

ISA-S12.22.01-1998 (IEC 79-1 Mod)

Approved December 15, 1997

Standard



Electrical Apparatus for Use in Class I, Zone 1 Hazardous (Classified) Locations Type of Protection – *Flameproof* “d”



Certain provisions of this document differ from analogous provisions of ANSI/UL 2279. ISA and UL are actively working to harmonize these provisions and anticipate jointly publishing a single set of American National Standards when these differences are resolved.

ISA-S12.22.01—Electrical Apparatus for Use in Class I, Zone 1 Hazardous (Classified) Locations
Type of Protection – *Flameproof "d"*

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Preface

This ISA Standard is based on IEC Publication 79-1. It is the intention of the SP12.22 Subcommittee to develop an ANSI Standard that is harmonized with IEC 79-1 to the fullest extent possible.

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This is a preview of "ISA S12.22.01-1998 (...". [Click here to purchase the full version from the ANSI store.](#)

Contents

Foreword	11
1 Scope	13
2 Definitions	13
3 Grouping and temperature classification	15
4 Flameproof joints (joints)	15
4.1 General requirements	15
4.2 Non-threaded joints	15
4.3 Threaded joints	18
4.4 Gaskets and o-rings	18
4.5 Cemented joints	18
4.6 Labyrinth joints	19
4.7 Serrated joints	19
5 Operating rods (spindles)	19
6 Shafts and bearings	20
6.1 Sleeve bearings	20
6.2 Rolling-element bearings	20
6.3 Plain glands	20
7 Light-transmitting parts	21
7.1 Material	21
7.2 Mounting of light-transmitting parts	21
8 Breathing and draining devices	21
9 Fasteners	22
10 Mechanical strength of the enclosure	22
11 Connection of conductors and cables <u>Conduit and cable entries</u>	23
11.3 Indirect entry	24
11.4 Direct entry	24
12 Marking	25
13 General	26
14 Type tests	26
14.1 Tests of ability of the enclosure to withstand pressure	26
14.2 Tests for non-transmission of an internal ignition	29
15 Routine tests	31
Annex A (Normative) – Non-metallic parts of flameproof enclosures	49
A.1 Scope	49
A.2 Special constructional requirements	49
A.3 Supplementary requirements for type tests	49

Annex B – Breathing and draining devices (<u>Normative</u>)	55
B.1 Scope	55
B.2 General requirements	55
B.5 Elements with measurable paths	56
B.6 Additional requirements for crimped ribbon elements of breathing and draining devices	56
B.7 Elements with non-measurable paths	56
B.9 Mounting arrangements of the elements	59
B.10 Mechanical strength	59
B.11 Tests of flameproof enclosure with breathing and draining devices ..	60
ANNEX C (Informative) — U. S. major deviations	63

Foreword

All text of IEC 79-1 (with Amendment 1) is included. U.S. National Deviations are shown by ~~strikeout~~ through text deleted and underline under text added. Figures to be deleted are marked with the overlay "Figure Deleted." A note appears in the table title showing the table as added material. There are three annexes in this Standard. [Annex C](#) is Informative and is not considered part of this Standard. [Annexes A](#) and [B](#) are Normative and are considered part of this Standard.

Preface

The following documents may contain provisions which, through reference in this text constitute provisions of this standard. At the time of publication of this standard, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards. ANSI maintains registers of currently valid U.S. National Standards.

The following ~~IEC~~ publications are quoted in this standard:

Publications Nos.

~~IEC 79-0 (1983) Electrical apparatus for explosive atmospheres, Part 0: General requirements.~~

ISA S12.0.01 (IEC 79-0 MOD) Electrical apparatus for use in Class I, Zones 0 & 1, Hazardous (Classified) Locations - *General Requirements*.

ISA S12.16.01 (IEC 79-7 MOD) Electrical apparatus for use in Class I, Zone 1, Hazardous (Classified) Locations Type of Protection - *Increased Safety "e"*.

ISA-S12.1.01 (1991) — Definitions and Information Pertaining to Electrical Instruments in Hazardous (Classified) Locations.

IEC 79-1A (1975) First Supplement: Appendix D: Method of test for ascertainment of maximum experimental safe gap.

~~IEC 112 (1979) Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions.~~

IEC 707 (1992) — Methods of Test for the Determination of the Flammability of Solid Electrical Insulating Materials When Exposed to an Igniting Source.

Other publications quoted:

~~ISO Standard 179 (1982) Plastics — Determination of Charpy impact strength of rigid materials.~~

ISO Standard 468 (1982) Surface roughness – Parameters, their values and general rules for specifying requirements.

~~ISO Standard 965-1 (1989) ISO General purpose metric screw threads — Tolerances — Part 1: Principles and basic data.~~

~~ISO Standard 965-3 (1980) ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional threads.~~

ISO Standard 1210 (1982) Plastics – Determination of flammability characteristics of plastics in the form of small specimens in contact with a small flame.

~~ISO Standard 1817 Rubber, vulcanized — Determination of the effect of liquids.~~

ISO Standard 2738 (1987) Permeable sintered metal materials – Determination of density, oil content and open porosity.

ISO Standard 4003 (1977) Permeable sintered metal materials — Determination of bubble test pore size.

ISO Standard 4022 (1987) Permeable sintered metal materials – Determination of fluid permeability.

~~ISO Standard 4892 (1981) Plastics — Methods of exposure to laboratory light sources.~~

ANSI/ASME B1.1 (1989) — Unified Inch Screw Threads (UN and UNR Thread Form).

ANSI/ASME B1.20.1(1983) — Pipe Threads, General Purpose (Inch).

ANSI/ASME B46.1 (1985) — Standard for Surface Texture.

ANSI/ASTM E28 (1992) — Standard Test Method of Softening Point by Ring-and-Ball Apparatus.

ANSI/UL 746C (1989) — Polymeric Materials – Use in Electrical Equipment Evaluations.

For technical reasons, certain symbols which appear in italic type in the text are in roman type in the tables.

Construction and verification test of flameproof enclosures of electrical apparatus

SECTION ONE - GENERAL

1 Scope

1.1 This standard specifies the constructional features and test requirements for flameproof enclosures of electrical apparatus intended to be used in Class I, Zone 1, explosive gas atmospheres. In addition, flameproof enclosures shall comply with the applicable requirements of ~~IEC 79-0~~ ISA-S12.0.01 (IEC 79-0 Mod).

This standard applies to enclosures and parts of enclosures constructed of metallic and non-metallic materials. ~~Some additional requirements may be necessary for non-metallic materials and these are left to the discretion of the national or other appropriate authority.~~ See [Appendix Annex A](#).

1.2 The ambient temperature range of -20°C to + 60°C for the explosive gas atmosphere characteristics and -20°C to + 40°C for the operation of electrical apparatus as given in ~~IEC 79-0~~ ISA-S12.0.01 (IEC 79-0 Mod) also apply to this standard. In ambient temperatures below -20°C, stronger enclosures may be required due to the higher explosion pressures generated at low temperatures and the possibility of brittle failure of enclosure materials. For ambient temperatures above 60°C, it may be necessary to use smaller joint gaps because the maximum safe gap tends to decrease with an increase in ambient temperature.

1.3 This ~~part of IEC 79-~~ ISA standard deals only with flameproof enclosures and not with other means of protection against an explosion hazard. These are covered by separate standards.

2 Definitions

For the purposes of this standard, the following definitions apply:

2.1 flameproof enclosure: A type of protection of electrical apparatus in which the enclosure will withstand an internal explosion of a flammable mixture which has penetrated into the interior, without suffering damage and without causing ignition, through any joints or structural openings in the enclosure, of an external explosive atmosphere consisting of one or more of the gases or vapors for which it is designed.