

EXPERT  
REPORT

**OIML E 5**  
4th Edition 2012 (E)

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Overview of the present status of the Standards  
referred to in OIML D 11 - *General requirements  
for electronic measuring instruments (2004)*

Revue du statut actuel des Normes référencées dans le Document OIML D 11 -  
*Exigences générales pour les instruments de mesure électroniques (2004)*

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## Foreword

The International Organization of Legal Metrology (OIML) is a worldwide, intergovernmental organization whose primary aim is to harmonize the regulations and metrological controls applied by the national metrological services, or related organizations, of its Member States. The main categories of OIML publications are:

- **International Recommendations (OIML R)**, which are model regulations that establish the metrological characteristics required of certain measuring instruments and which specify methods and equipment for checking their conformity. OIML Member States shall implement these Recommendations to the greatest possible extent;
- **International Documents (OIML D)**, which are informative in nature and which are intended to harmonize and improve work in the field of legal metrology;
- **International Guides (OIML G)**, which are also informative in nature and which are intended to give guidelines for the application of certain requirements to legal metrology; and
- **International Basic Publications (OIML B)**, which define the operating rules of the various OIML structures and systems.

OIML Draft Recommendations, Documents and Guides are developed by Project Groups linked to Technical Committees or Subcommittees which comprise representatives from OIML Member States. Certain international and regional institutions also participate on a consultation basis. Cooperative agreements have been established between the OIML and certain institutions, such as ISO and the IEC, with the objective of avoiding contradictory requirements. Consequently, manufacturers and users of measuring instruments, test laboratories, etc. may simultaneously apply OIML publications and those of other institutions.

International Recommendations, Documents, Guides and Basic Publications are published in English (E) and translated into French (F) and are subject to periodic revision.

Additionally, the OIML publishes or participates in the publication of **Vocabularies (OIML V)** and periodically commissions legal metrology experts to write **Expert Reports (OIML E)**. Expert Reports are intended to provide information and advice, and are written solely from the viewpoint of their author, without the involvement of a Technical Committee or Subcommittee, nor that of the CIML. Thus, they do not necessarily represent the views of the OIML.

The first (2006) and second (2008) editions of this publication - reference OIML E 5 (E) - were written by Mr. Gep H. Engler. The third (2010) and this fourth (2012) edition were written by Mr. George M. Teunisse, Department of Legal Affairs, Verispect B.V., Department V-JZ, PO Box 654, NL-2600 AR Delft, The Netherlands. Mr. Teunisse is the OIML contact person for technical work for The Netherlands and the secretary of OIML TC 5/SC 1 *Environmental conditions*. The present edition supersedes the previous edition dated 2010.

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**Overview of the present status of the Standards  
referred to in OIML D 11:2004**  
*General requirements for electronic measuring instruments*

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## **1 Introduction**

Following a suggestion by participants in the meeting of OIML TC 5/SC 1 *Electronic instruments* held on 21–22 October 2002 in Delft, the author of this report published - in his capacity of secretary of OIML TC 5/SC 1 - an overview of the status at that time of the ISO and IEC Standards referred to in OIML D 11 in OIML Bulletin Volume XLVI - Number 4 - October 2005.

In this way, OIML TC/SC members were informed of changes without having to wait for an official revision of OIML D 11. Such updated information can assist OIML TCs and SCs in drawing up draft OIML Recommendations, to comply with the statement at the beginning of Annex A of OIML D 11: *“All normative documents are subject to revision, and the users of this Document are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.”*

Since the initial Bulletin article was published, more standards referred to in OIML D 11 have been revised or replaced. Therefore, the secretariat of TC 5/SC 1 carried out an updated overview of changes in the standards referred to. Initially, this was intended to again be published in the OIML Bulletin but it was observed that this would lead to a relatively long article. Therefore, in a discussion with the BIML Director on 22 September 2006, it was concluded that publication as an Expert Report on the OIML web site would be more appropriate. Another advantage of such a publication is that it can easily be updated at any moment. This resulted in the publication of Expert Report E 5:2006. Since updating of standards is a continuous process, it was deemed appropriate in 2008 and subsequently in 2009 to review this publication and new editions were published in 2008 and 2010. Again in 2012 a review was carried out, resulting in this fourth, revised edition.

OIML E 5 therefore replaces the publication in OIML Bulletin Volume XLVI - Number 4 - October 2005 and the present edition replaces the previous three editions dated 2006, 2008 and 2010. It is the intention of the author to update this publication as regularly as possible; new editions will be announced in the OIML Bulletin and on the OIML web site.

It should, however, be stressed that the information given in this report is merely an overview of the current situation, and - due to the fact that it has been approved neither by TC 5/SC 1 (or even discussed in this subcommittee), nor by the CIML - it is published here for informational purposes only and does not have the status of a formal addendum to OIML D 11.

The new versions of the standards have not been reviewed in depth for their contents, so it is up to the TCs and SCs to review them and decide whether the latest version(s) apply to their draft OIML Recommendations and Documents.

The information in the tables below is based on the following web sites (situation as at 8 December 2009):

IEC Standards: [http://www.iec.ch/searchpub/cur\\_fut.htm](http://www.iec.ch/searchpub/cur_fut.htm)

ISO Standards: [http://www.iso.org/iso/iso\\_catalogue.htm](http://www.iso.org/iso/iso_catalogue.htm)

In most cases, the text is an exact copy of the text supplied by ISO and IEC on their web sites.

The quoted corrigenda to the IEC Standards and previews of all IEC standards may be downloaded free of charge from the IEC web site at: [http://www.iec.ch/searchpub/cur\\_fut.htm](http://www.iec.ch/searchpub/cur_fut.htm)

Alternatively, hyperlinks on the following pages of the present publication may be used to view the latest corrigenda, etc.

The contents of the columns "New description of the standard / remarks" and "Major technical changes" are, as far as available, based on the information on the web sites of ISO and IEC and/or published in the relevant new standard. This applies for both the English and the French texts; so the texts in both these languages have not been compared by the author.

## 2 Additions compared to the previous publications

Compared to the initial publication of this overview (OIML Bulletin Volume XLVI – Number 4 - October 2005), the following additions were made in OIML E 5:2006:

D 11	Old standards	New standards
[9]	IEC 60068-2-30 (1980-01) Amendment 1 (1985-08)	IEC 60068-2-30 (2005-08)
[29]	IEC 61000-4-3 Consolidated edition (2002-09)	IEC 61000-4-3 (2006-02)
[30]	IEC 61000-4-4 (2004-07)	Correction 1 (2006-08)
[31]	IEC 61000-4-5 (2001-04)	IEC 61000-4-5 (2005-11)
[32]	IEC 61000-4-6 (2003-05) Amendment 1 (2004-10)	IEC 61000-4-6 (2006-05)
[39]	IEC 61326 (2002-02) Correction 1 (2002-07)	IEC 61326 (2002-02) Correction 1 (2002-07)
		IEC 61326-1 (2005-12)
		IEC 61326-2-1 (2005-12)
		IEC 61326-2-2 (2005-12)
		IEC 61326-2-3 (2006-07)
		IEC 61326-2-4 (2006-06)
		IEC 61326-2-5 (2006-06)

<b>D 11</b>	<b>Old standards</b>	<b>New standards</b>
		IEC 61326-2-6 (2005-12)
		IEC 61326-3-1 (draft)
		IEC 61326-3-2 (draft)
[40]	ISO 16750-2 (2003)	ISO 16750-2 (2006)

Besides a few editorial changes, the following additions were made in the 2008 edition:

<b>D 11</b>	<b>Old standards</b>	<b>New standards</b>
[1]	VIM 1993	ISO/IEC Guide 99 (2007) = OIML V 2-200 (2007)
[2]	OIML B 3 (2003)	Amendment 1 added
[4]	IEC 60068-2-1 (1990-05) Amendment 1 (1993-02) Amendment2 (1994-06)	IEC 60068-2-1 (2007-03)
[5]	IEC 60068-2-2 (1974) Amendment 1 (1993) Amendment 2 (1994)	IEC 60068-2-2 (2007-07)
[6]	IEC 60068-2-6 (1995-03) Correction 1 (1995-03)	IEC 60068-2-6 (2007-12)
[10]	IEC 60068-2-31 (1969-01)	IEC 60068-2-31 (2008-05)
[12]	IEC60068-2-64 (1993-05) Correction 1 (1993-10)	IEC 60068-2-64 (2008-04)
[19]	IEC 60529 (2001-02) IEC 60529 Corr.1 (2003-01)	Corr.2 (2007-10) added
[27]	IEC 61000-4-1 (2000-4)	IEC 61000-4-1 (2006-10)
[29]	IEC 61000-4-3 consolidated edition (2002-09)	AM1 (2007) added
[30]	IEC 61000-4-4 (2004-07)	Corr. 1 (2006-08) Corr. 2 (2007-06) added
[39]	IEC 61326 (2002-02) Corrigendum 1 (2002-07)	Deleted
	IEC 61326-1 (2005-12)	Corr. 1 (2008-02) added
	IEC 61326-2-2 (2005-12)	Corr. 1 (2007-11) added
	IEC 61326-2-6 (2005-12)	Corr. 1 (2007-09) added
	IEC 61326-3-1 (draft)	IEC 61326-3-1 (2008-11)
	IEC 61326-3-2 (draft)	IEC 61326-3-2 (2008-01)
[41]	ISO 7637-1 (2002)	Amendment 1 (2008) added
[42]	ISO 7637-2 (2004)	Amendment 1 (2008) added
[43]	ISO 7637-3 (1995)	ISO 7637-3 (2007)

Besides a few editorial changes, the following additions were made in the 2010 edition compared to the 2008 edition

<b>D 11</b>	<b>Old standards</b>	<b>New standards</b>
[22]	IEC 60721-3-3 (1994-12) IEC 60721-3-3 Amendment 1 (1995-06) IEC 60721-3-3 Amendment 2 (1996-11) Consolidated edition 2.2 (2002-10)	IEC 60721-3-3 Consolidated edition 2.2 (2002-10) Correction 1 (2008-06) added
[28]	IEC 61000-4-2 (1995-01) IEC 61000-4-2 Amendment 1 (1998-01) IEC 61000-4-2 Amendment 2 (2000-11) Consolidated Edition: IEC 61000-4-2 (2001-04) Edition 1.2	IEC 61000-4-2 Ed. 2.0 (2008-12) New edition
[29]	IEC 61000-4-3 Consolidated edition (2002-09)	IEC 61000-4-3 Edition 3.0 (2006-02) Amendment 1 (2007) Consolidated edition 3.1 (2008-04) IEC 61000-4-3 ISH-1 (2008-08) (Interpretation sheet 1) added
[30]	IEC 61000-4-4 (2004-07) Correction 1 (2006-08) Correction 2 (2007-06)	Amendment 1 (2010-01) added
[31]	IEC 61000-4-5 (2001-04)	IEC 61000-4-5 Edition 2.0 (2005-11) Correction 1 (2009-10) to edition 2.0 added
[32]	IEC 61000-4-6 (2003-05) IEC 61000-4-6 Amendment 1 (2004-10)	IEC 61000-4-6 Ed 3.0 (2008-10) New edition
[33]	IEC 61000-4-8 (1993-06) with Amendment 1 (2000-11) Consolidated edition 1.1 (2001-03)	IEC 61000-4-8 Ed. 2.0 (2009-09) New edition
[35]	IEC 61000-4-17 (1999-06) IEC 61000-4-17 Amendment 1 (2001-07) Consolidated edition 1.1 (2002-07)	IEC 61000-4-17 (1999-06) Amendment 2 (2008-11) added Consolidated edition 1.2 (2009-1)



Besides a few editorial changes, the following additions have been made in this new edition (2012) compared to the 2010 edition

<b>D 11</b>	<b>Old standards</b>	<b>New standards</b>
[1]	ISO/IEC Guide 99 (2007) = OIML V 2-200 (2007)	<a href="#">OIML V 2-200 (2012)</a> Consolidated edition with corrections
[2]	OIML B 3 (2003)	<a href="#">OIML B 3 (2011)</a> New edition
[14]	IEC 60068-3-1 Edition 1.0 (1974-01)	IEC 60068-3-1 Edition 2.0 (2011-08) New edition
[19]	IEC 60529 (2001-02) IEC 60529 Correction 1 (2003-01) IEC 60529 Correction 2 (2007-10)	<a href="#">Correction 3 (2009-10)</a> added
[26]	IEC/TS 61000-2-5 Edition 1.0 (1995-09)	IEC/TR 61000-2-5 Edition 2.0 (2011-05) New edition
[29]	IEC 61000-4-3 Edition 3.0 (2006-02) Amendment 1 (2007); Consolidated edition 3.1 (2008-04) IEC 61000-4-3 ISH-1 (2008-08) (Interpretation sheet 1)	IEC 61000-4-3 (2006-02) Consolidated edition 3.2 (2010) <a href="#">IEC 61000-4-3 ISH-1 (2008-08)</a> (Interpretation sheet 1)
[30]	IEC 61000-4-4 Edition 2.0 (2004-07); Correction 1 (2006-08); Correction 2 (2007-06); Amendment 1 (2010-01)	IEC 61000-4-4 Consolidated edition 2.1 (2011-03)
[34]	IEC 61000-4-11 Edition 2.0 (2004-04)	IEC 61000-4-11 Edition 2.0 (2004-04) <a href="#">ISH 1 (2010-08)</a> Interpretation sheet added
[39]	Concerning IEC 61326-2-4 (2006-06)	<a href="#">Correction 1 (2011-07)</a> added
	Concerning IEC 61326-3-1 (2008-01)	<a href="#">Correction 1 (2008-09)</a> added
[40]	ISO 16750-2 Edition 2 (2006)	ISO 16750-2 Edition 3 (2010) New edition
[42]	ISO 7637-2 (2004) + Amendment 1 (2008)	ISO 7637-2 (2011)

For ease of readability, all the titles of the Standards referred to in this publication are presented in italics.

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[1]	International Vocabulary of Basic and General Terms in Metrology (VIM) (1993)	OIML V 2-200 (2012)  is identical to  ISO/IEC Guide 99 (2007)  Consolidated version with corrections (2012)	<i>International vocabulary of metrology -- Basic and general concepts and associated terms (VIM)</i>  ISO/IEC Guide 99 and the identical OIML V 2-200 provide a set of definitions and associated terms, in English and French, for a system of basic and general concepts used in metrology, together with concept diagrams to demonstrate their relations. Additional information is given in the form of examples and notes under many definitions.  This Vocabulary is meant to be a common reference for scientists and engineers, as well as teachers and practitioners, involved in planning or performing measurements, irrespective of the level of measurement uncertainty and irrespective of the field of application. It is also meant to be a reference for governmental and inter-governmental bodies, trade associations, accreditation bodies, regulators and professional societies.	Completely revised Available on OIML web site
[2]	OIML B 3 (2003) (formerly P1)	OIML B 3 (2011)	<i>OIML Basic Certificate System for OIML Type Evaluation of Measuring Instruments</i> This basic OIML publication gives rules for issuing, registering and using OIML Certificates	No consequences concerning the reference. Instead of one, several Issuing Authorities in that State can now be designated per category of instruments Title and contents adapted in order to allow for the inserted OIML B 10. Available on OIML web site
[4]	IEC 60068-2-1 (1990-05) Amd. 1 (1993-02) Amd. 2 (1994-06)	IEC 60068-2-1 Ed. 6.0 (2007-03)	<i>Environmental testing - Part 2-1: Tests - Test A: Cold</i>  This part of IEC 60068 deals with cold tests applicable to both non heat-dissipating and heat-dissipating specimens. For non heat-dissipating specimens, Tests Ab and Ad do not deviate essentially from earlier issues. Test Ae has been added primarily for testing equipment that requires being operational throughout the test, including the conditioning periods.  The object of the cold test is limited to the determination of the ability of components, equipment or other articles to be used, transported or stored at low temperature.  Cold tests covered by this Standard do not enable the ability of specimens to	This sixth edition deals with cold tests applicable both to non heat-dissipating and heat-dissipating specimens. For non heat-dissipating specimens, Tests Ab and Ad do not deviate essentially from earlier issues. Test Ae has been added primary for testing equipment that requires being operational throughout the test including

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
			<p>withstand or operate during the temperature variations to be assessed. In this case, it would be necessary to use IEC 60068-2-14.</p> <p>The cold tests are subdivided as follows: - Cold tests for non heat-dissipating specimens * with gradual change of temperature, Ab; - Cold test for heat-dissipating specimens * with gradual change of temperature, Ad, * with gradual change of temperature, specimen powered throughout, Ae.</p> <p>The procedures given in this Standard are normally intended for specimens that achieve temperature stability during the performance of the test procedure. Temperature chamber(s) are constructed and verified in accordance with specifications IEC 60068-3-5 and IEC 60068-3-7.</p> <p>Further guidance for dry heat and cold tests can be found in IEC 60068-3-1 and general guidance in IEC 60068-1.</p>	the conditioning periods.
[5]	IEC 60068-2-2 (1974) Amd. 1 (1993) Amd. 2 (1994)	IEC 60068-2-2 Ed 5.0 (2007-07)	<p><i>Environmental testing - Part 2-2: Tests - Test B: Dry heat</i></p> <p>This part of IEC 60068 deals with dry heat tests applicable both to heat-dissipating and non heat-dissipating specimens. For non heat-dissipating specimens, Tests Bb and Bd do not deviate essentially from earlier issues. The object of the dry heat test is limited to the determination of the ability of components, equipment or other articles to be used, transported or stored at high temperature.</p> <p>These dry heat tests do not enable the ability of specimens to withstand or operate during the temperature variations to be assessed. In this case, it would be necessary to use IEC 60068-2-14 Test N: Change of temperature.</p> <p>The dry heat tests are subdivided as follows:            Dry heat test for non heat-dissipating specimens            - with gradual change of temperature, Bb.            Dry heat tests for heat-dissipating specimens            - with gradual change of temperature, Bd;            - with gradual change of temperature, specimen powered throughout, Be.</p> <p>The procedures given in this Standard are normally intended for specimens that achieve temperature stability during the performance of the test procedure.</p>	The main changes from the previous edition are as follows: Tests Ba and Bc have been deleted since they were more severe than Test Nb, IEC 60068-2-14: Change of temperature. Secondly it was considered justified to delete the 3 % value on the temperature difference between the chamber air and the wall temperatures. Thirdly it is proposed that the test specimen be powered throughout the test where required; and, finally, the annexes have been removed.

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[6]	IEC 60068-2-6 (1995-03) Corr. 1 (1995-03)	IEC 60068-2-6 Ed 7.0 (2007-12)	<p><i>Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)</i></p> <p>This part of IEC 60068 gives a method of test which provides a standard procedure to determine the ability of components, equipment and other articles, hereinafter referred to as specimens, to withstand specified severities of sinusoidal vibration. If an item is to be tested in an unpackaged form, that is without its packaging, it is referred to as a test specimen. However, if the item is packaged then the item itself is referred to as a product and the item and its packaging together are referred to as a test specimen.</p> <p>The purpose of this test is to determine any mechanical weakness and/or degradation in the specified performance of specimens and to use this information, in conjunction with the relevant specification, to decide upon the acceptability of the specimens. In some cases, the test method may also be used to demonstrate the mechanical robustness of specimens and/or to study their dynamic behavior. Categorization of components can also be made on the basis of a selection from within the severities quoted in the test.</p>	<p>The major changes with regard to the previous edition concern:</p> <ul style="list-style-type: none"> <li>- Reference to the latest version of IEC 60068-2-47: Mounting</li> <li>- Simplification of the layout of the Standard by replacing some tables with text.</li> <li>- Addition of the test report requirements (see Clause 13).</li> </ul>
[9]	IEC 60068-2-30 (1980-01) Amd. 1 (1985-08)	IEC 60068-2-30 Ed 3.0 (2005-08)	<p><i>Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)</i></p> <p>This part of IEC 60068 determines the suitability of components, equipment or other articles for use, transportation and storage under conditions of high humidity - combined with cyclic temperature changes and, in general, producing condensation on the surface of the specimen. If the test is being used to verify the performance of a specimen whilst it is being transported or stored in packaging then the packaging will normally be fitted when the test conditions are being applied. For small, low mass specimens, it may be difficult to produce condensation on the surface of the specimen using this procedure; users should consider the use of an alternative procedure such as that given to IEC 60068-2-38.</p>	<p>The main changes with respect to the previous edition are listed below:</p> <ul style="list-style-type: none"> <li>- editorial changes,</li> <li>- addition of normative references,</li> <li>- addition of guidance for temperature tolerances,</li> <li>- period for recovery has been extended.</li> </ul>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[10]	IEC 60068-2-31 (1969-01)	IEC 60068-2-31 Ed 2.0 (2008-05)	<p><i>Environmental testing - Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens</i></p> <p>This part of IEC 60068 deals with a test procedure for simulating the effects of rough handling shocks, primarily in equipment-type specimens, the effects of knocks, jolts and falls which may be received during repair work or rough handling in operational use. This procedure does not simulate the effects of impacts received during transportation as loosely constrained cargo. Where the effects of loose cargo transportation are to be assessed, test Ee: Bounce should be used. Also this procedure does not simulate the effects of shock applied to installed equipments. Where this effect is to be assessed refer to test Ea: Shock. Testing should only be specified for equipment likely to receive such rough handling, for example those of small to medium size and mass, and should only be applied to those faces and corners where there is a risk of such treatment being encountered. In general, equipment which is frequently handled and serviced (for example field equipment and unit spares) can be considered at risk, whereas equipment forming an integral part of a permanent installation would not normally be considered at risk and need not be tested. Testing may not be applicable to fragile unprotected equipment of irregular shape (for example aircraft nose radar) which, when removed from the installation would be contained in a handling frame or jig. It may however be applicable to these items of equipment when they are in their transit case or in their handling frame or jig. For equipment which stands only on one face (for example the normal base) the test is generally only applied to that face. Shock tests are performed on the specimen when fixed to the test machine. Drop and topple, free fall, repeated free fall and bounce tests are performed with the specimen free.</p>	<p>This second edition cancels and replaces the first edition, published in 1969 and constitutes a technical revision.</p> <p>The major changes with regard to the previous edition concern the introduction of soft packaging tests, where appropriate.</p> <p>This new edition of IEC 60068-2-31 now incorporates the second edition of IEC 60068-2-32 (1975). IEC 60068-2-32 will be withdrawn once this standard has been issued.</p>
[11]	IEC 60068-2-47 (1999-10)	IEC 60068-2-47 Ed 3.0 (2005-4)	<p><i>Environmental testing - Part 2-47: Test - Mounting of specimens for vibration, impact and similar dynamic tests</i></p> <p>This part of IEC 60068 provides methods for mounting products, whether packaged or unpackaged, as well as mounting requirements for equipment and other articles, for the series of dynamic tests in IEC 60068-2, that is impact (Test E), vibration (Test F) and acceleration, steady-state (Test G). When they are fastened to the test apparatus and subjected to these tests, whether packaged or unpackaged, they are referred to as specimens.</p>	<p>The major technical changes with regard to the second edition are related to specific guidance on the testing of packaged products.</p>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[12]	IEC60068-2-64 (1993-05) Corr. 1 (1993-10)	IEC 60068-2-64 Ed 2.0 (2008-04)	<p><i>Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance</i></p> <p>This part of IEC 60068 demonstrates the adequacy of specimens to resist dynamic loads without unacceptable degradation of its functional and/or structural integrity when subjected to the specified random vibration test requirements. Broadband random vibration may be used to identify accumulated stress effects and the resulting mechanical weakness and degradation in the specified performance. This information, in conjunction with the relevant specification, may be used to assess the acceptability of specimens. This standard is applicable to specimens which may be subjected to vibration of a stochastic nature resulting from transportation or operational environments, for example in aircraft, space vehicles and land vehicles. It is primarily intended for unpackaged specimens, and for items in their transportation container when the latter may be considered as part of the specimen itself. However, if the item is packaged, then the item itself is referred to as a product and the item and its packaging together are referred to as a test specimen. This standard may be used in conjunction with IEC 60068-2-47:2005, for testing packaged products. If the specimens are subjected to vibration of a combination of random and deterministic nature resulting from transportation or real life environments, for example in aircraft, space vehicles and for items in their transportation container, testing with pure random may not be sufficient. See IEC 60068-3-8:2003 for estimating the dynamic vibration environment of the specimen and based on that, selecting the appropriate test method.</p>	<p>This second edition cancels and replaces the first edition, published in 1993, and constitutes a technical revision.</p> <p>The major changes with regard to the previous edition concern the removal of Method 1 and Method 2, replaced by a single method, and replacement of Annex A with suggested test spectra and removal of Annex C.</p> <p>Also included in this revision is the testing of soft packed specimens.</p>
[14]	IEC 60068-3-1 Ed 1.0 (1974-01)	IEC 60068-3-1 Ed 2.0 (2011-08)	<p><i>Environmental testing - Part 3-1: Supporting documentation and guidance - Cold and dry heat tests</i></p> <p>This part of IEC 60068 provides background information for Tests A: Cold (IEC 68-2-1), and Tests B: Dry heat (IEC 68-2-2). Includes appendices on the effect of: chamber size on the surface temperature of a specimen when no forced air circulation is used; airflow on chamber conditions and on surface temperatures of test specimens; wire termination dimensions and material on surface temperature of a component; measurements of temperature, air velocity and emission coefficient.</p>	<p>The major changes with regard to the previous edition are as follows:</p> <ul style="list-style-type: none"> <li>- removal of guidance regarding thermal characteristics of chamber walls;</li> <li>- revision of sections that address environmental chambers that do not use movement of air for</li> </ul>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
			The second edition cancels and replaces the first edition, published in 1974, and constitutes a technical revision.	temperature control.
[19]	IEC 60529 (2001-02)  IEC 60529 Corr.1 (2003-01)	IEC 60529 Ed.2.1 (2001-02)  IEC 60529 Corr.1 (2003-01)  IEC 60529 Corr.2 (2007-10)  IEC 60529 Corr.3 (2009-10)	<i>Degrees of protection provided by enclosures (IP Code)</i>  This Standard applies to the classification of degrees of protection provided by enclosures for electrical equipment with a rated voltage not exceeding 72.5 kV.	Both Corr. 1 and Corr. 2 apply to French text only. Corr. 3 applies to Figure 5 – Hand-held device to verify protection against spraying and splashing water; second characteristic numerals 3 and 4 (spray nozzle). Third line, explanatory text: Instead of : 1 inner circles of 12 holes at 30° pitch to read: 2 inner circles of 12 holes at 30° pitch
[22]	IEC 60721-3-3 (1994-12) with Amd. 1 (1995-06) Amd. 2 (1996-11) Cons. edition 2.2 (2002-10)	IEC 60721-3-3 Cons. Ed. 2.2 (2002-10) Corr.1 on Ed. 2.2 (2008-06)	<i>Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weather-protected locations</i>  This part of IEC 60721 classifies groups of environmental parameters and their severities to which products are subjected when mounted for stationary use at weather protected locations.	Corr. 1 applies to English text only and concerns. Classification of biological conditions. Environmental parameter – b) Fauna, 3B3, replace “excluding termites” by “including termites”.

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[26]	IEC/TS 61000-2-5 Ed. 1.0 (1995-09)	IEC/TR 61000-2-5 Ed. 2.0 (2011-05)	<p><i>Electromagnetic compatibility (EMC) - Part 2-5: Environment - Description and classification of electromagnetic environments</i></p> <p>This Technical Report is intended for guidance for those who are in charge of considering and developing immunity requirements. It also gives basic guidance for the selection of immunity levels. The data are applicable to any item of electrical or electronic equipment, sub-system or system that operates in one of the locations as considered in this Technical Report. Knowledge of the electromagnetic environment that exists at locations where electrical and electronic equipment and systems are intended to be operated is an essential precondition in the process of achieving electromagnetic compatibility. This knowledge can be obtained by various approaches, including a site survey of an intended location, the technical assessment of the equipment and system as well as the general literature.</p> <p>This Technical Report provides the following:</p> <ul style="list-style-type: none"> <li>- introduces the concept of disturbance degrees and defines these for each electromagnetic phenomena;</li> <li>- classifies into various location classes and describes them by means of attributes;</li> <li>- provides background information on the different electromagnetic phenomena that may exist within the environment and;</li> <li>- compiles tables of compatibility levels for electromagnetic phenomena that are considered to be relevant for those location classes.</li> </ul>	<p>The second edition cancels and replaces the first edition published in 1995 and constitutes a technical revision. The significant technical changes with respect to the previous edition are the following:</p> <ul style="list-style-type: none"> <li>- the description of the radiated electromagnetic environment has been done in more detail and the considered interference sources have been updated;</li> <li>- the concept of location classes has been reviewed and modified;</li> <li>- the disturbance levels for the various location classes have been reviewed, modified and the phenomena have been described in more detail.</li> </ul>
[27]	IEC 61000-4-1 (2000-4)	IEC 61000-4-1 Ed.3.0 (2006-10)	<p><i>Electromagnetic compatibility (EMC) – Part 4-1: Testing and measurement techniques – Overview of IEC 61000-4 series</i></p> <p>The object of this part of IEC 61000 is to give applicability assistance to the technical committees of IEC or other bodies, users and manufacturers of electrical and electronic equipment on EMC Standards within the IEC 61000-4 series on testing and measurement techniques and to provide general recommendations concerning the choice of relevant tests</p>	<p>Changes introduced in this third edition are for the purpose of updating the text to include reference to the latest publications of the IEC 61000-4 series.</p>



Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[28]	IEC 61000-4-2 (1995-01) with Amd. 1 (1998-01) Amd. 2 (2000-11) Consolidated Edition: IEC 61000-4-2 (2001-04) Ed. 1.2	IEC 61000-4-2 Ed. 2.0 (2008-12)	<p><i>Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques</i></p> <p><i>Section 2: Electrostatic discharge immunity test.</i></p> <p>This part of IEC 61000 relates to the immunity requirements and test methods for electrical and electronic equipment subjected to static electricity discharges, from operators directly, and from personnel to adjacent objects. It additionally defines ranges of test levels which relate to different environmental and installation conditions and establishes test procedures. Its object is to establish a common and reproducible basis for evaluating the performance of electrical and electronic equipment when subjected to electrostatic discharges. In addition, it includes electrostatic discharges which may occur from personnel to objects near vital equipment.</p>	<p>The main changes with respect to the first edition of this standard and its amendments are the following:</p> <ul style="list-style-type: none"> <li>- the specifications of the target have been extended up to 4 GHz. An example of target matching these requirements is also provided;</li> <li>- information on radiated fields from human-metal discharge and from ESD generators is provided;- measurement uncertainty considerations with examples of uncertainty budgets are given too.</li> </ul>
[29]	IEC 61000-4-3 Cons. Ed. 2.0 (2002-09)	IEC 61000-4-3 Cons. Ed 3.2 (2010-04)  ISH-1 (2008-08) (Interpret. sheet 1)	<p><i>Electromagnetic compatibility (EMC) - Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test</i></p> <p>This part of IEC 61000 is applicable to the immunity requirements of electrical and electronic equipment to radiated electromagnetic energy. It establishes test levels and the required test procedures.</p> <p>The object of this Standard is to establish a common reference for evaluating the immunity of electrical and electronic equipment when subjected to radiated, radio-frequency electromagnetic fields. The test method documented in this part of IEC 61000 describes a consistent method to assess the immunity of an equipment or system against a defined phenomenon.</p> <p>This part deals with immunity tests related to the protection against RF electromagnetic fields from any source. Particular considerations are devoted to the protection against radio-frequency emissions from digital radiotelephones and other RF emitting devices.. Therefore, no need to order the Amendment in addition to this publication.</p> <p>It has the status of a basic EMC publication in accordance with IEC Guide 107.</p>	<p>The third edition cancels and replaces the first edition published in 2002 and its amendment 1 (2002), and constitutes a technical revision</p> <p>The consolidated version 3.2 consists of the third edition (2006) and its amendment 1 (2007) and its amendment 2 (2010).</p> <p>The test frequency range may be extended up to 6 GHz to take account of new services. The calibration of the field as well as the checking of power amplifier linearity are specified. The ISH-1 concerns a less restrictive way of interpreting the saturation of</p>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
				amplifiers during EM field calibration while performing a quick check on their behavior
[30]	IEC 61000-4-4 Ed. 2.0 (2004-07)	IEC 61000-4-4 Cons. Ed. 2.1 (2011-03)  <i>Note:</i> IEC 61000-4-4 Ed. 3 Forecast publication date : 2012-05	<p><i>Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test</i></p> <p>This part of IEC 61000 establishes a common and reproducible reference for evaluating the immunity of electrical and electronic equipment when subjected to electrical fast transient/bursts on supply, signal, control and earth ports. The test method documented in this part of IEC 61000-4 describes a consistent method to assess the immunity of an equipment or system against a defined phenomenon.</p> <p>The Standard defines: - test voltage waveform; - range of test levels; - test equipment; - verification procedures of test equipment; - test set-up; - test procedure.</p> <p>The Standard gives specifications for laboratory and post-installation tests.</p> <p>The corrigenda can be downloaded free of charge:  <a href="http://www.iec.ch/cgi-bin/getcorr.pl/iec61000-4-4-cor1{ed2.0}b.pdf?file=iec61000-4-4-cor1{ed2.0}b.pdf">http://www.iec.ch/cgi-bin/getcorr.pl/iec61000-4-4-cor1{ed2.0}b.pdf?file=iec61000-4-4-cor1{ed2.0}b.pdf</a>  <a href="http://www.iec.ch/cgi-bin/getcorr.pl/iec61000-4-4-cor2{ed2.0}b.pdf?file=iec61000-4-4-cor2{ed2.0}b.pdf">http://www.iec.ch/cgi-bin/getcorr.pl/iec61000-4-4-cor2{ed2.0}b.pdf?file=iec61000-4-4-cor2{ed2.0}b.pdf</a></p>	<p>The consolidated version 2.1 comprises the second edition (2004-07) the corrections 1 (2006-08) and 2 (2007-06) and its amendment 1 (2010-01).</p> <p>Corr. 1: Figure 4 replaced</p> <p>Corr. 2: 6.2.2 changed</p> <p>Amd. 1: 6.2.2 “Verification of the wave-form at the output of the coupling/ decoupling network” amended</p>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[31]	IEC 61000-4-5 (2001-04)	IEC 61000-4-5 Ed. 2.0 (2005-11) Corr. 1 (2009-10)  <i>Note:</i> IEC 61000-4-5 Ed. 3 Forecast publication date : 2013-03	<p><i>Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test</i></p> <p>This part of IEC 61000 relates to the immunity requirements, test methods, and range of recommended test levels for equipment to unidirectional surges caused by overvoltages from switching and lightning transients. Several test levels are defined which relate to different environment and installation conditions. These requirements are developed for and are applicable to electrical and electronic equipment.</p> <p>The object of this Standard is to establish a common reference for evaluating the immunity of electrical and electronic equipment when subjected to surges. The test method documented in this part of IEC 61000 describes a consistent method to assess the immunity of an equipment or system against a defined phenomenon. This Standard defines:</p> <ul style="list-style-type: none"> <li>- a range of test levels;</li> <li>- test equipment;</li> <li>- test setups;</li> <li>- test procedures.</li> </ul> <p>The task of the described laboratory test is to find the reaction of the EUT under specified operational conditions, to surge voltages caused by switching and lightning effects at certain threat levels.</p> <p>It is not intended to test the capability of the EUT's insulation to withstand high-voltage stress. Direct injections of lightning currents, i.e. direct lightning strikes, are not considered in this Standard.</p> <p>It has the status of a basic EMC publication in accordance with IEC Guide 107.</p>	<p>This second edition cancels and replaces the first edition published in 1995 and its Amendment 1 (2000), and constitutes a technical revision. Particularly, the clauses relating to coupling/decoupling networks and to test setups are more detailed.</p> <p>Corr. 1 applies to French text only</p>
[32]	IEC 61000-4-6 (2003-05) Amd. 1 (2004-10)	IEC 61000-4-6 Ed. 3.0 (2008-10)  <i>Note:</i>	<p><i>Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields</i></p> <p>This part of IEC 61000-4 relates to the conducted immunity requirements of electrical and electronic equipment to electromagnetic disturbances coming from intended radio-frequency (RF) transmitters in the frequency range 9 kHz up to 80 MHz. Equipment not having at least one conducting cable (such as mains supply, signal line or earth connection) which can couple the equipment to the disturbing RF fields is excluded.</p>	<p>This third edition of IEC 61000-4-6:2008 cancels and replaces the second edition published in 2003, Amendment 1 (2004) and Amendment 2 (2006). A draft new amendment for implementing an informative annex on measurement uncertainty lead to publication</p>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
		IEC 61000-4-6 Ed. 4 Forecast publication date : 2013-07	The object of this Standard is to establish a common reference for evaluating the functional immunity of electrical and electronic equipment when subjected to conducted disturbances induced by radio-frequency fields. The test method documented in this part of IEC 61000 describes a consistent method to assess the immunity of an equipment or system against a defined phenomenon.	of this new edition
[33]	IEC 61000-4-8 (1993-06) with Amd. 1 (2000-11) Consolidated Ed. 1.1 (2001-03)	IEC 61000-4-8 Ed. 2.0 (2009-09)	<p><i>Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test</i></p> <p>This part of IEC 61000 relates to the immunity requirements of equipment, only under operational conditions, to magnetic disturbances at power frequency related to:</p> <ul style="list-style-type: none"> <li>- residential and commercial locations</li> <li>- industrial installations and power plants</li> <li>- medium voltage and high voltage sub-stations</li> </ul> <p><i>This standard does not consider disturbances due to capacitive or inductive coupling in cables or other parts of the field installation. The object of this Standard is to establish a common and reproducible basis for evaluating the performance of electrical and electronic equipment for household, commercial and industrial applications when subjected to magnetic fields at power frequency (continuous and short duration field).</i></p>	This second edition cancels and replaces the first edition published in 1993 and its Amendment 1 (2000). It forms a technical revision. This edition includes the following significant technical changes with respect to the previous edition: the scope is extended in order to cover 60 Hz. Characteristics, performance and verification of the test generator and related inductive coils are revised. Modifications are also introduced in the test set-up (GRP) and test procedure.
[34]	IEC 61000-4-11 Ed 2.0 (2004-04)	IEC 61000-4-11 Ed.2.0 (2004-04)  I-SH 1 (2010-08)	<p><i>Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests</i></p> <p>This part of IEC 61000 defines the immunity test methods and range of preferred test levels for electrical and electronic equipment connected to low-voltage power supply networks for voltage dips, short interruptions, and voltage variations. This standard applies to electrical and electronic equipment having a rated input current not exceeding 16 A per phase, for connection to 50 Hz or 60 Hz a.c. networks. It does not apply to electrical and electronic equipment for connection to 400 Hz a.c. networks. The object of this standard is to establish a common reference for evaluating the immunity of electrical and electronic equipment when subjected to voltage dips, short interruptions and voltage variations. This second edition cancels and replaces the first edition published in 1994 and its</p>	The interpretation sheet added explains that specified rise and fall times apply to the generator specifications only.

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
			<p>amendment 1 (2000). This second edition constitutes a technical revision in which</p> <ol style="list-style-type: none"> <li>1. preferred test values and durations have been added for the different environment classes;</li> <li>2. the tests for the three-phase systems have been specified.</li> </ol> <p>It has the status of a Basic EMC Publication in accordance with IEC Guide 107.</p> <p><i>Interpretation Sheet 1</i>  <a href="http://webstore.iec.ch/corrigenda/iec61000-4-11-i1%7Bed2.0%7Db.pdf">http://webstore.iec.ch/corrigenda/iec61000-4-11-i1%7Bed2.0%7Db.pdf</a></p>	
[35]	IEC 61000-4-17 (1999.06) Amd. 1 (2001-07) Consolidated edition (2002-07) Ed. 1.1	IEC 61000-4-17 Cons. Ed. 1.2 (incl. Amd. 1+ Amd. 2) (2009-01)	<p><i>Electromagnetic compatibility (EMC) –Part 4-17: Testing and measurement techniques – Ripple on DC input power port immunity test</i></p> <p>This part of IEC 61000 defines test methods for immunity to ripple at the DC input power port of electrical or electronic equipment. This standard is applicable to low-voltage DC power ports of equipment supplied by external rectifier systems, or batteries which are being charged. The object of this standard is to establish a common and reproducible basis for testing, in a laboratory, electrical and electronic equipment when subjected to ripple voltages such as those generated by rectifier systems and/or auxiliary service battery chargers overlaying on DC power supply sources. This standard defines:</p> <ul style="list-style-type: none"> <li>- test voltage waveform</li> <li>- range of test levels</li> <li>- test generator</li> <li>- test set-up</li> <li>- test procedure.</li> </ul> <p>This test does not apply to equipment connected to battery charger systems incorporating switch mode converters.</p>	This consolidated version consists of the first edition (1999), its amendment 1 (2001) and its amendment 2 (2008). Amd. 2 concerns editorial changes and removal of dates from the standards referred to.
[37]	IEC 61000-6-1 (1997-07)	IEC 61000-6-1 Ed 2.0 (2005-3)	<p><i>Electromagnetic compatibility (EMC) - Part 6-1: Generic Standards - Immunity for residential, commercial and light-industrial environments</i></p> <p>This part of IEC 61000 applies to electrical and electronic apparatus intended for use in residential, commercial and light-industrial environments. Immunity requirements in the frequency range 0 Hz to 400 GHz are covered. No tests need to be performed at frequencies where no requirements are specified. This generic EMC immunity Standard is applicable if no relevant dedicated</p>	This second edition constitutes a technical revision. Specific technical changes have been introduced to Tables 1 to 4. The frequency range for tests according to IEC 61000-4-3 has been extended above 1 GHz according to

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
			<p>product or product-family EMC immunity Standard exists. This Standard applies to apparatus intended to be directly connected to a low-voltage public mains network or connected to a dedicated DC source which is intended to interface between the apparatus and the low-voltage public mains network. This Standard applies also to apparatus which is battery operated or is powered by a non-public, but non-industrial, low voltage power distribution system if this apparatus is intended to be used in the locations described below. The environments encompassed by this Standard are residential, commercial and light industrial locations, both indoor and outdoor. The following list, although not comprehensive, gives an indication of locations which are included:</p> <ul style="list-style-type: none"> <li>- residential properties, for example houses, apartments;</li> <li>- retail outlets, for example shops, supermarkets;</li> <li>- business premises, for example offices, banks;</li> <li>- areas of public entertainment, for example cinemas, public bars, dance halls;</li> <li>- outdoor locations, for example petrol stations, car parks, amusement and sports centers;</li> <li>- light-industrial locations, for example workshops, laboratories, service centers.</li> </ul> <p>Locations which are characterized by being supplied directly at low voltage from the public mains network are considered to be residential, commercial or light-industrial. The object of this Standard is to define the immunity test requirements for apparatus specified in the scope in relation to continuous and transient, conducted and radiated disturbances including electrostatic discharges. The immunity requirements have been selected to ensure an adequate level of immunity for apparatus at residential, commercial and light-industrial locations. The levels do not, however, cover extreme cases, which may occur at any location, but with an extremely low probability of occurrence. Not all disturbance phenomena have been included for testing purposes in this Standard but only those considered as relevant for the equipment covered by this Standard. These test requirements represent essential electromagnetic compatibility immunity requirements. Test requirements are specified for each port considered.</p>	<p>technologies used in this frequency area. The use of TEM waveguide testing according to IEC 61000-4-20 has been introduced for certain products and the testing requirements according to IEC 61000-4-11 have been amended significantly.</p>
[38]	IEC 61000-6-2 (1999-01)	IEC 61000-6-2 Ed. 2.0 (2005-01)	<p><i>Electromagnetic compatibility (EMC) - Part 6-2: Generic Standards - Immunity for industrial environments</i></p> <p>This part of IEC 61000 applies to electrical and electronic apparatus intended for use in industrial environments, as described below.</p>	<p>This second edition constitutes a technical revision. Specific technical changes have been introduced to Tables 1 to 4. The frequency range for tests</p>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
			<p>Immunity requirements in the frequency range 0 Hz to 400 GHz are covered. No tests need to be performed at frequencies where no requirements are specified. This generic EMC immunity Standard is applicable if no relevant dedicated product or product-family EMC immunity Standard exists.</p> <p>This Standard applies to apparatus intended to be connected to a power network supplied from a high or medium voltage transformer dedicated to the supply of an installation feeding manufacturing or similar plant, and intended to operate in or in proximity to industrial locations, as described below. This Standard applies also to apparatus which is battery operated and intended to be used in industrial locations.</p> <p>The environments encompassed by this Standard are industrial, both indoor and outdoor.</p> <p>Industrial locations are in addition characterized by the existence of one or more of the following:</p> <ul style="list-style-type: none"> <li>- industrial, scientific and medical (ISM) apparatus (as defined in CISPR 11);</li> <li>- heavy inductive or capacitive loads are frequently switched;</li> <li>- currents and associated magnetic fields are high.</li> </ul> <p>The object of this Standard is to define immunity test requirements for apparatus defined in the scope in relation to continuous and transient, conducted and radiated disturbances, including electrostatic discharges.</p> <p>The immunity requirements have been selected to ensure an adequate level of immunity for apparatus at industrial locations. The levels do not, however, cover extreme cases, which may occur at any location, but with an extremely low probability of occurrence. Not all disturbance phenomena have been included for testing purposes in this Standard, but only those considered as relevant for the equipment covered by this Standard. These test requirements represent essential electromagnetic compatibility immunity requirements</p>	<p>according to IEC 61000-4-3 has been extended above 1 GHz according to technologies used in this frequency area. The use of TEM waveguide testing according to IEC 61000-4-20 has been introduced for certain products and the testing requirements according to IEC 61000-4-11 have been amended significantly.</p>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[39]	IEC 61326 (2002-02) Corrigendum 1 (2002-07)	IEC 61326-1 Ed. 1.0 (2005-12)  Corr. 1 (2008-02)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements</i></p> <p>This part of IEC 61326 specifies requirements for immunity and emissions regarding electromagnetic compatibility (EMC) for electrical equipment, operating from a supply or battery of less than 1 000 V AC or 1 500 V DC or from the circuit being measured, intended for professional, industrial-process, industrial-manufacturing and educational use, including equipment and computing devices.</p>	The IEC 61326 series cancels and replaces IEC 61326: 2002 and constitutes a technical revision.
		IEC 61326-2-1 (2005-12)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-1: Particular requirements - Test configurations, operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications.</i></p> <p>This part of IEC 61326 specifies more detailed test configurations, operational conditions and performance criteria for equipment with test and measurement circuits (both internal and/or external to the equipment) that are not EMC protected for operational and/or functional reasons, as specified by the manufacturer.</p>	
		IEC 61326-2-2 (2005-12)  Corr. 1 (2007-11)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-2: Particular requirements - Test configurations, operational conditions and performance criteria for portable test, measuring and monitoring equipment used in low-voltage distribution systems.</i></p> <p>This part of IEC 61326 specifies more detailed test configurations, operational conditions and performance criteria for equipment which is used for testing, measuring or monitoring of protective measures in low-voltage distribution systems, and powered by battery and/or from the circuit measured, and portable.</p>	



Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
		IEC 61326-2-3 (2006-07)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning.</i></p> <p>This part of IEC 61326 specifies more detailed test configurations, operational conditions and performance criteria for transducers with integrated or remote signal conditioning. Applies only to transducers characterized by their ability to transform, with the aid of an auxiliary energy source, a non-electric quantity to a process-relevant electrical signal, and to output the signal at one or more ports.</p>	
		IEC 61326-2-4 (2006-06)  Corr. 1 (2011-07)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-4: Particular requirements - Test configurations, operational conditions and performance criteria for insulation monitoring devices according to IEC 61557-8 and for equipment for insulation fault location according to IEC 61557-9.</i></p> <p>This part of IEC 61326 specifies more detailed test configurations, operational conditions and performance criteria than IEC 61326-1 for equipment for - insulation monitoring according to IEC 61557-8 - insulation fault location according to IEC 61557-9.</p> <p>This applies to insulation monitoring devices and insulation fault location systems permanently or semi-permanently connected to the distribution system. Corrigendum: <a href="http://webstore.iec.ch/corrigenda/iec61326-2-4-cor1%7bed1.0%7db.pdf">http://webstore.iec.ch/corrigenda/iec61326-2-4-cor1%7bed1.0%7db.pdf</a></p>	IEC 61326-2-4 (2006-06)  Corr. 1 Concerns French text only
		IEC 61326-2-5 (2006-06)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-5: Particular requirements - Test configurations, operational conditions and performance criteria for field devices with interfaces according to IEC 61784-1, CP 3/2.</i></p> <p>This part of IEC 61326 treats the particular features for EMC testing of field devices with interfaces according to IEC 61784-1, CP 3/2. This part of IEC 61326 covers only the field-bus interface of the equipment.</p>	

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
		IEC 61326-2-6 (2005-12)  Corr. 1 (2007-09)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-6: Particular requirements - In vitro diagnostic (IVD) medical equipment.</i></p> <p>This part of IEC 61326 specifies minimum requirements for immunity and emissions regarding electromagnetic compatibility for in vitro diagnostic medical equipment, taking into account the particularities and specific aspects of this electrical equipment and their electromagnetic environment.</p>	<p>Corr. 1 (2007-09) Table 1 – Minimum in IVD medical equipment immunity requirements In the 4<sup>th</sup> column (Test value), Instead of: 5 % during 250/300 cycles Read: Less than 5 % during 250/300 cycles</p>
		IEC 61326-3-1 (2008-01)  Corr. 1 (2008-09)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 3-1: Immunity requirements for equipment performing or intended to perform safety related functions (functional safety) - General industrial applications.</i></p> <p>IEC 61326-1 applies to this part of IEC 61326 but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3. The electromagnetic environments encompassed by this product family Standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.7 of IEC 61326-1. Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this product family Standard, IEC 61326-3-1. <a href="http://webstore.iec.ch/corrigenda/iec61326-3-1-cor1%7bed1.0%7db.pdf">http://webstore.iec.ch/corrigenda/iec61326-3-1-cor1%7bed1.0%7db.pdf</a></p>	<p>Corr. 1 (2008-09) Update of table 2 and 3: use of RF spectrum</p>

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
		IEC 61326-3-2 (2008-01)	<p><i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 3-2: Immunity requirements for equipment performing or intended to perform safety related function (functional safety) - Industrial applications with particular EM environment.</i></p> <p>This part of IEC 61326 but is limited to systems and equipment for industrial applications within a specified electromagnetic environment and intended to perform safety functions as defined in IEC 61508 with SIL 1-3. The electromagnetic environments encompassed by this product family Standard are industrial, both indoor and outdoor, as they can be found in industrial applications with an electromagnetic environment having specified characteristics (for example, process industry). The difference between the electromagnetic environment covered by this Standard compared to the general industrial environment (see IEC 61326-3-1) is due to the mitigation measures employed against electromagnetic phenomena leading to a specified electromagnetic environment.</p>	
[40]	ISO 16750-2 (2003)	ISO 16750-2 Ed. 3 2010	<p><i>Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 2: Electrical loads</i></p> <p>This part of ISO 16750 applies to electric and electronic systems/components for vehicles. It describes the potential environmental stresses and specifies tests and requirements recommended for the specific mounting location on/in the vehicle. Specifically it describes the electrical loads. Electromagnetic compatibility (EMC) is not covered by ISO 16750-2:2010. Electrical loads are independent from the mounting location, but can vary due to the electrical resistance in the vehicle wiring harness and connection system.</p>	Several tests have been changed and 4.1 (Tolerances for voltages etc.) and 4.8 (Ground reference and supply offset) have been added. But Tables 1 and 2 (basis for 14.2.1 in OIML D 11) are unchanged.
[41]	ISO 7637-1 (2002)	ISO 7637-1 (2002) Amd. 1 (2008)	<p><i>Road vehicles -- Electrical disturbances from conduction and coupling -- Part 1: Definitions and general considerations</i></p> <p>This part of ISO 7637 defines the basic terms relating to electrical disturbances from conduction and coupling used in its other parts, and gives general information on the whole of ISO 7637 and common to all parts.</p>	Amd. 1: - new paragraph in the Introduction - new paragraph at the end of clause 4 - new Annex A (Normative)

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present standard as at 7 March 2012	Title and new description of the standard, and remarks	Major technical changes
[42]	ISO 7637-2 (2004)	ISO 7637-2 (2011)	<p><i>Road vehicles -- Electrical disturbances from conduction and coupling -- Part 2: Electrical transient conduction along supply lines only</i></p> <p>This part of ISO 7637 specifies test methods and procedures to ensure the compatibility to conducted electrical transients of equipment installed on passenger cars and commercial vehicles fitted with 12 V or 24 V electrical systems. It describes bench tests for both the injection and measurement of transients. It is applicable to all types of road vehicles independent of the propulsion system (e.g. spark ignition or diesel engine, electric motor).</p>	<p>Amd. 1 replaces Annex A (Normative) - Function Performance Status Classification (FPSC) Pulses 2a, 2b, 3a and 3b test setup has slightly changed. Pulses 3a and 3b pulse width <math>t_d</math> tolerances have decreased. Pulse 4 is shifted to ISO 16750-2</p>
[43]	ISO 7637-3 (1995)	ISO 7637-3 (2007)	<p><i>Road vehicles -- Electrical disturbances from conduction and coupling -- Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines</i></p> <p>This part of ISO 7637 establishes a bench top test for the evaluation of the immunity of devices under test (DUTs) to transient transmission by coupling via lines other than supply lines. The test transient pulses simulate both fast and slow transient disturbances, such as those caused by the switching of inductive loads and relay contact bounce.</p>	Completely revised

<p>In addition to the Standards quoted in OIML D 11, the following IEC Standard gives guidance for the choice of vibration test(s):                  IEC 60068-3-8 (2003-08) <i>Environmental testing - Part 3-8: Supporting documentation and guidance - Selecting amongst vibration tests</i></p>	
<p><b>Description of the Standard IEC 60068-3-8</b></p>	<p><b>Introduction to the Standard IEC 60068-3-8</b></p>
<p>This Standard IEC 60068-3-8 provides guidance for selecting amongst the IEC 60068-2 stationary vibration test methods Fc sinusoidal, Fh random and F(x) Mixed mode vibration. The different steady-state test methods and their aims are briefly described in Clause 4. Transient test methods are not included. For vibration testing, the environmental conditions, especially the dynamic conditions for the specimen, should be known. This Standard helps to collect information about the environmental conditions (Clause 5), to estimate or measure the dynamic conditions (Clause 6) and gives examples to enable decisions to be made on the most applicable environmental vibration test method. Starting from the condition, the method of selecting the appropriate test is given. Since real life vibration conditions are dominated by vibration of a random nature, random testing should be the commonly used method, see Table 1, Clause 7. The methods included hereafter may be used to examine the vibration response of a specimen under test before, during and after vibration testing. The selection for the appropriate excitation method is described in Clause 8 and tabulated in Table 2. In this standard specification, writers will find information concerning vibration test methods and guidance for their selection. For guidance on test parameters, or severities of one of the test methods, reference should be made to the normative references.</p>	<p>Components, equipment and other electrotechnical products, hereinafter called specimens, can be subjected to different kinds of vibration during manufacture, transportation or in service. In the IEC 60721-3 Standards, those different vibration environments are tabulated into classes characterizing stationary and transient vibration conditions. The Standards in the IEC 60068-2 series describe methods for testing with stationary or transient vibration. There will be three Standards in the IEC 60068-2 series for environmental testing that specify test methods employing stationary vibration:                  Part 2-6 Test Fc: Vibration (sinusoidal),                  Part 2-64 Test Fh: Vibration, broad-band random (digital control) and guidance, and                  Part 2-80 Test F-: Mixed mode testing (under consideration)</p>