
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

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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 in 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.”*

In the meantime more standards referred to in OIML D 11 have been revised or replaced. Therefore, the Secretary of TC 5/SC 1 carried out an updated overview of changes in the standards referred to. Initially, this was intended to be published again in the OIML Bulletin but it was observed that this would lead to a relatively large 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.

It must, 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 D 11.

The new versions of the standards have not been reviewed for their contents, so it is up to the TCs and SCs to review and decide for themselves about the applicability of the latest version(s) in draft OIML Recommendations and Documents they are drawing up.

The information in the tables below is based on the following web sites (situation as at 5 September 2006):

IEC standards: http://www.iec.ch/searchpub/cur_fut.htm

ISO standards: <http://www.iso.org/iso/en/CatalogueListPage.CatalogueList>

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

This Report replaces the publication in OIML Bulletin Volume XLVI - Number 4 - October 2005. It is the intention of the author to update this publication about once a year. Such a renewal will be announced in the OIML Bulletin.

The contents of the columns "New description of the standard / remarks" and "Major technical changes" are based on the information available 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.

There is one exception: for ISO 16750-2 (version 2006 versus 2003) such information was unfortunately not available from ISO, so in this case the author did a quick scan for changes that are, in his opinion, the most relevant for their application in the OIML.

2 Additions compared to the previous publication

Compared to the previous publication of this overview (OIML Bulletin Volume XLVI - Number 4 - October 2005), the following additions have been made:

D 11	Old Standards	New Standards
[9]	IEC 60068-2-30 (1980-01) Amm 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) Amm 1 (2004-10)	IEC 61000-4-6 (2006-05)
[39]	IEC 61326 (2002-02) Corr 1 (2002-07)	IEC 61326 (2002-02) Corr 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)
		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)

For more clarity, all the titles of the Standards referred to have been added (in italic) in this publication.

Reference in D 11: 2004	Standard referred to in D 11: 2004	Present Standard as at 5 September 2006	Title and new description of the Standard, and remarks	Major technical changes
[9]	IEC 60068-2-30 (1980-01) Amm 1 (1985-08)	IEC 60068-2-30 (2005-08)	<i>Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)</i> 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.	The main changes with respect to the previous edition are listed below: - editorial changes, - addition of normative references, - addition of guidance for temperature tolerances, - period for recovery has been extended.
[11]	IEC 60068-2-47 (1999-10)	IEC 60068-2-47 (2005-4)	<i>Environmental testing - Part 2-47: Test - Mounting of specimens for vibration, impact and similar dynamic tests</i> This standard 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.	The major technical changes with regard to the second edition are related to specific guidance on the testing of packaged products.
[29]	IEC 61000-4-3 consolidated edition (2002-09)	IEC 61000-4-3 (2006-02)	<i>Electromagnetic compatibility (EMC) - Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test</i> Is applicable to the immunity requirements of electrical and electronic equipment to radiated electromagnetic energy. It establishes test levels and the required test procedures. 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	This third edition cancels and replaces the first edition published in 2002 and its amendment 1 (2002), and constitutes a technical revision. The test frequency range may be extended up to 6 GHz to take account of new services. The

			61000 describes a consistent method to assess the immunity of an equipment or system against a defined phenomenon. 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. It has the status of a basic EMC publication.	calibration of the field as well as the checking of power amplifier linearity of the immunity chain are specified.
[30]	IEC 61000-4-4 (2004-07)	Corrigendum 1 (2006-08)	<i>Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test</i> This corrigendum can be downloaded for free: 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	Figure 4 replaced
[31]	IEC 61000-4-5 (2001-04)	IEC 61000-4-5 (2005-11)	<i>Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test</i> 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. 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: - a range of test levels; - test equipment; - test setups; - test procedures. 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. 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	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 dedicated to coupling/decoupling networks and to test setups are more detailed.

			not considered in this standard. It has the status of a basic EMC publication in accordance with IEC Guide 107.	
[32]	IEC 61000-4-6 (2003-05) Amm 1 (2004-10)	IEC 61000-4-6 (2006-05) Amm 2 (2006-03) Consolidated edition (2006-05)	<i>Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields</i> 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. 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.	This consolidated version is based on the second edition (2003), its amendment 1 (2004), and its amendment 2 (2006). It bears the edition number 2.2.
[37]	IEC 61000-6-1 (1997-07)	IEC 61000-6-1 (2005-3)	<i>Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments</i> This part of IEC 61000 for EMC immunity requirements 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 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: - residential properties, for example houses, apartments;	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 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.

			- retail outlets, for example shops, supermarkets; - business premises, for example offices, banks; - areas of public entertainment, for example cinemas, public bars, dance halls; - outdoor locations, for example petrol stations, car parks, amusement and sports centres; - light-industrial locations, for example workshops, laboratories, service centres. Locations which are characterised 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.	
[38]	IEC 61000-6-2 (1999-01)	IEC 61000-6-2 (2005-01)	<i>Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments</i> This part of IEC 61000 for EMC immunity requirements applies to electrical and electronic apparatus intended for use in industrial environments, as described below. 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. 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. The environments encompassed by this standard are industrial, both indoor and outdoor. Industrial locations are in addition characterised by the existence of one or more of	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 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

			the following: - industrial, scientific and medical (ISM) apparatus (as defined in CISPR 11); - heavy inductive or capacitive loads are frequently switched; - currents and associated magnetic fields are high. 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. 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	requirements according to IEC 61000-4-11 have been amended significantly.
[39]	IEC 61326 (2002-02) Corrigendum 1 (2002-07)	IEC 61326 (2002-02) Corrigendum 1 (2002-07)	<i>Electrical equipment for measurement, control and laboratory use - EMC requirements</i> This standard specifies minimum requirements for immunity and emissions regarding electromagnetic compatibility (EMC) for electrical equipment, operating from a supply of less than 1 000 V a.c. or 1 500 V d.c. or from the circuit being measured, intended for professional, industrial-process and educational use, including equipment and computing devices.	Although all standards IEC 61326-1 to 61326-2-6 state in the foreword: “ <i>The IEC 61326 series cancels and replaces IEC 61326:2002</i> ”, this standard has not yet been withdrawn. This will be done after the drafts IEC 61326-3-1 and IEC 61326-2 have been published.
		IEC 61326-1 (2005-12)	<i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements.</i> 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 a.c. or 1 500 V d.c. or from the circuit being measured, intended for professional, industrial-process, industrial-manufacturing and educational use, including equipment and computing devices	The IEC 61326 series cancels and replaces IEC 61326:2002 and constitutes a technical revision.

		IEC 61326-2-1 (2005-12)	<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> 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.	
		IEC 61326-2-2 (2005-12)	<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> 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	
		IEC 61326-2-3 (2006-07)	<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> 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.	

		IEC 61326-2-4 (2006-06)	<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> 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; This applies to insulation monitoring devices and insulation fault location systems permanently or semi-permanently connected to the distribution system.	
		IEC 61326-2-5 (2006-06)	<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> 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.	
		IEC 61326-2-6 (2005-12)	<i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-6: Particular requirements - In vitro diagnostic (IVD) medical equipment.</i> 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.	
		IEC 61326-3-1 (draft)	<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>	
		IEC 61326-3-2 (draft)	<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>	

[40]	ISO 16750-2 (2003)	ISO 16750-2 (2006)	<i>Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 2: Electrical loads</i> ISO 16750-2:2006 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.	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.
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In addition to the standards quoted in OIML D 11, the following recently published 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>	
Description of the standard IEC 60068-3-8	Introduction to the standard IEC 60068-3-8
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. Has the status of a basic safety publication in accordance with IEC Guide 104.	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)