

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Explosive atmospheres –
Part 0: Equipment – General requirements**

**Atmosphères explosives –
Partie 0: Matériel – Exigences générales**

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60079-0-2011



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EXPLOSIVE ATMOSPHERES –

Part 0: Equipment – General requirements

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by technical committee 31: Equipment for explosive atmospheres, of IEC.

The text of this interpretation sheet is based on the following documents.

ISH	Report on voting
31/1085/ISH	31/1095/RVD

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

Interpretation of Annex A

Questions:

Is the torque used for the tensile test of A.3.1.4 required to be the same torque as the initial torque determined in A.3.1.1?

At what point in the testing sequence is the thermal endurance to heat test conducted?

Interpretation:

In A.3.1.1, a torque is applied to either the screws of a flanged compression element or the nut of a screwed compression element to compress the sealing ring to secure the mandrel. A tensile force is then applied to the mandrel to confirm the securement. The tensile force is applied for not less than 6 h. The test is carried out at an ambient temperature of $(20 \pm 5) ^\circ\text{C}$. The torque value needed for clamping to be assured by the sealing ring is acceptable if the slippage of the mandrel or cable sample as a result of the tensile force is not more than 6 mm.

Subsequently, either the complete cable gland and mandrel assembly used for the determination described above, or a new sample prepared using the same torque values, is then to be subjected to the thermal endurance tests. The maximum service temperature is considered to be $75 ^\circ\text{C}$ unless otherwise specified by the manufacturer.

NOTE 1 The $75 ^\circ\text{C}$ service temperature is the median of the branching point and entry point temperatures.

NOTE 2 Cable glands employing only metallic sealing rings and metallic parts do not require thermal endurance tests.

The subsequent test conditions and acceptance criteria are given in A.3.1.4. Prior to the application of the tensile force, the gland may be re-tightened in accordance with the manufacturer's instructions.

NOTE The torque applied to the screws or nut during retightening is not required to be the same as the initial torque applied in A.3.1.1.

In A.3.1.5, the “value needed to prevent slipping” is the torque required for A.3.1.4.

It is intended that this interpretation will be introduced in IEC 60079-0 Edition 7 and therefore an Interpretation Sheet will not be required for this or future editions.

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EXPLOSIVE ATMOSPHERES –

Part 0: Equipment – General requirements

INTERPRETATION SHEET 2

This interpretation sheet has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
31/1132/ISH	31/1153/RVISH

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

Following decision No 16 of the TC 31 meeting in Melbourne in 2011, the issuing of an Interpretation Sheet for IEC 60079-0:2011 (6th edition) was requested, in order to clarify the significance of the changes with respect to the 5th edition.

Question

What are the minor editorial, extensions, and major technical changes of the 6th edition with respect to the 5th edition?

Answer

The following table shows the significance of the changes.

The significance of the changes between IEC Standard, IEC 60079-0, Edition 5, 2007-10 (Including Corrigendum No.1 and Interpretation Sheet I-SH 01) and IEC 60079-0, Edition 6, 2011-06 are as listed below:

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Expansion of material specification data for plastics and elastomers, including UV resistance	7.1.2		x	
Addition of alternative qualification for O-rings	7.2.3		x	
Addition of alternative criteria for surface resistance	7.4.2 a)		x	
Addition of alternative breakdown voltage limit for non-metallic layers applied to metallic enclosures	7.4.2 c)		x	
Expansion of "X" marking options for non-metallic enclosure materials not meeting basic electrostatic requirements	7.4.2 d) 7.4.2 e)		x	
Clarification that non-metallic enclosure requirements also apply to painted or coated metal enclosures	7.4.3		x	
Clarification of test to determine capacitance of accessible metal parts with reduction in acceptable capacitance	7.5 Table 9			C1
Addition of limits on zirconium content for Group III and Group II (Gb only) enclosures	8.3 8.4		x	
Introduction of "X" marking for Group III enclosures not complying with basic material requirements, similar to that existing for Group II	8.4	x		
Addition of button-head cap screws to permitted "Special Fasteners"	9.2		x	
Reference for protective earthing (PE) requirements for electrical machines to IEC 60034-1	15.3	x		
Addition of requirements for ventilating fans	17.1.5			C2
Addition of requirement for temperature rating of bearing lubricants	17.2	x		
Addition of alternative construction for disconnectors	18.2		x	
Removal of voltage limits on plugs and sockets	20.2		x	
Addition of test requirements for arc-quenching test on plugs and sockets	20.2			C3
Additional information on cell voltages	23.3 Table 12			C4
Revision to impact test of glass parts	26.4.2	x		
Revision to impact test procedure to address "bounce" of impact head	26.4.2		x	
Clarification of the test requirements for "service" and "surface" temperature	26.5.1.2 26.5.1.3	x		
Clarification of temperature rise tests for converter-fed motors	26.5.1.3		x	
Addition of alternative test method for thermal endurance	26.8 Table 15		x	
Removal of "charging test" and addition of note providing guidance	Formerly 26.14			C5
Clarification of test for the measurement of capacitance, revision of maximum capacitance	26.14			C6
Addition of tests for ventilating fans	26.15			C2
Addition of alternative o-ring testing	26.16		x	
Addition of a "Schedule of Limitations" to	28.2	x		

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
certificates for Ex Components				
Clarification of the marking for multiple temperature classes	29.4 d) 29.5 d)	x		
Addition of marking for converter-fed motors	29.15		x	
Removal of IP marking for Group III	29.5	x		
Addition of specific instructions for electrical machines and for ventilating fans	30.3 30.4		x	

NOTE The technical changes referred to include the significance of technical changes in the revised IEC Standard, but they do not form an exhaustive list of all modifications from the previous version. More guidance may be found by referring to the Redline Version of the standard.

Explanation of the Types of Changes:

A) Definitions

1. Minor and editorial changes:

- Clarification
- Decrease of technical requirements
- Minor technical change
- Editorial corrections

These are changes which modify requirements in an editorial or a minor technical way. They include changes of the wording to clarify technical requirements without any technical change, or a reduction in level of existing requirement.

2. Extension:

Addition of technical options

These are changes which add new or modify existing technical requirements, in a way that new options are given, but without increasing requirements for equipment that was fully compliant with the previous standard. Therefore, these will not have to be considered for products in conformity with the preceding edition.

3. Major technical changes:

- addition of technical requirements
- increase of technical requirements

These are changes to technical requirements (addition, increase of the level or removal) made in a way that a product in conformity with the preceding edition will not always be able to fulfil the requirements given in the later edition. These changes have to be considered for products in conformity with the preceding edition. For these changes additional information is provided in clause B) below.

NOTE These changes represent current technological knowledge. However, these changes should not normally have an influence on equipment already placed on the market.

B) Information about the background of 'Major technical changes'

C1 – The values in the table have been significantly reduced based on information that is intended to be published in IEC TS 60079-32-1 (currently in preparation).

C2 – The requirements for fans was added at the request of the IECEx International Product Certification Scheme.

C3 – The test has been introduced for all disconnectors as an alternative to the voltage and current restrictions in the previous standard which were considered to be arbitrary.

C4 – There has been a slight increase in some cell voltages. This is a minor change for most protection concepts but should be regarded as a major change for equipment having a type of protection relying on energy limitation, e.g. IEC 60079-11

C5 – The charging test was removed as it had been found to be not repeatable. Guidance will be given in IEC TS 60079-32-1 (currently in preparation).

C6 – The limits for capacitance have been decreased based on technical information in CLC/TR 50404.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 60079-0
Edition 6.0 2011-06

EXPLOSIVE ATMOSPHERES –

Part 0: Equipment – General requirements

INTERPRETATION SHEET 3

This interpretation sheet has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

FDIS	Report on voting
31/1376/FDIS	31/1386/RVD

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

Question:

How shall marking be shown for equipment covered by both the electrical and non-electrical standards (IEC 60079 and ISO 80079 series)?

Answer:

Equipment which includes both an electrical part and a non-electrical part shall have combined marking. For example:

Ex db h IIA T4 Gb

Ex h tb IIIC T135 °C Db

It will be clearer for the user that the combined risk of the electrical part and the non-electrical part, covered by a single certificate, has been assessed for the complete equipment, stating one EPL, one equipment Group and one temperature class for Gas and the same for Dust (but showing a maximum surface temperature instead of a temperature class). It is also noted that Ex Components are not marked with either a temperature class (Group II) or a maximum surface temperature (Group III).

For equipment where separate certificates have been prepared, with one for the electrical parts, and one for the non-electrical parts, it is appropriate to have separate electrical and non-electrical marking strings, each with its own associated certificate number.

NOTE Additional guidance on the marking of assemblies is given in IEC TS 60079-46.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 60079-0
Edition 6.0 2011-06

EXPLOSIVE ATMOSPHERES –

Part 0: Equipment – General requirements

INTERPRETATION SHEET 4

This interpretation sheet has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

DISH	Report on voting
31/1454/DISH	31/1465/RVDISH

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

Interpretation sheet of Subclause 16.6 of IEC 60079-0:2011

The TC 31/CAG requested (Resolution 2 of 2018-04-19) that WG 22 prepare an interpretation sheet based on IECEx Decision Sheet DS2018/002 addressing the assignment of entry point and branching point temperatures of electrical rotating machines.

This interpretation is made available for Edition 6 of this standard due to the current use of that standard by manufacturers, conformity assessment schemes and national bodies by means of this “Interpretation Sheet” as follows:

Details of interpretation:**IEC 60079-0:2011 (Ed. 6), Explosive atmospheres – Part 0: Equipment – General requirements****Interpretation of Subclause 16.6, Temperature at branching point and entry point:**

Question: Subclause 16.6 of IEC 60079-0:2011 (Ed. 6) states “When the temperature under rated conditions is higher than 70 °C at the entry point or 80 °C at the branching point of the conductors, information shall be marked on the equipment exterior to provide guidance to the user on the proper selection of cable and cable gland or conductors in conduit.”

It is not normal practice for electrical rotating machines to be tested with the cable entry devices and cables that might be used in an actual installation, but with the cables available at the manufacturer’s test area. In many cases, there will be no formal entry device as the cables will enter via the space reserved for fixing of a gland plate.

How shall the relevant entry point and branching point temperatures be determined?

Interpretation: *The use of the maximum internal air space temperature to represent the maximum service temperature of terminal box gaskets and seals, the cable branching point temperature, and the entry point temperature reflects the normal practice of testing electrical rotating machines without prior knowledge of the actual glands and cables to be used for installation. The production of heat from the electrical rotating machine connections is generally insignificant with respect to the production of heat from the machine windings and core.*

Further amplification:

- 1) The entry point of the cable where the temperature is measured should be sealed so far as possible to ensure that there is minimum air-circulation which can reduce the measured temperature.
- 2) This is not intended to apply to any gasket between the terminal box and the frame of the electrical rotating machine, where higher temperatures may be recorded, but only to the gasket between the terminal box and its lid.

Although written in the context of electrical rotating machines, there may be other types of equipment where an equivalent approach is applicable.

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CONTENTS

FOREWORD.....	7
1 Scope.....	10
2 Normative references	11
3 Terms and definitions	14
4 Equipment grouping	26
4.1 Group I.....	26
4.2 Group II.....	26
4.3 Group III.....	26
4.4 Equipment for a particular explosive atmosphere.....	27
5 Temperatures	27
5.1 Environmental influences	27
5.1.1 Ambient temperature	27
5.1.2 External source of heating or cooling.....	27
5.2 Service temperature	27
5.3 Maximum surface temperature	28
5.3.1 Determination of maximum surface temperature.....	28
5.3.2 Limitation of maximum surface temperature.....	28
5.3.3 Small component temperature for Group I or Group II electrical equipment	29
6 Requirements for all electrical equipment	30
6.1 General.....	30
6.2 Mechanical strength of equipment.....	30
6.3 Opening times.....	30
6.4 Circulating currents in enclosures (e.g. of large electrical machines).....	31
6.5 Gasket retention.....	31
6.6 Electromagnetic and ultrasonic energy radiating equipment	31
6.6.1 Radio frequency sources	31
6.6.2 Lasers or other continuous wave sources	32
6.6.3 Ultrasonic sources	33
7 Non-metallic enclosures and non-metallic parts of enclosures	33
7.1 General.....	33
7.1.1 Applicability.....	33
7.1.2 Specification of materials.....	33
7.2 Thermal endurance	34
7.2.1 Tests for thermal endurance	34
7.2.2 Material selection	34
7.2.3 Alternative qualification of elastomeric sealing O-rings.....	34
7.3 Resistance to light.....	34
7.4 Electrostatic charges on external non-metallic materials.....	35
7.4.1 Applicability.....	35
7.4.2 Avoidance of a build-up of electrostatic charge on Group I or Group II electrical equipment	35
7.4.3 Avoidance of a build-up of electrostatic charge on equipment for Group III.....	37
7.5 Accessible metal parts	37
8 Metallic enclosures and metallic parts of enclosures.....	38

8.1	Material composition	38
8.2	Group I.....	38
8.3	Group II.....	38
8.4	Group III.....	39
9	Fasteners	39
9.1	General.....	39
9.2	Special fasteners.....	39
9.3	Holes for special fasteners	40
9.3.1	Thread engagement	40
9.3.2	Tolerance and clearance	40
9.3.3	Hexagon socket set screws	41
10	Interlocking devices.....	41
11	Bushings	41
12	Materials used for cementing.....	41
13	Ex Components	42
13.1	General.....	42
13.2	Mounting	42
13.3	Internal mounting	42
13.4	External mounting	42
13.5	Ex Component certificate	42
14	Connection facilities and termination compartments	43
14.1	General.....	43
14.2	Termination compartment.....	43
14.3	Type of protection	43
14.4	Creepage and clearance	43
15	Connection facilities for earthing or bonding conductors	43
15.1	Equipment requiring earthing.....	43
15.1.1	Internal.....	43
15.1.2	External.....	43
15.2	Equipment not requiring earthing.....	43
15.3	Size of conductor connection.....	44
15.4	Protection against corrosion	44
15.5	Secureness of electrical connections.....	44
16	Entries into enclosures	44
16.1	General.....	44
16.2	Identification of entries	44
16.3	Cable glands	45
16.4	Blanking elements.....	45
16.5	Thread adapters.....	45
16.6	Temperature at branching point and entry point.....	45
16.7	Electrostatic charges of cable sheaths	46
17	Supplementary requirements for rotating machines	46
17.1	Ventilation	46
17.1.1	Ventilation openings	46
17.1.2	Materials for external fans	47
17.1.3	Cooling fans of rotating machines.....	47
17.1.4	Auxiliary motor cooling fans.....	47
17.1.5	Ventilating fans.....	47