1 Scope

This standard ~~part of IEC 61241~~ specifies requirements for the construction and testing of intrinsically safe apparatus intended for use in an explosive dust atmosphere ~~potentially explosive dust cloud or dust layer environments~~ and for associated apparatus that is intended for connection to intrinsically safe circuits which enter such atmospheres ~~environments~~.

This standard supplements the general requirements of ANSI/ISA-61241-0 ~~IEC 61241-0~~: except as indicated in Table A ~~the following list~~. Where a requirement of this standard conflicts with a requirement of ANSI/ISA-61241-0 the requirements of this standard shall take precedence.

NOTE Intrinsically safe and associated intrinsically safe apparatus ~~Apparatus~~ utilized in systems ~~will~~should ~~shall~~ meet the requirements of ~~IEC~~ ANSI/ISA-RP12.06.01 ~~IEC 60079-25~~.

If associated apparatus is protected by a type of protection listed in ANSI/ISA-61241-0 ~~IEC 61241-0~~ or ANSI/ISA-60079-0 ~~IEC 60079-0~~ then the requirements of that method of protection together with the relevant standards, ~~parts of~~ ISA-61241-X ~~IEC 61241-0~~ or ANSI/ISA-60079-X, ~~IEC 60079~~ also apply to the associated apparatus. The list of exclusions in Table A ~~which follows~~ is directly applicable to associated apparatus intended for use in situations where there is no explosive dust ~~potentially hazardous~~ atmosphere and in other circumstances should be used in combination with the requirements of the other methods of protection.

Table A — Exclusion of specific clauses of ANSI/ISA-61241-0 (12.10.02)-2006

Clause or subclause of ~~IEC~~ ANSI/ISA-61241-0		Intrinsically safe apparatus	Associated apparatus
4.1	General	Applies	Applies
~~4.2~~	~~Principles for design and testing of apparatus for use in Zone 20~~	~~Applies~~	~~Excluded~~
4.3	Opening enclosures	Applies	Excluded
4.4	Environmental conditions	Applies	Excluded
5.1	Maximum surface temperature	Applies	Excluded
~~5.2~~	~~Maximum surface temperature with respect to dust layers above 50 mm~~	~~Applies~~	~~Excluded~~
5.3	Ambient temperature	Applies	Applies
6.1	Non-metallic enclosures and non-metallic parts of enclosures	Applies	Excluded
6.1.1	Material specification	Applies	Excluded
6.1.2	Plastic materials	Applies	Excluded
~~6.1.3~~	~~Verification of compliance~~	~~Applies~~	~~Excluded~~
6.1.4	Thermal endurance	Applies	Excluded
6.1.5	Electrostatic charges	Applies	Excluded
6.2	Enclosures containing light metals	Applies	Excluded
6.2.1	Composition	Applies	Excluded
6.2.2	Threaded holes	Excluded	Excluded
7	Fasteners	Excluded	Excluded
8	Interlocking devices	Excluded	Excluded
9	Bushings	Excluded	Excluded

Clause or subclause of ~~IEC~~ ANSI/ISA-61241-0		Intrinsically safe apparatus	Associated apparatus
10	Materials used for cementing	Applies	Excluded
11	Ex components	Applies	Excluded
12	Connection facilities and terminal compartments	Excluded	Excluded
13	Connection facilities for earthing or bonding conductors	Excluded	Excluded
14	~~Cable and conduit entries~~ Entries into Enclosures	Applies	Excluded
15	Radiating equipment	Applies	Excluded
16	Rotating electrical machines	Excluded	Excluded
17	Switchgear	Excluded	Excluded
18	Fuses	Excluded	Excluded
19	Plugs and sockets	Excluded	Excluded
20	Luminaires	Excluded	Excluded
21	Caplights, ~~caplamps~~ and ~~handlamps~~ handlights	Excluded	Excluded
22	Apparatus incorporating cells and batteries	Applies	Excluded
23.1 to 23.3	Verification and tests	Applies	Applies
23.4.1	General	Applies	Excluded
23.4.2.1	Test for resistance to impact	Applies	Excluded
23.4.2.2	Drop test	Applies	Excluded
23.4.2.3	Verification a	Applies	Excluded
23.4.3	Test for dust exclusion (degree of protection)	Applies	Excluded
23.4.4	Torque test for bushings in enclosures ~~for use in Zone 20 or 21~~	Excluded	Excluded
23.4.5.1	Measurement for maximum surface temperature	Applies	Excluded
~~23.4.5.2~~	~~Measurement for surface temperature under excess layer~~	~~Applies~~	~~Excluded~~
~~23.4.5.3~~	~~Temperature control~~	~~Applies~~	~~Excluded~~
23.4.6	Thermal shock tests	Applies	Excluded
23.4.7.1 to 23.4.7.5	Tests of non-metallic enclosures or of non-metallic parts of apparatus ~~for use in Zone 20 or 21~~	Excluded	Excluded
23.4.7.6	Mechanical tests	Applies	Excluded
23.4.7.7	Surface resistivity test	Applies	Excluded
~~27~~	~~Clamping tests of cable entries for non-armoured and braided cables~~	~~Excluded~~	~~Excluded~~
~~28~~	~~Clamping tests of cable entries for armoured cables~~	~~Excluded~~	~~Excluded~~
29	Marking	Applies	Applies
30	Examples of marking	Applies	Applies
a ~~IEC~~ ANSI/ISA-61241-0 pass criteria apply.			

This standard ~~part of IEC 61241~~ is applicable to electrical apparatus in which the electrical circuits themselves are incapable of causing an explosion in the surrounding explosive dust atmosphere. ~~combustible dust environment~~. In other circumstances, associated apparatus should be used in combination with the requirements of the other methods of protection listed in ANSI/ISA-61241-0 ~~IEC 61241-0~~.

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 60079-0:1997, *Electrical apparatus for potentially explosive atmospheres – Part 0: General requirements*~~

ANIS/ISA-60079-0 (12.00.01)-2005, *Electrical Apparatus for Use in Class I, Zones 0, 1 & 2 Hazardous (Classified) Locations: General Requirements*

~~IEC 60079-11, *Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety "I"*~~

ANSI/ISA-60079-11 (12.02.01)-2002, *Electrical Apparatus for Use in Class I, Zones 0, 1 & 2 Hazardous (Classified) Locations - Intrinsic Safety "i"*

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

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

~~IEC 61241-0:2004, *Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements*~~

ANSI/ISA-61241-0 (12.10.02)-2006, *Electrical Apparatus for Use in Zone 20, Zone 21 and Zone 22 Hazardous (Classified) Locations - General Requirements*

~~IEC 61241-1, *Electrical apparatus for use in the presence of combustible dust – Part 1: Protection by enclosures "tD"*~~

ANSI/ISA-61241-1 (12.10.03)-2006, *Electrical Apparatus for Use in Zone 20, Zone 21 and Zone 22 Hazardous (Classified) Locations- Protection by Enclosures "tD"*

3 Terms and definitions

For the purposes of this document, the terms and definitions contained in ANSI/ISA-61241-0 ~~IEC 61241-0~~, ANSI/ISA-60079-0 ~~IEC 60079-0~~ and ANSI/ISA-60079-11 ~~IEC 60079-11~~ apply except that where the term "explosive gas atmosphere" is used it shall be interpreted as meaning "explosive dust atmosphere" ~~"combustible dust environment"~~.

4 Grouping and classification of intrinsically safe apparatus and associated apparatus

Intrinsically safe apparatus and associated apparatus shall be grouped and classified in accordance with ANSI/ISA-61241-0 ~~IEC 61241-0~~.