Indian Standard

ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES

PART 0 GENERAL REQUIREMENTS

1 Scope

This part of IEC 60079 specifies the general requirements for construction. testing and marking of electrical apparatus and Ex components intended for use in explosive gas atmospheres

Unless modified by one of the parts in the IEC 60079 series, electrical apparatus complying with this standard is intended for use in hazardous areas in which explosive gas atmospheres caused by mixtures of air and gases vapours or mists, exist under normal atmospheric conditions of

• temperature -20°C to +60 °C

• pressure 80 kPa (0.8 bar) to 110 kPa (1,1 ban. And

• air with normal oxygen content, typically 21 % v/v

The application of electrical apparatus in atmospheric conditions outside this range may need special consideration

NOTE 1 The determination of the maximum surface temperature is based on an operational ambient temperature of -20 ·C to + 40 ·C, If not otherwise specified by the manufacturer see also 5 1 1

NOTE 2 In designing apparatus for operation In explosive gas atmospheres under conditions other than the atmospheric conditions given above, this standard may be used as a guide However additional testing related specifically to the Intended conditions of use is recommended This is particularly important when the types of protection 'flameproof enclosures "d" (IEC 60079 1) and intrinsic safety "I" (IEC 60079-11) are applied

NOTE 3 Requirements given in this standard result from an ignition hazard assessment made on electrical equipment The ignition sources taken into account are those found associated with this type of equipment. such as hot surfaces, mechanically generated sparks thermite reactions electrical arcing and static electric discharge in normal industrial environments For other ignition sources like adiabatic compression, shock waves exothermic chemical reaction self ignition of dust, naked flames hot gases/liquids the apparatus are subjected to a hazard analysis that identifies and lists all of the potential sources of ignition by the electrical apparatus and the measures to be applied to prevent them becoming effective

This standard does not specify requirements for safety, other than those directly related to the explosion risk

This standard is supplemented or modified by the following parts of IEC 60079 concerning specific types of protection

— IEC 60079-1 Flameproof enclosures “d",
— IEC 60079-2 Pressurized enclosures “p",
— IEC 60079-5 Powder filling "q",
— IEC 60079-6 Oil immersion "o ",
— IEC 60079-7 Increased safety "e”,
— IEC 60079-11 intrinsic safety “I”,
— IEC 60079-15 Type of protection "n",
— IEC 60079-18 Encapsulation “m”

This standard is supplemented or modified by the following apparatus standards

IEC 60079-25
IEC 60079-26
IEC 62013-1
IEC 62086-1

This part of IEC 60079, along with other parts in the IEC 60079 series and the additional standards mentioned above, is not applicable to the construction of electromedical apparatus shot-firing exploders. test devices for exploders and for shot-firing circuits

2 Normative references

The following referenced documents are indispensable for the application 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 60034-5, *Rotating electrical machines - Per:* 5 *Degrees* of *protection provided by the Integral design* of *rotating electrical machines (IP code) – Classification*

IEC 60079-1, *Electrical apparatus for explosive gas atmospheres - Part* 1 *Flameproof enclosures "d"*

IEC 60079-2, *Electrical apparatus for explosive gas atmospheres - Part* 2 *Pressurized enclosures "p"*

IEC 60079-4, *Electrical apparatus for explosive gas atmospheres - Part* 4 *Method of test for ignition temperature*

IEC *60079-5 Electrical apparatus for explosive gas atmospheres - Part* 5 *Powder filling "q"*

IEC 60079-6, *Electrical apparatus for explosive gas atmospheres - Part* 6 *Oil-Immersion "0"*

IEC 60079-7, *Electrical apparatus for explosive gas atmospheres - Part* 7 *Increased safety* "e"

IEC 60079·10, *Electrical apparatus for explosive gas atmospheres - Part* 10 *Classification of hazardous areas*
IEC 60079-11, *Electrical apparatus for explosive gas atmospheres - Part* 11 I*ntrinsic safety "I"*

IEC 60079-15, *Electrical apparatus for explosive gas atmospheres - Part* 15 *Type of protection "n"*

IEC 60079-18, *Electrical apparatus for explosive gas atmospheres - Part* 18 *Encapsulation "m”*

IEC 60079-25 *Electrical apparatus for explosive gas atmospheres - Part* 25 *Intrinsically safe systems* [1]

IEC 60079-26 *Electrical apparatus for explosive* gas *atmospheres - Part* 26 *Construction,* test and *marking of* zone 0 *electrical apparatus* [2]

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

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

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

IEC 60216-1. *Electrical insulating materials - Properties of thermal endurance - Part* 1 *Ageing procedures* and *evaluation of test results*

IEC 60216-2 *Guide for the determination of thermal endurance properties of electrical Insulating materials - Part* 2 Choice *of test criteria*

IEC 60423, *Conduits for electrical purposes - Outside diameters of conduits for electrical installations and threads for conduits and fittings*

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

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*

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

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

IEC 61150, *Alkaline secondary cells and batteries - Sealed nickel-cadmium rechargeable monobioc batteries In button cell design*

IEC 61436, *Secondary cells and batteries containing alkaline or other non-acid electrolytes Sealed nickel-metal hydride rechargeable single cells*

IEC 61951-1, *Secondary cells and batteries containing alkalinel and other non-acid electrolytes - Portable sealed rechargeable single cells - Part* 1 *Nickel-cadmium*

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*

IEC 62086-1 *Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating - Part* 1 *General and testing requirements*

ISO 48, *Rubber, vulcanized or thermoplastic - Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 178, *Plastics - Determination of flexural properties*

ISO 179, *Plastics - Determination of Charpy Impact properties*

ISO 262, ISO *general-purpose metric screw threads - Selected sizes for screws, bolts and nuts*

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

ISO 286-2, *ISO system of limits and fits - Part* 2 *Tables of standard tolerance grades and limit deviations for holes and shafts*

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 *Deviations for constructional screw threads*

ISO 1817, *Rubber, vulcanized - Determination of the effect of liquids*

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

ISO 4017, *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, *Hexagon nuts, style* 1 *- Product grades* A *and B*

ISO 4762, *Hexagon socket head cap screws*

ISO 4892-1, *Plastics - Methods of exposure to laboratory light sources - Part* 1 *General guidance*

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