Edition 8.0 2026-06

INTERNATIONAL STANDARD

Explosive atmospheres -
Part 0: Equipment - General requirements

ICS 29.260.20

ISBN 978-2-8327-1253-5

IEC 60079-0:2026-06(en)

Explosive atmospheres - Part 0: Equipment - General requirements

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60079-0 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres. It is an International Standard.

This eighth edition cancels and replaces the seventh edition, published in 2017. This edition constitutes a technical revision.

Users of this document are advised that interpretation sheets clarifying the interpretation of this document can be published. Interpretation sheets are available from the IEC webstore and can be found in the "history" tab of the page for each document.

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

Draft	Report on voting
31/1958/FDIS	31/1968/RVD

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

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

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

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

stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

This part of IEC 60079 specifies the general requirements for construction, testing and marking of Ex Equipment and Ex Components intended for use in or associated with explosive atmospheres.

The standard atmospheric conditions (relating to the explosion characteristics of the atmosphere) for Ex Equipment are:

– temperature −20 °C to +60 °C;
– pressure 80 kPa (0,8 bar) to 110 kPa (1,1 bar); and
– air with normal oxygen content, typically a volume fraction of 21 %.

This part of IEC 60079 and other documents supplementing this document specify additional test requirements for Ex Equipment operating outside the standard temperature range, but in some cases, further additional consideration and additional testing is required for Ex Equipment operating outside the standard atmospheric pressure range and standard oxygen content. Such additional testing is particularly relevant with respect to Types of Protection that depend on quenching of a flame such as 'flameproof enclosures "d"' (IEC 60079-1) or limitation of energy, 'intrinsic safety "i"' (IEC 60079-11).

NOTE 1 Although the standard atmospheric conditions above give a temperature range for the atmosphere of −20 °C to +60 °C, the normal ambient temperature range for the Ex Equipment is −20 °C to +40 °C, unless otherwise specified and marked. See 5.1.1. It is considered that −20 °C to +40 °C is appropriate for many items of Ex Equipment and that to manufacture all Ex Equipment to be suitable for a standard atmosphere upper ambient temperature of +60 °C would place unnecessary design constraints.

NOTE 2 Requirements given in this document result from an ignition hazard assessment made on equipment. The ignition sources taken into account are those found associated with this type of equipment, such as hot surfaces, electromagnetic radiation, mechanically generated sparks, mechanical impacts resulting in thermite reactions, electrical arcing and static electric discharge in normal industrial environments.

NOTE 3 Where an explosive gas atmosphere and a combustible dust atmosphere are, or can be, present at the same time, the simultaneous presence of both often warrants additional protective measures. Additional guidance on the use of Ex Equipment in hybrid mixtures (mixture of a flammable gas or vapour with a combustible dust or combustible flyings) is given in IEC 60079-14.

NOTE 4 Any short-term thermal excursions that occur as a result of electrical current excursions above normal rated currents, such as those that occur during the starting of motors, are not considered to create a significant possibility of ignition of an explosive atmosphere due to the relatively short duration of the event and the convection that occurs during the event.

IEC 60079 does not specify requirements for safety, other than those directly related to the reduction (mitigation) of ignition hazards.

Ignition sources like adiabatic compression, shock waves, exothermic chemical reaction, self-ignition of dust, naked flames and hot gases/liquids, are not addressed by this document.

NOTE 5 Although outside the scope of this document, such equipment would typically be subjected to an ignition hazard assessment that identifies and lists all of the potential sources of ignition by the equipment and the measures to be applied to prevent them becoming effective. See ISO 80079-36.

ISO/IEC 80079 series:

- IEC 60079-1: *Gas - Flameproof enclosures "d"*
- IEC 60079-2: *Gas and dust - Pressurized enclosure "p"*
- IEC 60079-5: *Gas - Powder filling "q"*
- IEC 60079-6: *Gas - Liquid immersion "o"*
- IEC 60079-7: *Gas - Increased safety "e"*
- IEC 60079-11: *Gas and dust - Intrinsic safety "i"*
- IEC 60079-13: *Gas and dust - Equipment protection by pressurized room "p" & artificially ventilated room "v"*
- IEC 60079-15: *Gas - Type of protection "n"*
- IEC 60079-18: *Gas and dust - Encapsulation "m"*
- IEC 60079-25: *Gas and dust - Intrinsically safe electrical systems*
- IEC 60079-26: *Gas and dust - Equipment with Separation Elements or combined Levels of Protection*
- IEC 60079-28: *Gas and dust - Protection of equipment and transmission systems using optical radiation*
- IEC 60079-29-0: *Gas - Gas detection equipment - General requirements and test methods*
- IEC 60079-29-1: *Gas detectors - Performance requirements of detectors for flammable gases*
- IEC 60079-29-4: *Gas detectors - Performance requirements of open path detectors for flammable gases*
- IEC/IEEE 60079-30-1: *Gas and dust - Electrical resistance trace heating - General and testing requirements*
- IEC 60079-31: *Dust - Protection by enclosure "t"*
- IEC 60079-33: *Gas and dust - Special protection "s"*
- IEC 60079-35-1: *Caplights for use in mines susceptible to firedamp - General requirements - Construction and testing in relation to the risk of explosion*
- IEC TS 60079-39: *Gas - Intrinsically safe systems with electronically controlled spark duration limitation*
- IEC TS 60079-40: *Gas - Requirements for process sealing between flammable process fluids and electrical systems*
- IEC TS 60079-46: *Gas and dust - Equipment assemblies*
- IEC TS 60079-47: *Gas and dust - Equipment protection by 2-wire intrinsically safe Ethernet concept (2-WISE)*
- IEC 62784: *Dust - Vacuum cleaners and dust extractors providing EPL Dc*
- ISO 80079-36: *Gas and dust - Non-electrical equipment for explosive atmospheres - Basic method and requirements*
- ISO 80079-37: *Gas and dust - Non-electrical equipment for explosive atmospheres - Non electrical Type of Protection constructional safety "c", control of ignition source "b", liquid immersion "k"*

This document, along with the additional parts of IEC 60079 and ISO/IEC 80079 mentioned above, is not applicable to the construction of

- electromedical apparatus,
- shot-firing exploders,
- test devices for exploders, and
- shot-firing circuits.

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60034-1, *Rotating electrical machines - Part 1: Rating and performance*

IEC 60034-5, *Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification*

IEC 60079-1, *Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"*

IEC 60079-26, *Explosive atmospheres - Part 26: Equipment with Separation Elements or combined Levels of Protection*

IEC 60086-1:2021, *Primary batteries - Part 1: General*

IEC 60192, *Low-pressure sodium vapour lamps - Performance specifications*

IEC 60216-1, *Electrical insulating materials - Thermal endurance properties - Part 1: Ageing procedures and evaluation of test results*

IEC 60216-2, *Electrical insulating materials - Thermal endurance properties - Part 2: Determination of thermal endurance properties of electrical insulating materials - Choice of test criteria*

IEC 60243-1, *Electric strength of insulating materials - Test methods - Part 1: Tests at power frequencies*

IEC 60243-2, *Electric strength of insulating materials - Test methods - Part 2: Additional requirements for tests using direct voltage*

IEC 60423, *Conduit systems for cable management - Outside diameters of conduits for electrical installations and threads for conduits and fittings*

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

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

IEC 60947-1, *Low-voltage switchgear and controlgear - Part 1: General rules*

IEC 62626-1, *Low-voltage switchgear and controlgear enclosed equipment - Part 1: Additional requirements for enclosed switch-disconnectors in accordance with IEC 60947-3 - Isolation of electrical equipment during repair and maintenance work in specific applications*

ISO 48-2, *Rubber, vulcanized or thermoplastic - Determination of hardness - Part 2: Hardness between 10 IRHD and 100 IRHD*

ISO 178, *Plastics - Determination of flexural properties*

ISO 179 (all parts), *Plastics - Determination of Charpy impact properties*

and nuts

ISO 273, *Fasteners - Clearance holes for bolts and screws*

ISO 527-2, *Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics*

ISO 965-1, *ISO general purpose metric screw threads - Tolerances - Part 1: Principles and basic data*

ISO 965-3, *ISO general purpose metric screw threads - Tolerances - Part 3: Limit deviations for screw threads*

ISO 3601-1, *Fluid power systems - O-rings - Part 1: Inside diameters, cross-sections, tolerances and designation codes*

ISO 3601-2, *Fluid power systems - O-rings - Part 2: Housing dimensions for general applications*

ISO 4014, *Fasteners - Hexagon head bolts - Product grades A and B*

ISO 4017, *Fasteners - Hexagon head screws - Product grades A and B*

ISO 4026, *Hexagon socket set screws with flat point*

ISO 4027, *Hexagon socket set screws with cone point*

ISO 4028, *Hexagon socket set screws with dog point*

ISO 4029, *Hexagon socket set screws with cup point*

ISO 4032, *Fasteners - Hexagon regular nuts (style 1)*

ISO 4762, *Hexagon socket head cap screws*

ISO 4892-2, *Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps*

ISO 7380-1, *Fasteners -Button head screws with reduced loadability - Part 1: Hexagon socket button head screws*

ISO 14583, *Hexalobular socket pan head screws*

ISO/IEC 80079-20-1, *Explosive atmospheres - Part 20-1: Material characteristics for gas and vapour classification - Test methods and data*

ANSI/UL 746B, *Polymeric Materials - Long-Term Property Evaluations*

ANSI/UL 746C, *Polymeric Materials - Used in Electrical Equipment Evaluations*

ASTM D5964, *Standard practice for rubber IRM 901, IRM 902, and IRM 903 replacement oils for ASTM No. 1, ASTM No. 2, and ASTM No. 3*

IEC 60034-11, *Rotating electrical machines - Part 1: Rating and performance*

IEC TS 60034-25, *Rotating electrical machines - Part 25: AC electrical machines used in power drive systems - Application guide*

IEC 60034-29, *Rotating electrical machines - Part 29: Equivalent loading and superposition techniques - Indirect testing to determine temperature rise*

IEC 60050-426, *International Electrotechnical Vocabulary (IEV) - Part 426: Explosive atmospheres*

IEC 60079-2, *Explosive atmospheres - Part 2: Equipment protection by pressurized enclosure "p"*

IEC 60079-5, *Explosive atmospheres - Part 5: Equipment protection by powder filling "q"*

IEC 60079-6, *Explosive atmospheres - Part 6: Equipment protection by liquid immersion "o"*

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

IEC 60079-10-1, *Explosive atmospheres - Part 10-1: Classification of areas - Explosive gas atmospheres*

IEC 60079-10-2, *Explosive atmospheres - Part 10-2: Classification of areas - Explosive dust atmospheres*

IEC 60079-11, *Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"*

IEC 60079-13, *Explosive atmospheres - Part 13: Equipment protection by pressurized room "p" and artificially ventilated room "v"*

IEC 60079-14, *Explosive atmospheres - Part 14: Electrical installation design, selection and installation of equipment, including initial inspection*

IEC 60079-15, *Explosive atmospheres - Part 15: Equipment protection by type of protection "n"*

IEC 60079-17, *Explosive atmospheres - Part 17: Electrical installations inspection and maintenance*

IEC 60079-18, *Explosive atmospheres - Part 18: Equipment protection by encapsulation "m"*

IEC 60079-19, *Explosive atmospheres - Part 19: Equipment repair, overhaul and reclamation*

IEC 60079-25, *Explosive atmospheres - Part 25: Intrinsically safe electrical systems*

IEC 60079-28, *Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation*

IEC 60079-29-1, *Explosive atmospheres - Part 29-1: Gas detectors - Performance requirements of detectors for flammable gases*

IEC 60079-29-4, *Explosive atmospheres - Part 29-4: Gas detectors - Performance requirements of open path detectors for flammable gases*

General and testing requirements

IEC 60079-31, *Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"*

IEC TS 60079-32-1, *Explosive atmospheres - Part 32-1: Electrostatic hazards, guidance*

IEC 60079-35-1, *Explosive atmospheres - Part 35-1: Caplights for use in mines susceptible to firedamp - General requirements - Construction and testing in relation to the risk of explosion*

IEC TS 60079-39, *Explosive atmospheres - Part 39: Intrinsically safe systems with electronically controlled spark duration limitation*

IEC TS 60079-42, *Explosive atmospheres - Part 42: Electrical safety devices for the control of potential ignition sources for Ex-Equipment*

IEC TS 60079-43, *Explosive atmospheres - Part 43: Equipment in adverse service conditions*

IEC TS 60079-46, *Explosive atmospheres - Part 46: Equipment assemblies*

IEC TS 60079-47, *Explosive atmospheres - Part 47: Equipment protection by 2-wire intrinsically safe ethernet concept (2-WISE)*

IEC 60095-1, *Lead-acid starter batteries - Part 1: General requirements and methods of test*

IEC 60254 (all parts), *Lead-acid traction batteries*

IEC 60622, *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Sealed nickel-cadmium prismatic rechargeable single cells*

IEC 60623, *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Vented nickel-cadmium prismatic rechargeable single cells*

IEC 60662, *High-pressure sodium vapour lamps - Performance specifications*

IEC 60896-11, *Stationary lead-acid batteries - Part 11: Vented types - General requirements and methods of tests*

IEC 60896-21, *Stationary lead-acid batteries - Part 21: Valve regulated types - Methods of test*

IEC 60952 (all parts), *Aircraft batteries*

IEC 61056-1, *General purpose lead-acid batteries (valve-regulated types) - Part 1: General requirements, functional characteristics - Methods of test*

IEC TR 61340-1, *Electrostatics - Part 1: Electrostatic phenomena - Principles and measurements*

IEC 61406-1, *Identification Link - Part 1: General requirements*

IEC 61427 (all parts), *Secondary cells and batteries for renewable energy storage - General requirements and methods of test*

Secondary sealed cells and batteries for portable applications - Part 1: Nickel-cadmium

IEC 61951-2, *Secondary cells and batteries containing alkaline or other non acid electrolytes - Secondary sealed cells and batteries for portable applications - Part 2: Nickel-metal hydride*

IEC 61960 (all parts), *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium cells and batteries for portable applications*

IEC 62443 (all parts), *Security for industrial automation and control systems*

IEC 62784, *Vacuum cleaners and dust extractors providing equipment protection level Dc for the collection of combustible dusts - Particular requirements*

IEC 63365, *Industrial process measurement, control and automation - Digital nameplate*

ISO/IEC 17000, *Conformity assessment - General vocabulary and general principles*

ISO/IEC 80079-20-1, *Explosive atmospheres - Part 20-1: Material characteristics for gas and vapour classification - Test methods and data*

ISO/IEC 80079-20-2, *Explosive atmospheres - Part 20-2: Material characteristics - Combustible dusts test methods*

ISO/IEC 80079-34, *Explosive atmospheres - Part 34: Application of quality systems for Ex product manufacture*

ISO 4225: 1994, *Air quality - General aspects - Vocabulary*

ISO 10807, *Pipework - Corrugated flexible metallic hose assemblies for the protection of electrical cables in explosive atmospheres*

IECEx OD-017, *IEC System for Certification to Standards relating to Equipment for use in Explosive Atmospheres*

ANSI/ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*

CLC/TR50427, *Assessment of inadvertent ignition of flammable atmospheres by radio-frequency radiation - Guide*

IEEE 1349:2021, *IEEE Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations*

IEEE/PCIC-2002-08, I*nverter driven induction motor bearing current solutions*, 49th Annual IEEE Petroleum and Chemical Industry Conference, 23-25 Sept. 2002, pp. 67-75, R.F. Schiferl, M. J. Melfi, J. S. Wang

IEEE Transactions on industry applications, Vol. 49 (6), 2451-2460 2013, *Are lithium ion cells intrinsically safe?,* Dubaniewicz, T.H., DuCarme, J.P.

IEEE Transactions on industry applications, Vol. 33 No. 2 March/April/1997; *PWM Drive Related Bearing Failures*, Don MacDonald and Will Gray; IEEE Pulp and Paper Industrial Technical Conference, 1998

ITU-R BS.561-2, *Definitions of radiation in LF, MF and HF broadcasting bands*

package family, includes addition of Very Thin Profile variations

2014/34/EU, *Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast)*

Linden's Handbook of Batteries, Thomas Reddy, McGraw Hill Professional

Journal of Loss Prev. in the Proc. Ind. 32, 165-173 2014, *Further study of the intrinsic safety of internally shorted lithium and lithium-ion cells within methane-air*, Dubaniewicz, T.H., DuCarme, J.P.

Journal of Loss Prev. in the Proc. Ind. 43, 575-584, 2016, Dubaniewicz, T.H., DuCarme, J.P. *Internal short circuit and accelerated rate calorimetry tests of lithium-ion cells: Considerations for methane-air intrinsic safety and explosion proof/flameproof protection methods*

Can a shaft brush be safely applied on a motor in a Class I hazardous location?, Melfi, M.J., Ladonne, F.G., Ankele, D.W., *IEEE Petroleum and Chemical Industry Technical Conference (PCIC),* 2014

Application considerations for class-1 div-2 inverter-fed motors, Paes, R.H., Lockley, B., Driscoll, T., Melfi, M.J., Rowe, V., Rizzo, S.C., *IEEE Transactions on Industry Applications,* Volume: 42, Issue: 1, 2006

Effect of PWM Inverters on AC Motor Bearing Currents and Shaft Voltages, Erdman, J. M. et al, *IEEE Transactions on Industry Applications,* Vol.32, No.2, pp.250-259, March/April 1996

System Electrical Parameters and Their Effects on Bearing Currents, Doyle Busse, Jay Erdman, Dave Schlegel, Gary Skibinski

_____