
IEC 60068-2-64	-	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance	EN 60068-2-64	-
IEC 61215	2005	Crystalline silicon terrestrial photovoltaic (PV) modules - Design qualification and type approval	EN 61215	2005
IEC 61646	2008	Thin-film terrestrial photovoltaic (PV) modules - Design qualification and type approval	EN 61646	2008
IEC 61730-2 (mod)	2004	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing	EN 61730-2	2007
IEC/TS 61836	-	Solar photovoltaic energy systems - Terms, definitions and symbols	CLC/TS 61836	-
IEC 62108	2007	Concentrator Photovoltaic (CPV) modules and assemblies - Design qualification and type approval	EN 62108	2008
IEC/TS 62782	_ 1)	Dynamic mechanical load testing for photovoltaic (PV) modules	-	-
ISO 13355	-	Packaging - Complete, filled transport packages and unit loads - Vertical random vibration test	EN ISO 13355	-

¹⁾ To be published.

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EN 62759-1:2015

Publication	Year	Title	<u>EN/HD</u>	<u>Year</u>
ASTM D 880-92	2008	Standard Test Method for Impact Testing for Shipping Containers and Systems	-	-
ASTM D 4169	2008	Standard Practice for Performance Testing of Shipping Containers and Systems	-	-
ASTM D 4728	2006	Standard Test Method for Random Vibration Testing of Shipping Containers	-	-
ASTM D 5277	1992	Standard Test Method for Performing Programmed Horizontal Impacts Using an Inclined Impact Tester	-	-
MIL-STD-810G	-	Test Method Standard: Environmental Engineering Considerations and Laboratory Tests	-	-



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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Photovoltaic (PV) modules – Transportation testing – Part 1: Transportation and shipping of module package units

Modules photovoltaïques (PV) – Essais de transport – Partie 1: Transport et expédition d'unités d'emballage de modules





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Edition 1.0 2015-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Photovoltaic (PV) modules – Transportation testing – Part 1: Transportation and shipping of module package units

Modules photovoltaïques (PV) – Essais de transport – Partie 1: Transport et expédition d'unités d'emballage de modules

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CONTENTS

FOREWORD	3
1 Scope and object	5
2 Normative references	5
3 Terms and definitions	6
4 Sampling	7
5 Handling	7
6 Testing procedures	8
6.1 General	8
6.2 Measurements	11
6.3 Transportation testing	11
6.3.1 General	11
6.3.2 Random vibration testing	11
6.3.3 Shock testing	12
6.4 Environmental stress tests	13
6.4.1 PV modules	13
6.4.2 CPV modules and receivers	14
7 Reporting	14
Annex A (normative) Test profiles	16
A.1 Overview	16
A.2 Data points of appropriate PSD test profiles	16
Figure 1 – Test sequences for PV modules	9
Figure 2 – Test sequences for CPV modules	10
Figure A.1 – Appropriate PSD test profile	
Table A.1 – Severity of common transport test profiles: complete and in range (5 Hz – 200 Hz)	16
Table A 2 Main reference ASTM D4160 (truck medium)	10
Table A.2 – Main Telefence ASTM D4109 (truck filedium)	17
Table A.4 \downarrow ICC 60060 0.64 / MU CTD 9100	۱۱ ج د
Table A.4 - IEC 60068-2-64 / MIL STD 810G	17
Table A.5 – ISTA 3E	17

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PHOTOVOLTAIC (PV) MODULES – TRANSPORTATION TESTING –

Part 1: Transportation and shipping of module package units

FOREWORD

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International Standard IEC 62759-1 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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

FDIS	Report on voting
82/962/FDIS	82/982/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 2.

- 4 -

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- reconfirmed,
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PHOTOVOLTAIC (PV) MODULES – TRANSPORTATION TESTING –

Part 1: Transportation and shipping of module package units

1 Scope and object

Photovoltaic (PV) modules are electrical devices intended for continuous outdoor exposure during their lifetime. Existing type approval standards do not consider mechanical stresses that may occur during transportation to the PV installation destination.

This part of IEC 62759 describes methods for the simulation of transportation of complete package units of modules and combined subsequent environmental impacts, it does however not include pass/fail criteria.

This standard is designed so that its test sequence can co-ordinate with those of IEC 61215 or IEC 61646, so that a single set of samples may be used to perform both the transportation simulation and performance evaluation of a photovoltaic module design. This standard applies to flat plate photovoltaic modules, but may also be used as a basis for testing of CPV modules and assemblies.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-27:2008, Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock

IEC 60068-2-64, Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance

IEC 61215:2005, Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval

IEC 61646:2008, Thin-film terrestrial photovoltaic (PV) modules – Design qualification and type approval

IEC 61730-2:2004, Photovoltaic (PV) module safety qualification – Part 2: Requirements for testing

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

IEC 62108:2007, Concentrator photovoltaic (CPV) modules and assemblies – Design qualification and type approval

IEC 62782, Dynamic mechanical load testing for photovoltaic (PV) modules (to be published)

ISO 13355, Packaging – Complete, filled transport packages and unit loads – Vertical random vibration test

- 6 -

ASTM D880-92:2008, Standard Test Method for Impact Testing for Shipping Containers and Systems

ASTM D4169:2008, Standard Practice for Performance Testing of Shipping Containers and Systems

ASTM D4728:2006, Standard Test Method for Random Vibration Testing of Shipping Containers

ASTM D5277:1992, Test method for performing programmed horizontal impact using an incline impact tester

ISTA 3E:2009, Unitized Loads of Same Product

MIL STD 810G, Test Method Standard for Environmental Engineering Considerations and Laboratory Tests

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TS 61836:1999 and the following apply.

3.1

bandwidth

difference in Hz between the upper and lower limits of a frequency band. For the purposes of the described test method, the bandwidth may be considered equivalent to the frequency resolution of a spectrum analysis

3.2

overall g_{RMS}

square root of the integral of power spectral density over the total frequency range. It describes the severity or harshness of the testing grade

3.3

root mean square

r.m.s.

square root of the mean square value. In the exclusive case of a sine wave, the r.m.s. value is 0,707 times peak value

3.4

random vibration

oscillation whose instantaneous amplitude is not prescribed for any given instant in time. The instantaneous amplitudes of a random vibration are prescribed by a probability distribution function, the integral of which, over a given amplitude range, will give the probable percentage of time that the amplitude will fall within that range. Random vibration contains no periodic or quasi-periodic components

3.5

packaging

material and technology used to protect goods from transportation stresses and separate individual units from each other

3.6

power spectral density

PSD

expression of random vibration in terms of mean-square acceleration per unit of frequency. The units are g^2 /Hz (g^2 /cycles/s). Power spectral density is the limit of the mean square



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