



SLOVENSKI STANDARD
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Explosive atmospheres -- Part 11: Equipment protection by intrinsic safety i

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Ta slovenski standard je istoveten z: FprEN 60079-11:2009

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ICS:

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kSIST FprEN 60079-11:2010 **en,fr**



31G/198/CDV

COMMITTEE DRAFT FOR VOTE (CDV) PROJET DE COMITÉ POUR VOTE (CDV)

		Project number Numéro de projet	IEC 60079-11 Ed. 6.0	
		IEC/TC or SC: SC 31G CEI/CE ou SC:	Secretariat / Secrétariat United Kingdom	
<input checked="" type="checkbox"/>	Submitted for parallel voting in CENELEC Soumis au vote parallèle au CENELEC	Date of circulation Date de diffusion 2009-10-23	Closing date for voting (Voting mandatory for P-members) Date de clôture du vote (Vote obligatoire pour les membres (P)) 2010-03-26	
Also of interest to the following committees Intéresse également les comités suivants TC18		Supersedes document Remplace le document 31G/187/CD and 31G/190A/CC		
Proposed horizontal standard Norme horizontale suggérée <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the TC/SC secretary Les autres CE/SC sont requis d'indiquer leur intérêt, si nécessaire, dans ce CDV à l'intention du secrétaire du CE/SC				
Functions concerned Fonctions concernées				
<input checked="" type="checkbox"/>	Safety Sécurité	<input type="checkbox"/>	EMC CEM	<input type="checkbox"/>
		<input type="checkbox"/>	Environment Environnement	<input type="checkbox"/>
				Quality assurance Assurance qualité

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SIST EN 60079-11:2012

Titre :

Title : IEC 60079-11 Ed. 6.0: Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

Note d'introduction

La version française sera diffusée ultérieurement

Introductory note

French version will be circulated at a later date

ATTENTION VOTE PARALLÈLE CEI – CENELEC

L'attention des Comités nationaux de la CEI, membres du CENELEC, est attirée sur le fait que ce projet de comité pour vote (CDV) de Norme internationale est soumis au vote parallèle.

Les membres du CENELEC sont invités à voter via le système de vote en ligne du CENELEC.

ATTENTION IEC – CENELEC PARALLEL VOTING

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) for an International Standard is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –**Part 11: Equipment protection by intrinsic safety "i"**

FOREWORD

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International Standard IEC 60079-11 has been prepared by subcommittee 31G: Intrinsically safe apparatus, of IEC technical committee 31: Equipment for explosive atmospheres.

This sixth edition cancels and replaces the fifth edition of IEC 60079-11 published in 2006, and the first edition of IEC 61241-11 published in 2005 and constitutes a full technical revision.

The significant changes with respect to the previous edition are listed below:

- The merging of the requirements for combustible dust atmospheres from IEC 61241-11.
- The merging of the apparatus requirements for FISCO from IEC 60079-27.
- Clarification of the requirements for accessories connected to intrinsically safe apparatus; such as chargers and data loggers.
- Introduction of informative Annex H - Ignition testing of semiconductor limiting power supply circuits
- Addition of new test requirements for opto-isolators

- inclusion of non-edition specific references to IEC 60079-0

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

FDIS	Report on voting

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

This standard supplements and modifies the general requirements of IEC 60079-0, except as indicated in Table 1 (see Scope).

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60079 series, under the general title: *Explosive atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under <http://webstore.iec.ch> in the data related to the specific publication. At this date¹, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

¹ The National Committees are requested to note that for this publication the maintenance result date is 2015

EXPLOSIVE ATMOSPHERES –

Part 11: Equipment protection by intrinsic safety "i"

1 Scope

This part of IEC 60079 specifies the construction and testing of intrinsically safe apparatus intended for use in an explosive atmosphere and for associated apparatus, which is intended for connection to intrinsically safe circuits which enter such atmospheres.

This type of protection is applicable to electrical apparatus in which the electrical circuits themselves are incapable of causing an explosion in the surrounding explosive atmospheres.

This standard is also applicable to electrical apparatus or parts of electrical apparatus located outside the explosive atmosphere or protected by another type of protection listed in IEC 60079-0, where the intrinsic safety of the electrical circuits in the explosive atmosphere may depend upon the design and construction of such electrical apparatus or parts of such electrical apparatus. The electrical circuits exposed to the explosive atmosphere are evaluated for use in such an atmosphere by applying this standard.

The requirements for intrinsically safe systems are provided in IEC 60079-25.

This standard supplements and modifies the general requirements of IEC 60079-0, except as indicated in Table 1. Where a requirement of this standard conflicts with a requirement of IEC 60079-0, the requirements of this standard shall take precedence.

If associated apparatus is placed in the explosive atmosphere, it must be protected by an appropriate type of protection listed in IEC 60079-0, and then the requirements of that method of protection together with the relevant parts of IEC 60079-0 also apply to the associated apparatus.

Table 1 – Applicability of specific clauses of IEC 60079-0

Clause or subclause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-11		
			Intrinsically safe apparatus		Associated apparatus
Ed 5.0 (2007) (Informative)	Ed 6.0 (20??) (Informative)	Clause / Sub-Clause Title (Normative)	Group I and Group II	Group III	
1	1	Scope	Applies	Applies	Applies
2	2	Normative references	Applies	Applies	Applies
3	3	Terms and definitions	Applies	Applies	Applies
4	4	Equipment grouping	Applies	Applies	Applies
4.1	4.1	Group I	Applies	Excluded	Applies
4.2	4.2	Group II	Applies	Excluded	Applies
4.3	4.3	Group III	Excluded	Applies	Applies
4.4	4.4	Equipment for a particular explosive atmosphere	Applies	Applies	Applies
5.1	5.1	Environmental influences	Applies	Applies	Applies

Clause or subclause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-11		
			Intrinsically safe apparatus		Associated apparatus
Ed 5.0 (2007) (Informative)	Ed 6.0 (20??) (Informative)	Clause / Sub-Clause Title (Normative)	Group I and Group II	Group III	
5.1.1	5.1.1	Ambient temperature	Applies	Applies	Applies
5.1.2	5.1.2	External source of heating or cooling	Applies	Applies	Applies
5.2	5.2	Service temperature	Applies	Applies	Applies
5.3.1	5.3.1	Determination of maximum surface temperature	Applies	Applies	Excluded
5.3.2.1	5.3.2.1	Group I electrical equipment	Applies	Excluded	Excluded
5.3.2.2	5.3.2.2	Group II electrical equipment	Applies	Excluded	Excluded
5.3.2.3	5.3.2.3	Group III electrical equipment	Excluded	Applies	Excluded
5.3.3	5.3.3	Small component temperature for Group I and Group II electrical equipment	Applies	Excluded	Excluded
6.1	6.1	General	Applies	Applies	Applies
6.2	6.2	Mechanical strength of equipment	see Note 1	see Note 2	see Note 1
6.3	6.3	Opening times	Excluded	Excluded	Excluded
6.4	6.4	Circulating currents in enclosures (e.g. of large electrical machines)	Excluded	Excluded	Excluded
6.5	6.5	Gasket retention	see Note 1	see Note 2	see Note 1
6.6	6.6	Electromagnetic and ultrasonic radiating equipment	Applies	Applies	Excluded
7.1.1	7.1.1	Applicability	see Note 1	see Note 2	see Note 1
7.1.2	7.1.2.1	General	see Note 1	see Note 2	see Note 1
7.1.3	7.1.2.2	Plastic materials	see Note 1	see Note 2	see Note 1
7.1.4	7.1.2.3	Elastomeric materials	see Note 1	see Note 2	see Note 1
7.2	7.2	Thermal endurance	see Note 1	see Note 2	see Note 1
7.3	7.3	Resistance to light	see Note 1	see Note 2	see Note 1
7.4	7.4	Electrostatic charges on external non-metallic materials	Applies	Applies	Excluded
NR	7.5	Accessible metal parts	Applies	Applies	Excluded
7.5	NR	Threaded Holes	see Note 1	see Note 2	see Note 1
8.1	8.1	Material composition	Applies	Applies	Excluded
	8.2	Group I	Applies	Excluded	Excluded
	8.3	Group II	Applies	Excluded	Excluded
	8.4	Group III	Excluded	Applies	Excluded
8.2	NR	Threaded Holes	see Note 1	see Note 2	see Note 1

Clause or subclause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-11		
			Intrinsically safe apparatus		Associated apparatus
Ed 5.0 (2007) (Informative)	Ed 6.0 (20??) (Informative)	Clause / Sub-Clause Title (Normative)	Group I and Group II	Group III	
9	9	Fasteners	Excluded	Excluded	Excluded
10	10	Interlocking devices	Excluded	Excluded	Excluded
11	11	Bushings	Excluded	Excluded	Excluded
12	12	Materials used for cementing	see Note 1	see Note 2	see Note 1
13	13	Ex Components	Applies	Applies	Applies
14	14	Connection facilities and termination compartments	Excluded	Excluded	Excluded
15	15	Connection facilities for earthing and bonding conductors	Excluded	Excluded	Excluded
16	16	Entries into enclosures	see Note 1	see Note 2	see Note 1
17	17	Supplementary requirements for rotating machines	Excluded	Excluded	Excluded
18	18	Supplementary requirements for switchgear	Excluded	Excluded	Excluded
19	19	Supplementary requirements for fuses	Excluded	Excluded	Excluded
20	20	Supplementary requirements for plugs, socket outlets and connectors	Excluded	Excluded	Excluded
21	21	Supplementary requirements for luminaires	Excluded	Excluded	Excluded
22	22	Supplementary requirements for caplights and handlights	Modified	Applies	Excluded
23.1	23.1	General	Applies	Applies	Applies
23.2	23.2	Batteries	Excluded	Excluded	Excluded
23.3	23.3	Cell types	Applies	Applies	Applies
23.4	23.4	Cells in a battery	Applies	Applies	Applies
23.5	23.5	Ratings of batteries	Applies	Applies	Applies
23.6	23.6	Interchangeability	Applies	Applies	Applies
23.7	23.7	Charging of primary batteries	Applies	Applies	Applies
23.8	23.8	Leakage	Applies	Applies	Applies
23.9	23.9	Connections	Applies	Applies	Applies
23.10	23.10	Orientation	Applies	Applies	Applies
23.11	23.11	Replacement of cells or batteries	Applies	Applies	Applies
23.12	23.12	Replaceable battery pack	Applies	Applies	Applies
24	24	Documentation	Applies	Applies	Applies

Clause or subclause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-11		
			Intrinsically safe apparatus		Associated apparatus
Ed 5.0 (2007) (Informative)	Ed 6.0 (20??) (Informative)	Clause / Sub-Clause Title (Normative)	Group I and Group II	Group III	
25	25	Compliance of prototype or sample with documents	Applies	Applies	Applies
26.1	26.1	General	Applies	Applies	Applies
26.2	26.2	Test configuration	Applies	Applies	Applies
26.3	26.3	Tests in explosive test mixtures	Applies	Applies	Applies
26.4.1	26.4.1	Order of tests	see Note 1	see Note 2	see Note 1
26.4.1.1	26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass parts of enclosures	see Note 1	see Note 2	see Note 1
26.4.1.2	26.4.1.2	Non-metallic enclosures or parts of enclosures	see Note 1	see Note 2	see Note 1
26.4.1.2.1	26.4.1.2.1	Group I electrical equipment	see Note 1	Excluded	see Note 1
26.4.1.2.2	26.4.1.2.2	Group II and Group III electrical equipment	see Note 1	see Note 2	see Note 1
26.4.2	26.4.2	Resistance to impact	see Note 1	see Note 2	see Note 1
26.4.3	26.4.3	Drop test	Applies	Applies	see Note 1
26.4.4	26.4.4	Acceptance criteria	see Note 1	see Note 2	see Note 1
26.4.5	26.4.5	Degree of protection by enclosure	Applies	Applies	Applies
26.5.1.1	26.5.1.1	General	Applies	Applies	Excluded
26.5.1.2	26.5.1.2	Service temperature	Modified	Modified	Modified
26.5.1.3	26.5.1.3	Maximum surface temperature	Modified	Modified	Modified
26.5.2	26.5.2	Thermal shock test	see Note 1	see Note 2	see Note 1
26.5.3	26.5.3	Small component ignition test (Group I and Group II)	Applies	Excluded	Excluded
26.6	26.6	Torque test for bushings	Excluded	Excluded	Excluded
26.7	26.7	Non-metallic enclosures or non-metallic parts of enclosures	see Note 1	see Note 2	see Note 1
26.8	26.8	Thermal endurance to heat	see Note 1	see Note 2	see Note 1
26.9	26.9	Thermal endurance to cold	see Note 1	see Note 2	see Note 1
26.10	26.10	Resistance to light	see Note 1	see Note 2	see Note 1
26.11	26.11	Resistance to chemical agents for Group I electrical equipment	see Note 1	Excluded	Excluded
26.12	26.12	Earth continuity	Excluded	Excluded	Excluded

Clause or subclause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-11		
			Intrinsically safe apparatus		Associated apparatus
Ed 5.0 (2007) (Informative)	Ed 6.0 (20??) (Informative)	Clause / Sub-Clause Title (Normative)	Group I and Group II	Group III	
26.13	26.13	Surface resistance test of parts of enclosures of non-metallic materials	Applies	Applies	Excluded
26.15	26.14	Measurement of capacitance	Applies	Applies	Excluded
NR	26.15	Verification of ratings of ventilating fans	Excluded	Excluded	Excluded
NR	26.16	Alternative qualification of elastomeric sealing O-rings	see Note 1	see Note 2	see Note 1
27	27	Routine tests	Applies	Applies	Applies
28	28	Manufacturers responsibility	Applies	Applies	Applies
29	29	Marking	Applies	Applies	Applies
30	30	Instructions	Applies	Applies	Applies
Annex A	Annex A	Supplementary requirements for Ex cable glands	Excluded	Excluded	Excluded
Annex B	Annex B	Requirements for Ex components	Applies	Applies	Applies
Annex C	Annex C	Example of rig for resistance to impact test	Applies	Applies	Excluded
Annex D	Annex D	Alternative risk assessment method encompassing "equipment protection levels" for Ex equipment	Applies	Applies	Applies
Annex E	Annex E	Motors supplied by converters	Excluded	Excluded	Excluded
NR	Annex F	Temperature rise testing of electric machines	Excluded	Excluded	Excluded
NR	Annex G	Guideline flowchart for tests of non-metallic enclosures or non-metallic parts of enclosures (26.4)	see Note 1	see Note 2	see Note 1
<p>Applies – This requirement of IEC 60079-0 is applied without change.</p> <p>Excluded – This requirement of IEC 60079-0 does not apply.</p> <p>Modified – This requirement of IEC 60079-0 is modified as detailed in this standard.</p>					
<p>Note 1: Excluded except when 6.1.1.2 a) of this Standard (60079-11) is applied</p> <p>Note 2: Excluded except when 6.1.2 a) of this Standard (60079-11) is applied</p> <p>NOTE 3 The clause number in the above table is shown for information only. The applicable requirements of IEC 60079-0 are identified by the Clause title which is normative. This document was written against the specific requirements of IEC 60079-0 Ed 6.0. The clause numbers for the previous edition are shown for information only. This is to enable the General Requirements IEC 60079-0 Ed 5.0 to be used where necessary with this part of IEC 60079. Where there were no requirements, indicated by NR or there is a conflict between requirements, the later edition requirements take precedence.</p>					

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60079. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60079-0, *Explosive atmospheres – Part 0: Equipment – General requirements*

IEC 60079-7, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*

IEC 60079-25, *Electrical apparatus for explosive gas atmospheres – Part 25: Intrinsically safe systems)*

IEC 60085, *Electrical insulation – Thermal classification*

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

IEC 60127 (all parts), *Miniature fuses*

IEC 60317-3, *Specifications for particular types of winding wires – Part 3: Polyester enamelled round copper wire, class 155*

IEC 60317-7, *Specifications for particular types of winding wires – Part 7: Polyimide enamelled round copper wire, class 220*

IEC 60317-8, *Specifications for particular types of winding wires – Part 8: Polyesterimide enamelled round copper winding wire, class 180*

IEC 60317-13, *Specifications for particular types of winding wires – Part 13: Polyester or polyesterimide overcoated with polyamideimide enamelled round copper wire, class 200*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3:2003, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

ANSI/UL 248-1, *Low-Voltage Fuses – Part 1: General Requirements*

IEC 61158-2, *Digital data communications for measurement and control – Fieldbus for use in industrial control systems - Part 2: Physical layer specification and service definition*

UL1642, *Standard for Lithium Batteries*

IEC62133, *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications*

IEC 62013-1, *Caplights for use in mines susceptible to firedamp — Part 1: General requirements — Construction and testing in relation to the risk of explosion*