

COMMISSION DIRECTIVE 98/65/EC

of 3 September 1998

adapting to technical progress Council Directive 82/130/EEC on the approximation of the laws of the Member States concerning electrical equipment for use in potentially explosive atmospheres in mines susceptible to firedamp

(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

HAS ADOPTED THIS DIRECTIVE:

Having regard to the Treaty establishing the European Community,

Article 1

Directive 82/130/EEC is hereby amended as follows:

Having regard to Council Directive 82/130/EEC of 15 February 1982 on the approximation of the laws of the Member States concerning electrical equipment for use in potentially explosive atmospheres in mines susceptible to firedamp⁽¹⁾, as last amended by Commission Directive 94/44/EC⁽²⁾, and in particular Article 7 thereof,

1. in the first sentence of Annex A, the reference to the 'table below' shall be replaced by the 'tables below';
2. Annex I to the present Directive shall be added to Annex A;
3. Annex II to the present Directive shall be added to Annex B.

Whereas, in view of the present state of technical progress, it is now necessary to adapt the contents of the harmonised standards referred to in Annex A to Directive 82/130/EEC;

Article 2

Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive not later than 31 December 1999 and shall forthwith inform the Commission thereof.

Whereas, in view of the present state of the standardisation of the types of protection involved, it is necessary to provide for the first and second editions of the standards for electrical equipment for use in potentially explosive atmospheres to be used in parallel;

When Member States adopt these provisions, these shall contain a reference to this Directive or shall be accompanied by such reference at the time of their official publication. The procedure for such reference shall be adopted by the Member States.

Whereas certificates issued on the basis of the first edition standards listed in Annex A to Directive 82/130/EEC, as amended, are referred to as 'generation D certificates', and certificates issued on the basis of the second edition standards listed in Annex I to this Directive are referred to as 'generation E certificates'; whereas 'generation D certificates' and 'generation E certificates' are to be used in parallel;

Member States shall communicate to the Commission the texts of the provisions of national law which they have already adopted or adopt in the field governed by this Directive.

Article 3

This Directive is addressed to the Member States.

Whereas Directive 94/9/EC of the European Parliament and the Council of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres⁽³⁾ stipulates that Directive 82/130/EEC be repealed as from 1 July 2003;

It shall enter into force on the 20th day following its publication in the *Official Journal of the European Communities*.

Whereas the measures provided for in this Directive are in accordance with the opinion of the Restricted Committee of the Safety and Health Commission for the Mining and other Extractive Industries,

Done at Brussels, 3 September 1998.

For the Commission

Pádraig FLYNN

Member of the Commission

⁽¹⁾ OJ L 59, 2. 3. 1982, p. 10.

⁽²⁾ OJ L 248, 23. 9. 1994, p. 22.

⁽³⁾ OJ L 100, 19. 4. 1994, p. 1.

ANNEX I

Certificates issued on the basis of the standards listed in the table below shall be referred to as 'generation E certificates'. The letter E shall appear at the beginning of the serial number of each such certificate.

EUROPEAN STANDARDS
(drawn up by Cenelec, 35 rue de Stassart, B-1050 Brussels)

Number	Title	Edition	Date
EN 50014	Electrical apparatus for potentially explosive atmospheres: General requirements	2	December 1992
EN 50015	Electrical apparatus for potentially explosive atmospheres: Oil immersion 'o'	2	April 1994
EN 50016	Electrical apparatus for potentially explosive atmospheres: Pressurised apparatus 'p'	2	October 1995
EN 50017	Electrical apparatus for potentially explosive atmospheres: Powder filling 'q'	2	April 1994
EN 50018	Electrical apparatus for potentially explosive atmospheres: Flameproof enclosure 'd'	2	August 1994
EN 50019	Electrical apparatus for potentially explosive atmospheres: Increased safety 'e'	2	March 1994
EN 50020	Electrical apparatus for potentially explosive atmospheres: Intrinsic safety 'i'	2	August 1994

*ANNEX II***Amendments and supplements made to the European Standards listed in Annex A to this Directive (second editions of European Standards)***Appendix 1***ELECTRICAL APPARATUS FOR POTENTIALLY EXPLOSIVE ATMOSPHERES OF GROUP I****GENERAL REQUIREMENTS**

(European standard EN 50014)

Replace the text of 7.3.1 of European Standard EN 50014 (December 1992) by the following text:

7.3.1. Electrical apparatus of Group I

Enclosures of plastic materials with a surface area projected in any direction of more than 100 cm², or containing exposed metallic parts with a capacitance to earth of more than 3 pF, under the most unfavourable conditions in practice, shall be so designed that under normal conditions of use, maintenance and cleaning, danger of ignition due to electrostatic charges is avoided.

This requirement shall be satisfied:

- either by suitable selection of the material: its insulation resistance, measured according to the method given in 23.4.7.8 of this European standard, shall not exceed:
 - 1 GΩ at 23 ± 2 °C and 50 ± 5 % relative humidity,
 - 100 GΩ under extreme service conditions of temperature and humidity specified for the electrical apparatus; the “X” shall then be placed after the certificate reference, as indicated in, 27.2.9,
- or by the size, shape, layout or by other protective methods. The non appearance of dangerous electrostatic charges shall then be verified by actual tests for ignition of an air methane mixture containing 8,5 ± 0,5 % of methane.

If, however, the danger of ignition cannot be avoided in the design, a warning label shall indicate the safety measures to be applied in service’.

*Appendix 3***ELECTRICAL APPARATUS FOR POTENTIALLY EXPLOSIVE ATMOSPHERES OF GROUP I****INTRINSIC SAFETY 'i'****Intrinsically safe electrical systems**

Note: In mines susceptible to firedamp in the Federal Republic of Germany, the word 'Anlage' is used instead of 'System'.

1. Scope

- 1.1. This Annex contains the specific requirements for construction and testing of intrinsically safe electrical systems all or parts of which are intended for installation in potentially explosive atmospheres of mines susceptible to firedamp, in order to ensure that such electrical systems will not cause an explosion in the surrounding atmosphere.
- 1.2. This Annex supplements European Standard EN 50020 'Intrinsic safety "i"' (second edition, August 1994) the requirements of which apply to the construction and testing of intrinsically safe electrical apparatus and associated electrical apparatus.
- 1.3. This Annex does not take the place of installation rules for intrinsically safe electrical apparatus, associated electrical apparatus and intrinsically safe electrical systems.

2. Definitions

- 2.1. The following definitions, specific to intrinsically safe electrical systems, are applicable in this Annex. They supplement the definitions which are in European Standards EN 50 014 'General requirements' and EN 50020 'Intrinsic safety "i"'.
 - 2.2. Intrinsically safe electrical system

An assembly of items of electrical apparatus defined in a descriptive system document in which the interconnecting circuits, or parts of such circuits, intended for use in a potentially explosive atmosphere, are intrinsically safe circuits, and which meet the requirements of this Annex.

- 2.3. Certified intrinsically safe electrical system

An electrical system conforming to 2.2 for which a testing station has issued a system certificate, certifying that the type of electrical system complies with this Annex.

Note 1: It is not necessary for each electrical apparatus in an intrinsically safe electrical system to be certified individually, but it must suitably be identifiable.

Note 2: In so far as the national regulations for installation make it possible, electrical systems conforming to 2.2, for which the knowledge of the electrical parameters of the items of certified intrinsically safe electrical apparatus, certified associated electrical apparatus, non-certified devices conforming to 1.3 of European Standard EN 50014 'General requirements', and the knowledge of the electrical and physical parameters of the components and interconnecting wiring permits the unambiguous deduction that intrinsic safety is conserved, can be installed without additional certificates.

- 2.4. Accessory

Electrical apparatus which contains only components for connecting and switching intrinsically safe circuits and which do not prejudice the intrinsic safety of the system, such as terminal boxes, junction boxes, plugs and sockets and similar items, switches, etc.

3. *Categories of intrinsically safe electrical systems*
- 3.1. Intrinsically safe electrical systems, or parts thereof, shall be placed in one of the two categories: 'ia' or 'ib'. The requirements of this Annex apply to both categories, unless otherwise specified.
- Note:* Intrinsically safe electrical systems, or parts thereof, may have categories different from those of the intrinsically safe electrical apparatus and associated electrical apparatus included in the system or part thereof. Also different parts of an intrinsically safe electrical system may have different categories.
- 3.2. Category 'ia'
- Intrinsically safe electrical systems, or parts thereof are of category 'ia' if they comply with the requirements for intrinsically safe electrical apparatus of category 'ia' (see 5.2 of European Standard EN 50020 'Intrinsic safety'), except that the intrinsically safe electrical system as a whole shall be considered as a single item of electrical apparatus.
- 3.3. Category 'ib'
- Intrinsically safe electrical systems, or parts thereof, are of category 'ib' if they comply with the requirements for electrical apparatus of category 'ib' (see 5.3 of European Standard EN 50020 'Intrinsic safety') except that the intrinsically safe electrical system as a whole shall be considered as a single item of electrical apparatus.
4. *Interconnecting wiring in an intrinsically safe electrical system*
- 4.1. The electrical parameters and all characteristics of the interconnecting wiring specific to an intrinsically safe electrical system, in so far as intrinsic safety depends on them, shall be specified in the certification documents for that electrical system.
- 4.2. Where a multicore cable contains interconnections which are parts of more than one intrinsically safe circuit the cable shall meet the following requirements:
- 4.2.1. The radial thickness of the insulation shall be appropriate to the diameter of the conductor. In the case of polyethylene, the minimum radial thickness shall be 0,2 mm.
- 4.2.2. Before leaving the manufacturer's works, the multicore cable shall be submitted to AC dielectric tests specified either in 4.2.2.1 or in 4.2.2.2. The success of these tests shall be attested by a tests certificate issued by the cable manufacturer.
- 4.2.2.1. Either each core, before assembly into the cable, is tested at a voltage value (rms) equal to $3\,000\text{ V} + (2\,000 \text{ times the radial thickness of the insulation in mm})\text{ V}$; the assembled cable:
- is firstly tested at a voltage value (rms) equal to 500 V applied between all the armourings or screens of the cable joined together electrically and the bundle of all cores joined together electrically, and
 - is secondly tested at a voltage value (rms) equal to 1 000 V applied between a bundle comprising one half of the cable cores and a bundle comprising the other half of the cores.
- 4.2.2.2. Or the assembled cable:
- is firstly tested at a voltage value (rms) equal to 1 000 V applied between all the armourings or screens of the cable joined together electrically and the bundle of all cores joined together electrically, and
 - is secondly tested at a voltage value (rms) equal to 2 000 V applied in succession between each core of the cable and the bundle formed by all the other cores joined together electrically.
- 4.2.3. The tests prescribed in 4.2.2 shall be carried out with an a.c. voltage of substantially sinusoidal wave form at a frequency between 48 and 62 Hz given by a transformer of appropriate power, taking into account the cable capacity. In the case of dielectric tests on assembled cables, the voltage shall be increased steadily to the specified value in a period not less than 10 seconds and then maintained for at least 60 seconds.
- These tests are carried out by the cable manufacturer.

- 4.3. No fault between the cores of a multicore cable shall be taken into account if one of the two following requirements is satisfied:
- 4.3.1. The cable conforms to 4.2 and each individual intrinsically safe circuit is enclosed in a conducting screen providing at least 60 % coverage.
- Note:* The eventual connection of the screen to earth or frame will be specified in the installation rules.
- 4.3.2. The cable conforms to 4.2, is effectively protected against damage and each intrinsically safe circuit within the cable has, in normal operation, a peak voltage of equal to or less than 60 volts.
- 4.4. Where a multicore cable conforms with 4.2 but not with 4.3 and contains only intrinsically safe circuits forming parts of a single intrinsically safe electrical system, faults shall be considered between up to four cores of the cable in addition to the application of either 3.2 or 3.3.
- 4.5. Where a multicore cable conforms with 4.2 but not with 4.3 and contains intrinsically safe circuits forming parts of different intrinsically safe electrical systems, each intrinsically safe circuit contained in the cable shall have a safety factor of at least four times that required by either 3.2 or 3.3.
- 4.6. Where a multicore cable does not comply with 4.2 and 4.3, any number of faults between the cores of the cable shall be taken into account in addition to the application of 3.2 or 3.3.
- 4.7. The certification documents of the intrinsically safe electrical system shall specify the conditions of use resulting from the application of 4.3 to 4.6.
5. *Accessories used in intrinsically safe electrical systems*
- The accessories which are listed in the certification documents as parts of an intrinsically safe electrical system shall meet:
- points 7 and 8 of European Standard EN 50014 'General requirements',
 - points 6 and 12.2 of European Standard EN 50020 'Intrinsic safety "i"'.
- Their marking shall bear at least the manufacturer's name or its registered trade mark.
- Note:* The use of noncertified accessories is subject to the installation requirements.
6. *Type tests*
- Intrinsically safe electrical systems shall be type tested in accordance with the type test requirements of point 10 of European Standard EN 50020 'Intrinsic safety "i"', but taking into account point 4 of this Annex.
7. *Marking of intrinsically safe electrical systems*
- Certified intrinsically safe electrical systems shall be marked by the holder of the certificate of that system on at least one of the electrical apparatus set on a strategic position. The marking shall include the minimal marking of 27.6 of European Standard EN 50 014 'General requirements' and the letters 'SYST'.
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