

Photovoltaic system power conversion equipment -
Design qualification and type approval

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 62093:2022 sisaldab Euroopa standardi EN IEC 62093:2022 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62093:2022 consists of the English text of the European standard EN IEC 62093:2022.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 18.02.2022.	Date of Availability of the European standard is 18.02.2022.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 27.160

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis- ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autoriõiguse kaitse kohta, võtke palun ühendust Eesti Standardimis- ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about standards copyright protection, please contact the Estonian Centre for Standardisation and Accreditation: Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Photovoltaic system power conversion equipment - Design
qualification and type approval
(IEC 62093:2022)

Matériel de conversion de puissance des systèmes
photovoltaïques - Qualification de la conception et
approbation de type
(IEC 62093:2022)

Leistungsumrichter für photovoltaische Systeme - Prüfung
der Bauartegnung
(IEC 62093:2022)

This European Standard was approved by CENELEC on 2022-02-14. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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 82/1963/FDIS, future edition 2 of IEC 62093, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62093:2022.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-11-14 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2025-02-14 document have to be withdrawn

This document supersedes EN 62093:2005 and all of its amendments and corrigenda (if any).

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

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62093:2022 was approved by CENELEC as a European Standard without any modification.

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-2	2007	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	2007
IEC 60068-2-6	-	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-14	-	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	-
IEC 60068-2-27	-	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	-
IEC 60068-2-52	-	Environmental testing - Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium, chloride solution)	EN IEC 60068-2-52 -	
IEC 60068-2-60	2015	Environmental testing - Part 2-60: Tests - Test Ke: Flowing mixed gas corrosion test	EN 60068-2-60	2015
IEC 60068-2-68	-	Environmental testing - Part 2-68: Tests - Test L: Dust and sand	EN 60068-2-68	-
IEC 60068-2-78	-	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	-
IEC 60068-3-5	2018	Environmental testing - Part 3-5: Supporting documentation and guidance - Confirmation of the performance of temperature chambers	EN IEC 60068-3-5	2018
IEC 60068-3-6	-	Environmental testing - Part 3-6: Supporting documentation and guidance – Confirmation of the performance of temperature/humidity changes	EN IEC 60068-3-6 -	
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
-	-		+ corrigendum May 1993	
+ A1	1999		+ A1	2000
+ A2	2013		+ A2	2013

IEC 60721-3-3	-	Classification of environmental conditions - EN IEC 60721-3-3 - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weather protected locations	-
IEC 60721-3-4	-	Classification of environmental conditions - EN IEC 60721-3-4 - Part 3-4: Classification of groups of environmental parameters and their severities - Stationary use at non-weather protected locations	-
IEC 61000-3-2	-	Electromagnetic compatibility (EMC) - Part EN IEC 61000-3-2 - 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)	-
IEC 61000-3-12	-	Electromagnetic compatibility (EMC) - Part EN 61000-3-12 - 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤ 75 A per phase	-
IEC/TR 61000-3-14	-	Electromagnetic compatibility (EMC) - Part 3-14: Assessment of emission limits for harmonics, interharmonics, voltage fluctuations and unbalance for the connection of disturbing installations to LV power systems	-
IEC 61180	-	High-voltage test techniques for low-voltage equipment - Definitions, test and procedure requirements, test equipment	EN 61180 -
IEC 61557-1	-	Electrical safety in low voltage distribution systems up to 1 000 V AC and 1 500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 1: General requirements	EN IEC 61557-1 -
IEC/TS 61836	-	Solar photovoltaic energy systems - Terms, definitions and symbols	-
IEC 62109-1	2010	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements	EN 62109-1 2010
IEC 62116	2014	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures	EN 62116 2014
IEC 62477-1	2012	Safety requirements for power electronic converter systems and equipment - Part 1: General	EN 62477-1 2012
-	-		+ A11 2014
+ A1	2016		+ A1 2017
-	-		+ A12 2021
IEC 62716	2013	Photovoltaic (PV) modules - Ammonia corrosion testing	EN 62716 2013
IEC 62852	-	Connectors for DC-application in photovoltaic systems - Safety requirements and tests	EN 62852 -

IEC 62894	2014	Photovoltaic inverters - Data sheet and name plate	-	-
+ A1	2016		-	-
IEC/TS 63106-2		Basic requirements for simulator used for testing of photovoltaic power conversion equipment - Part 2: DC power simulator	-	-
ISO 4892-2	-	Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps	EN ISO 4892-2	-
ISO 12103-1	2016	Road vehicles - Test contaminants for filter - evaluation - Part 1: Arizona test dust		-
ISO 22479	2019	Corrosion of metals and alloys - Sulfur dioxide test in a humid atmosphere (fixed gas method)	-	-

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Photovoltaic system power conversion equipment – Design qualification and type approval

**Matériel de conversion de puissance des systèmes photovoltaïques –
Qualification de la conception et approbation de type**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2022 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Photovoltaic system power conversion equipment – Design qualification and type approval

**Matériel de conversion de puissance des systèmes photovoltaïques –
Qualification de la conception et approbation de type**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 27.160

ISBN 978-2-8322-1064-7

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	6
1 Scope.....	8
2 Normative references	9
3 Terms and definitions	10
4 Sampling	13
5 Testing requirements	14
5.1 General.....	14
5.2 Environmental service conditions	14
5.2.1 General	14
5.2.2 Outdoor	14
5.2.3 Indoor, unconditioned	15
5.2.4 Indoor, conditioned	15
5.3 Test sequences	15
5.3.1 General	15
5.3.2 Test conditions for Category 1 PCE (Module level power electronics)	15
5.3.3 Test conditions for Category 3 PCE–large scale and Category 4 PCE– central large scale power conversion equipment	16
5.3.4 Test conditions for Category 4 PCE (large central power conversion equipment)	16
5.4 General testing requirements	21
5.4.1 Installation of testing sample	21
5.4.2 Peripherals	21
5.4.3 Connectors and wiring	21
5.4.4 Measuring instruments and monitoring equipment	21
5.4.5 Electrical power sources	21
5.4.6 Electrical loads	22
5.4.7 Earthing terminals	22
5.4.8 Controls	22
5.5 Pass criteria.....	23
6 Test procedures	23
6.1 Visual inspection.....	23
6.1.1 Purpose	23
6.1.2 Apparatus	23
6.1.3 Procedure.....	23
6.1.4 Requirements	23
6.2 Characterization of operating performance.....	24
6.2.1 Purpose	24
6.2.2 Apparatus	24
6.2.3 Procedure.....	24
6.2.4 Restrictions and exceptions	24
6.2.5 Requirements	24
6.3 Functionality test.....	24
6.3.1 Purpose	24
6.3.2 Apparatus	25
6.3.3 Procedure.....	25
6.3.4 Restrictions and exceptions	26
6.3.5 Requirements	26

6.4	Voltage (dielectric strength) test	26
6.4.1	Purpose	26
6.4.2	Apparatus	26
6.4.3	Procedure	27
6.5	Bus link capacitor thermal test	27
6.5.1	Purpose	27
6.5.2	Apparatus	27
6.5.3	Procedure	27
6.5.4	Restrictions and exceptions	29
6.5.5	Requirements	29
6.6	Power transistor module thermal test	30
6.6.1	Purpose	30
6.6.2	Apparatus	30
6.6.3	Procedure	30
6.6.4	Restrictions and exceptions	30
6.6.5	Requirements	31
6.7	Humidity freeze test	31
6.7.1	Purpose	31
6.7.2	Apparatus	31
6.7.3	Procedure	32
6.7.4	Restrictions and exceptions	33
6.7.5	Final measurements	33
6.7.6	Requirements	33
6.8	Thermal cycling test	34
6.8.1	Purpose	34
6.8.2	Apparatus	34
6.8.3	Procedure	35
6.8.4	Restrictions and exceptions	37
6.8.5	Final measurements	37
6.8.6	Requirements	37
6.9	Damp heat test	37
6.9.1	Purpose	37
6.9.2	Apparatus	38
6.9.3	Procedure	38
6.9.4	Restrictions and exceptions	40
6.9.5	Final measurements	40
6.9.6	Requirements	40
6.10	Dry heat test	40
6.10.1	Purpose	40
6.10.2	Apparatus	40
6.10.3	Procedure	41
6.10.4	Restrictions and exceptions	42
6.10.5	Final measurements	42
6.10.6	Requirements	42
6.11	UV weathering test	43
6.11.1	Purpose	43
6.11.2	Apparatus	43
6.11.3	Procedure	43
6.11.4	Restrictions and exceptions	43

6.11.5	Requirements	43
7	Optional tests	44
7.1	General.....	44
7.2	Rain intrusion test.....	44
7.2.1	Purpose.....	44
7.2.2	Apparatus.....	44
7.2.3	Procedure.....	44
7.2.4	Restrictions and exceptions	45
7.2.5	Final measurements	45
7.2.6	Requirements	45
7.3	Wind driven rain test	46
7.3.1	Purpose.....	46
7.3.2	Apparatus.....	46
7.3.3	Procedure.....	46
7.3.4	Restrictions and exceptions	47
7.3.5	Final measurements	47
7.3.6	Requirements	47
7.4	Dust test	47
7.4.1	Purpose.....	47
7.4.2	Apparatus.....	48
7.4.3	Procedure.....	48
7.4.4	Exceptions and restrictions.....	48
7.4.5	Requirements	48
7.5	Shipping vibration test	49
7.5.1	Purpose.....	49
7.5.2	Apparatus.....	49
7.5.3	Procedure.....	50
7.5.4	Restrictions and exceptions	50
7.5.5	Final measurements	50
7.5.6	Requirements	50
7.6	Shock test.....	50
7.6.1	Purpose.....	50
7.6.2	Apparatus.....	50
7.6.3	Procedure.....	50
7.6.4	Restrictions and exceptions	51
7.6.5	Final measurements	51
7.6.6	Requirements	51
7.7	Salt mist test.....	51
7.7.1	Purpose.....	51
7.7.2	Apparatus.....	51
7.7.3	Procedure.....	51
7.7.4	Restrictions and exceptions	52
7.7.5	Final measurements	52
7.7.6	Requirements	52
7.8	Mixed gas corrosion test	52
7.8.1	General	52
7.8.2	Apparatus.....	52
7.8.3	Procedure.....	52
7.8.4	Restrictions and exceptions	52

7.8.5	Final measurements	52
7.8.6	Requirements	52
7.9	Ammonia corrosion test	53
7.9.1	Purpose	53
7.9.2	Apparatus	53
7.9.3	Procedure	53
7.9.4	Final measurements	53
7.9.5	Requirements	53
8	Report	53
Annex A (normative) Specification of tests performed for reporting		55
Bibliography		56
Figure 1 – Test sequence for PCEs of Categories 1 to 4		17
Figure 2 – Alternative test sequence for Category 3 PCE		18
Figure 3 – Chamber temperature/humidity profile and power for humidity freeze test		32
Figure 4 – Thermal cycling test – Temperature and output power profile		35
Figure 5 – Damp heat test profile		39
Figure 6 – Dry heat test – Temperature and input voltage profile		41
Figure 7 – Reference for dust accumulation evaluation level		49
Table 1 – Testing sample quantity		14
Table 2 – Environmental condition classifications		15
Table 3 – Summary of test levels (main test sequence)		19
Table 4 – Summary of test levels (optional tests)		20
Table 5 – Temperature and humidity limits for humidity freeze test		33
Table 6 – Upper and lower temperature limits for thermal cycling test		36
Table 7 – Temperature and humidity limits for damp heat test		39
Table 8 – Temperature limits for dry heat test		42

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PHOTOVOLTAIC SYSTEM POWER CONVERSION EQUIPMENT – DESIGN QUALIFICATION AND TYPE APPROVAL

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). 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. 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 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 IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62093 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It is an International Standard.

This second edition cancels and replaces the first edition published in 2005. This edition constitutes a technical revision.

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

- a) Title modified.
- b) This edition focusses on the design qualification of power conversion electronics (PCE), and eliminates the clauses associated with qualification testing of other balance of system components.
- c) While many clause titles remain the same as the first edition, substantial changes have been made.
- d) Whereas the first edition establishes requirements for the design qualification of balance-of-system components used in terrestrial photovoltaic (PV) systems, this edition is limited to power conversion equipment.

e) The test protocols have been changed.

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

Draft	Report on voting
82/1963/FDIS	82/1983/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.