
Electrical apparatus for potentially explosive atmospheres - Powder filling "q"

Electrical apparatus for potentially explosive atmospheres - Powder filling q

Elektrische Betriebsmittel für explosionsgefährdete Bereiche - Sandkapselung q

Matériel électrique pour atmosphères explosibles - Remplissage pulvérulent q

Ta slovenski standard je istoveten z: EN 50017:1994[SIST EN 50017:1995](https://standards.iteh.ai/catalog/standards/sist/d0c6c5b9-d1b9-4ef1-954a-cfee587c5ea0/sist-en-50017-1995)<https://standards.iteh.ai/catalog/standards/sist/d0c6c5b9-d1b9-4ef1-954a-cfee587c5ea0/sist-en-50017-1995>**ICS:**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50017

April 1994

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Supersedes EN 50017:1977 + A1:1979
To be read in conjunction with EN 50014:1992

Descriptors: Electrical apparatus, potentially explosive atmosphere, explosive atmosphere, explosion proofing, specific requirement, powder filling "q"

English version

Electrical apparatus for potentially explosive atmospheres Powder filling "q"

Matériel électrique pour
atmosphères explosibles
Remplissage pulvérulent "q"

Elektrische Betriebsmittel für
explosionsgefährdete Bereiche
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This European Standard was approved by CENELEC on 6 July 1993. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard has been prepared by Working Group WG 31-04 and by the secretariat of CENELEC Technical Committee TC 31 in accordance with the decisions taken by that committee during its meetings held in Brussels 1991, Stockholm 1992 and Basle 1993.

The text of the draft was submitted to the formal vote in December 1992 and was approved by CENELEC as EN 50017 on 1993-07-06.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-08-01
- latest date of withdrawal of conflicting national standards (dow) -

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Annexes designated normative are part of the body of the standard. In this standard annexe A is normative.

This European Standard is to be read in conjunction with EN 50014:1992 Electrical apparatus for potentially explosive atmospheres - General requirements, and with the second editions of the European Standards for the specific types of protection listed in the Scope of EN 50014:1992. This European Standard should not be considered in conjunction with any of the first edition standards and their amendments, published in 1977 or thereafter, listed in EN 50014.

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General

1 Scope

- 1.1 This European Standard contains the specific requirements for the construction, testing and marking of electrical apparatus, parts of electrical apparatus and Ex components in the type of protection powder filling 'q', intended for use in potentially explosive atmospheres of gas, vapour and mist.

NOTE: Powder-filled electrical apparatus and Ex Components may contain electronic circuits, transformers, protection fuses, relays, intrinsically safe electrical apparatus, associated electrical apparatus, switches etc.

- 1.2 This European Standard supplements EN 50014, the requirements of which apply to powder-filled electrical apparatus.
- 1.3 This European Standard applies only to electrical apparatus, parts of electrical apparatus and Ex components with
- a rated supply voltage less than or equal to 1000 V;
 - a rated current less than or equal to 16 A;
 - a rated power less than or equal to 1000 VA.

2 Normative references

SIST EN 50017:1995

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This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

2.1 EUROPEAN STANDARDS

EN 50014 1992	Electrical apparatus for potentially explosive atmospheres - General requirements
EN 50019 1994	Electrical apparatus for potentially explosive atmospheres - Increased safety 'e'
EN 50020 1994	Electrical apparatus for potentially explosive atmospheres - Intrinsic safety 'i' (Not yet published)
EN 60529 1991	Degrees of protection provided by enclosures (IP Code) (IEC 529:1989)

2.2 IEC Publications with reference to the relevant European Publications

IEC 127	Series	Miniature fuses
IEC 269	Series	Low-voltage fuses
IEC 707	1981	Methods of test for the determination of the flammability of solid electrical insulating materials when exposed to an igniting source

2.3 ISO

ISO 565	1990	Test sieves - Metal wire cloth, perforated metal plate and electro formed sheet - Nominal size of openings
ISO 1210	1982	Plastics - Determination of flammability characteristics of plastics in the form of small specimens in contact with a small flame

3 Definitions

The following definitions specific to type of protection powder filling 'q' are applicable in this European Standard; they supplement the definitions which are given in EN 50014.

3.1 powder filling 'q' SIST EN 50017:1995 <https://standards.iteh.ai/catalog/standards/sist/d0c6c5b9-d1b9-4ef1-954a-cfe587c5a0/sist-en-50017-1995>

A type of protection in which the parts capable of igniting an explosive atmosphere are fixed in position and completely surrounded by filling material to prevent the ignition of an external explosive atmosphere.

NOTE: The type of protection may not prevent the surrounding explosive atmosphere from penetrating into the apparatus and Ex components and being ignited by the circuits. However, due to the small free volumes in the filling material and due to the quenching of a flame which may propagate through the paths in the filling material, an external explosion is prevented.

3.2 filling material

Quartz or glass particles.

3.3 creepage distance

The shortest distance between two conducting parts along the surface of the insulating parts.

3.4 working Voltage

Highest r.m.s. value of the a.c. or d.c. voltage which may occur (locally) across any insulation at rated supply voltage, transients being disregarded, in open circuit conditions or under normal operating conditions.

Constructional requirements

4 Enclosure

4.1 Mechanical strength

The apparatus, part of electrical apparatus and Ex components protected by powder filling 'q' shall comply with the high impact energy requirements of 23.4.3 of EN 50014 and shall meet the pressure test requirements specified in clause 12 and 13 of this standard.

Apparatus or Ex components intended to be mounted inside another enclosure which complies with the requirements for enclosures defined in EN 50014 including the requirements in 23.4.3 are only required to meet the pressure test requirements specified in clause 12 and 13 of this standard. This apparatus shall be marked with the symbol "X" according to 27.2. (9) of EN 50014 if not an Ex component.

4.2 Degree of protection of the enclosure

The enclosure of the powder-filled apparatus, powder-filled part of the apparatus or powder-filled Ex component in its normal service condition, i.e. with all openings closed as in normal use, shall comply at least with the degree of protection IP 54 as defined in EN 60529. If the degree of protection is IP 55 or higher, the enclosure shall be provided with a breathing device. The enclosure with the breathing device in place shall comply with the degree of protection IP 54 according to EN 60529.

Enclosures of powder-filled apparatus or powder-filled parts of apparatus intended for use only in clean, dry rooms, shall comply at least with degree of protection IP 43 as defined in EN 60529. These enclosures shall be marked with the symbol "X".

When the enclosures of powder-filled apparatus, powder-filled parts of apparatus or powder-filled Ex components, are intended to be mounted inside another enclosure complying with EN 50014, this outer enclosure shall have a degree of protection of at least IP 54. The IP code of the inner enclosure does not need to be stated.

The maximum gap of an enclosure shall be at least 0,1 mm smaller than the smallest dimension of the actual filling material not exceeding 0,9 mm, so that no filling material can escape.

4.3 Filling

Filling shall be carried out so as not to leave any voids within the filling material (e.g. by shaking down). The free space within powder-filled electrical apparatus, parts of electrical apparatus or Ex components shall be completely filled with filling material (see also 6.2).

4.4 Means of closing

Enclosures of powder-filled apparatus, powder-filled parts of apparatus or powder-filled Ex components shall be factory-sealed and shall not be capable of being opened without destroying the enclosure or the means of closing. Filling openings shall be closed in the same way.

NOTE: Suitable assembly techniques are e.g. welding, soldering, cemented joints, rivets, cementing of screws.

5 Requirements for filling material

5.1 The documents presented by the manufacturer and verified by the testing station in accordance with 23.2 of EN 50014 shall describe precisely the filling material as well as the filling process and the measures taken to ensure proper filling.

5.1.1 The description shall include:

- name and address of the manufacturer of the filling material;
- exact and complete reference of the filling material;
- size of granules (see 5.1.2);

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5.1.2 Size of granules [cfec587c5ea0/sist-en-50017-1995](https://standards.iteh.ai/catalog/standards/sist/d0c6c5b9-d1b9-4ef1-954a-cfee587c5ea0/sist-en-50017-1995)

The size of granules shall lie within the following sieve limits according to ISO 565:

- upper limit: metal wire cloth or perforated metal plate with nominal size of opening of 1 mm
- lower limit: metal wire cloth with nominal size of opening of 0,5 mm

5.1.3 Only quartz or solid glass particles are allowed.

5.1.4 The testing station is not required to verify compliance of the filling material with 5.1.1, 5.1.2 and 5.1.3.

5.2 The filling material shall be subjected to an electric strength test defined in clause 12 and 13. The leakage current through the filling material shall not exceed 10^{-6} A.

6 Distances

6.1 Except where specified otherwise in this standard the minimum distance through the filling material between electrically conducting parts of the apparatus and insulated components on the one hand, and the inner surface of the enclosure on the other hand shall comply with table 1. This does not apply for conductors used for external connections which penetrate the wall of the enclosure. Such conductors shall comply with 6.3.