



**SLOVENSKI STANDARD
SIST EN 13463-2:2005**

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Non-electrical equipment for use in potentially explosive atmospheres - Part 2: Protection by flow restricting enclosure 'fr'

Nicht-elektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen - Teil 2: Schutz durch schwadenhemmende Kapselung 'fr'

Appareils non électriques destinés à être utilisés en atmosphères explosibles - Partie 2: Protection par enveloppe à circulation limitée 'fr'

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Ta slovenski standard je istoveten z: EN 13463-2:2004

ICS:

13.230	Varstvo pred eksplozijo	Explosion protection
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ICS 13.230

English version

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This European Standard was approved by CEN on 14 October 2004.

CEN 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 CEN 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 CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 13463-2:2004) has been prepared by Technical Committee CEN/TC 305 "Potentially explosive atmospheres - Explosion prevention and protection", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 94/9/EC of 23 March 1994.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard consists of the following parts:

EN 13463-1, *Non-electrical equipment for potentially explosive atmospheres - Part 1: Basic method and requirements.*

EN 13463-2, *Non-electrical equipment for use in potentially explosive atmospheres - Part 2: Protection by flow restricting enclosure "fr".*

prEN 13463-3, *Non-electrical equipment for potentially explosive atmospheres - Part 3: Protection by flameproof enclosure 'd'.*

EN 13463-5, *Non-electrical equipment intended for use in potentially explosive atmospheres - Part 5: Protection by constructional safety "c".*

prEN 13463-6, *Non-electrical equipment for potentially explosive atmospheres - Part 6: Protection by control of ignition source 'b'.*

EN 13463-8, *Non-electrical equipment for potentially explosive atmospheres - Part 8: Protection by liquid immersion 'k'.*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

An explosive atmosphere surrounding an enclosure can penetrate it mainly due to the influence of three mechanisms:

- ventilation;
- equalisation of pressure differences between the inside and outside (breathing);
- diffusion.

If such an enclosure is effectively sealed, but not necessarily gas-tight, it can be assumed that ventilation and diffusion will not cause a significant short-time exchange of atmosphere. Under these conditions, an exchange of the external and internal atmospheres through the seals will only take place if there is a pressure difference across them. Such pressure differences may be caused by changes in temperature and will result in the enclosure "breathing" but will not cause a significant flow of explosive atmosphere into or through the enclosure.

Experience has shown that even simple enclosures can prevent a surrounding explosive atmosphere from reaching ignition sources inside them. Flow restricting enclosures are such simple enclosures, which will prevent, with adequate probability, the atmosphere inside the enclosures becoming explosive if the atmosphere outside the enclosure becomes explosive rarely and for short durations only. For this reason their use is restricted to the fulfilment of category 3 requirements.

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This document is a type B standard as described in EN 1070.

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1 Scope

This document specifies the requirements for the construction and testing of flow restricting enclosures for non-electrical equipment intended for use in potentially explosive atmospheres if the atmosphere outside the enclosure becomes explosive rarely and for short durations only.

This document supplements the requirements in EN 13463-1 the contents of which apply in full to equipment constructed in accordance with this document.

Equipment complying with this standard meets the requirements of Group II – Category 3 equipment. The type of ignition protection described in this standard is unsuitable for use in combination with another type of protection to produce equipment of any other category than category 3.

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.

EN 13463-1:2001, *Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13463-1:2001 and the following apply.

protection by flow restricting enclosure

type of ignition protection which, by means of an enclosure, reduces the probability of ingress of a surrounding explosive atmosphere into the enclosure to an acceptably low level so that the concentration inside the enclosure is below the lower explosive limit

4 General

4.1 General requirements

The requirements of this document apply in addition to the requirements of EN 13463-1.

Flow restricting enclosures used to protect Group II Category 3 equipment may contain ignition sources which occur during normal operation provided the enclosure itself is not an ignition source.

The type of protection shall not be used if the ignition source is an open flame.

4.2 Determination of suitability

The equipment manufacturers ignition hazard assessment required by EN 13463-1 shall have determined that protection by flow restricting enclosure is appropriate to achieve the level of protection required by Group II Category 3 equipment.

NOTE Equipment manufacturer means the manufacturer who applies flow restricting enclosures to protect the equipment that may contain ignitions sources under normal operation. It is not the manufacturer of the empty enclosure.

5 Specific requirements and limitations

5.1 Nature of ignition source

Protection by flow restricting enclosures may be applied in the following circumstance:

- a) Enclosures containing mechanical sparks, and other ignition sources in normal operation but with a limitation in dissipated power such that the averaged air temperature within the enclosure does not exceed the external ambient temperature by more than 10 K. However the internal air temperature may exceed the external ambient temperature by up to 20 K if the rate of temperature decay, when the apparatus is de-energized, is limited to not more than 10 K/h;

The effects of changes in weather conditions e.g. the sun's direct heating on the exterior of the enclosure or rapid cooling by rain showers shall be taken into account. These can cause a larger temperature change than the 10 K allowed.

- b) Where an enclosure is provided with "anti-frost" or "anti-condensation" heating, the 10 K and 20 K temperature rise in a) may apply above the internal non-operating temperature with the heating in operation, provided that the source of energy for the heating is independent of the main source of power for the enclosure. It is essential that simultaneous loss of heating and removal of functional power is unlikely. If the "anti-frost" or "anti-condensation" heating raises the internal temperature more than 10 K (or 20 K with not more than 10 K/h decay) above the external ambient, the instructions supplied with the equipment shall require that the operator of the equipment is satisfied that the equipment is free of hazardous atmosphere before the heating is reapplied following a shut-down.

NOTE The use of flow restricting enclosure to protect against ignition from sparks and other permanent ignition sources is not allowed where, because of high internal temperatures, there is an increased risk of drawing the hazardous atmosphere into the enclosure when the apparatus is de-energised.

Protection by flow restricting enclosure shall not be used in conjunction with any other type of ignition protection listed in EN 13463-1.

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Flow restricting enclosures are not suitable for equipment operated on a short time duty cycle because of the increased probability that the equipment might be de-energised when a flammable gas or vapour surrounds the enclosure.

5.2 Test requirements

Flow restricting enclosures shall comply with Clause 6. Any gasket or special part necessary to comply with the criteria shall be supplied with the enclosure and shall be subjected to the pre-conditioning described in 6.1 before subjected to the test specified in 6.2.

5.3 Enclosures without the provision for carrying out checks after installation

Flow restricting enclosures without the provision for carrying out checks after installation or maintenance shall be type tested including the entries for pipes, shafts etc. These enclosures shall meet the requirements of 6.2.2.

The installation instruction provided with the enclosure shall contain information on proper sealing of the entries.

5.4 Enclosures with provisions for carrying out checks after installation

Provisions shall be made for carrying out checks to ensure that the requirements for flow restricting enclosures are complied with after installation or after maintenance. The enclosures shall meet the requirements of 6.2.1.

The installation instruction provided with the enclosure shall contain information on proper checking of the enclosure after installation and maintenance.

5.5 Resilient gaskets

Resilient gasket seals shall be positioned so that they are not subject to mechanical and/or chemical damage under normal operating conditions and they shall retain their sealing properties over the expected life of the equipment.

Alternatively the manufacturer shall recommend a nominated replacement frequency.

Environmental conditions shall be taken into account.

5.6 Poured seals and encapsulating compounds

Poured seals and encapsulating compounds shall have a continuous operating temperature at least 10 K higher than that occurring when operating in the most onerous rated service conditions.

5.7 Internal fans or similar devices

If internal fans or similar devices are fitted, their operation shall not cause such pressure differences inside the enclosure that the degree of sealing of the enclosure to the environment is decreased.

NOTE If an internal device causes an increased pressure difference between inside and outside of the equipment at a potential source of leakage, an increased flow into the enclosure would result.

5.8 Limits of operation

The manufacturer's instructions shall state that his type of protection shall not be used in situations where there are static pressure differences over the enclosure walls that could cause a constant flow through the enclosure.

6 Verifications and tests

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6.1 Preconditioning for seals and gaskets used to maintain the flow restricting effect

If the equipment contains a gasket or seal of thermoplastic or elastomeric material, the gasket or seal shall be conditioned in an air oven for 7 days at a temperature at least 10 K higher than the temperature of the gasket or seal in the most onerous rated service conditions or (80 ± 2) °C whichever is greater.

Seals and gaskets having the proven property to meet at least the requirements given above need not to be subjected to the preconditioning.

6.2 Tests

6.2.1 Equipment with provisions for checking of flow restricting properties

Under constant temperature conditions, the time interval required for an internal pressure of 300 Pa (3 mbar) below atmospheric pressure to change to 150 Pa (1,5 mbar) below atmospheric pressure shall be not less than 80 s.

6.2.2 Equipment without provisions for checking of flow restricting properties

Under constant temperature conditions the time interval required for an internal pressure of 3 kPa (30 mbar) below atmospheric pressure to change to 1,5 kPa (15 mbar) below atmospheric pressure shall be not less than 180 s.

NOTE For the tests of 6.2.1 and 6.2.2, if the design of the enclosure is such that the rate of breathing is independent of the direction of the pressure the test may alternatively be performed with a positive pressure within the enclosure.