

Transportable gas cylinders — Bursting disc pressure relief devices (excluding acetylene gas cylinders)

The European Standard EN 14513:2005 has the status of a
British Standard

ICS 23.020.30

National foreword

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Transportable gas cylinders - Bursting disc pressure relief devices (excluding acetylene gas cylinders)

Bouteilles à gaz - Bouteilles à gaz transportables -
Dispositifs limiteurs de pression à disque de rupture (à
l'exclusion des bouteilles pour acétylène)

Ortsbewegliche Gasflaschen - Berstscheibeneinrichtungen
zur Druckentlastung (ausgenommen für Acetylenflaschen)

This European Standard was approved by CEN on 14 February 2005.

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Foreword

This document (EN 14513:2005) has been prepared by Technical Committee CEN/TC 23 “Transportable gas cylinders”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by September 2005, and conflicting national standards shall be withdrawn at the latest by September 2005.

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1 Scope

This document specifies the requirements for the design, manufacture and testing for bursting disc pressure relief devices for use with gas cylinders. It is a requirement of this document that the bursting disc pressure relief devices conform to EN ISO 4126-2. In the event of a conflict, the requirements of this document take precedence over that standard.

This document does not apply to acetylene gas cylinders and is restricted to bursting disc pressure relief devices for gas cylinders used in some specific applications.

NOTE This document does not provide methods for determining the capacity of a bursting disc pressure relief device for a particular gas cylinder.

This document will not indicate when a bursting disc pressure relief device shall be fitted and at which pressure it will be set, see EN 13096.

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 ISO 4126-2:2003, *Safety devices for the protection against excessive pressure — Part 2: Bursting disc safety devices (ISO 4126-2:2003)*.

EN ISO 11114-1, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 1: Metallic materials (ISO 11114-1:1997)*.

EN ISO 11114-2, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 2: Non-metallic materials (ISO 11114-2:2000)*.

EN ISO 11114-3, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 3: Autogenous ignition test in oxygen atmosphere (ISO 11114-3:1997)*.

ISO 10156, *Gases and gas mixtures — Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 4126-2:2003 and the following apply.

3.1

pressure

pressure relative to atmospheric pressure, i.e. gauge pressure

3.2

specified minimum temperature

lowest temperature for which the bursting disc pressure relief device is specified

3.3

specified maximum temperature

highest temperature for which the bursting disc pressure relief device is specified

3.4

coincident temperature

temperature of the bursting disc pressure relief device associated with a bursting pressure and which is the expected temperature of the bursting disc when it is required to burst (i.e. the set pressure)

3.5**bursting disc pressure relief device with non replaceable rupture disc**

rupture disc assembly whose rupture disc is permanently joined to the holder by the manufacturer.

The rupture disc is designed to burst at a predetermined pressure to permit the discharge of the gas

3.6**rated burst pressure**

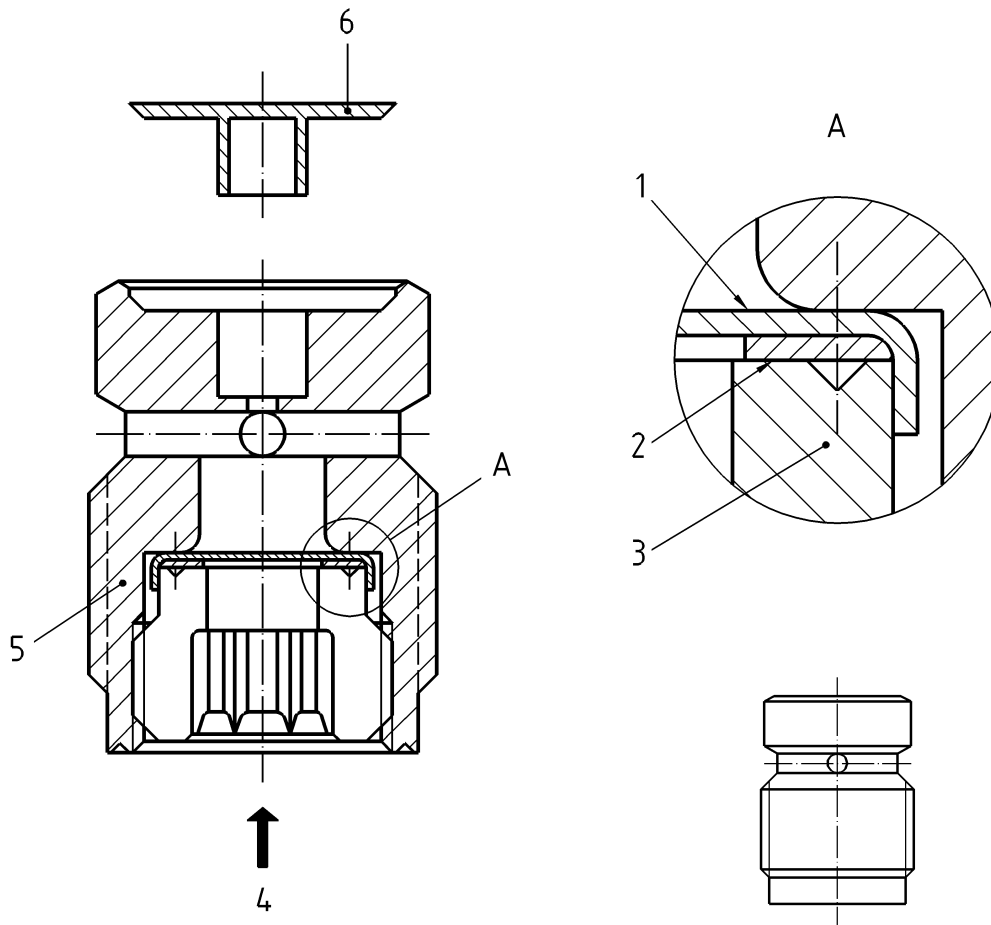
maximum pressure at which the disc is designed to rupture at one specific temperature range

4 Requirements**4.1 General**

The bursting disc pressure relief device shall satisfy all the requirements of EN ISO 4126-2 except where this document takes precedence.

The bursting disc pressure relief device assembly is normally fitted to the cylinder valve (see Figure 1). The assembly and its components shall not be capable of being overstressed in normal operation.

The design of holder assemblies shall ensure that any failure due to overstressing during fitting does not result in ejection of material or contents.



Key

- 1 Burst disc cup
- 2 Sealing ring
- 3 Screw
- 4 Pressure direction
- 5 Burst disc housing
- 6 Indicator plug for burst disc

Figure 1 – Bursting disc

4.2 Design

4.2.1 Design temperature

The specified minimum temperature shall be equal to $-40\text{ }^{\circ}\text{C}$, unless otherwise specified. The specified maximum temperature shall be $+65\text{ }^{\circ}\text{C}$, unless a higher temperature is specified.

4.2.2 Coincident temperature

The coincident temperature used as a reference shall be $+15\text{ }^{\circ}\text{C}$ unless otherwise specified by the purchase order.

4.2.3 Creation of solids on reduction of pressure

Where the bursting disc pressure relief device is specified as suitable for service with products that change from gas, liquid or vapour to solid, e.g. CO₂, the design shall be such as to avoid reduction of the discharge area below that required due to accumulation of the solid product.

4.2.4 Eflux ports from bursting discs

The gas discharge following rupture of a bursting disc should be directed such that the gas cylinder is not made unstable such that it could fall over.

4.3 Materials

4.3.1 Metallic materials

Metallic materials shall be in conformance with EN ISO 11114-1 as appropriate to the gas to be relieved. The strength of the materials shall be adequate for their duty at the maximum specified temperature and the elongation of the materials at the minimum specified material properties.

4.3.2 Non-metallic materials

Non-metallic materials shall be in conformance with reference EN ISO 11114-2 and/or EN ISO 11114-3 as appropriate to the gas to be relieved.

4.3.3 Corrosion resistance

Bursting disc materials shall be resistant to normal atmospheric corrosive agents. Thus particular care shall be taken to ensure that the selected materials of the bursting disc, together with any coating are appropriate such that premature failure or any other malfunction cannot occur.

Some copper alloys are susceptible to stress corrosion cracking, consequently careful consideration shall be given to the assembly before selection of these materials for components under stress and exposed to the corrosive media.

4.3.4 Oxygen compatibility

For oxidizing gases as defined by ISO 10156, the materials shall be oxygen compatible in accordance with EN ISO 11114-1 and EN ISO 11114-3.

5 Bursting disc pressure relief device assembly

It shall be ensured that only a single bursting disc is fitted to each bursting pressure relief device assembly.

6 Production testing

The pressure and burst tests shall be performed in accordance with the requirements of EN ISO 4126-2. Bursting discs with a corrosion resisting coating shall have the integrity of the corrosion resistant coating demonstrated prior to pressure testing. The test medium for hydraulic tests shall be "clean water" or "air" and for pneumatic tests oil free air or an inert gas such as nitrogen.

Before performing the pressure and burst tests, the manufacturer's specifications relating to assembly/torques/procedures shall be followed.

7 Cleanliness

All parts shall be cleaned for the intended service, EN 12300 may be used as a guide.

8 Marking and packaging

The bursting disk or its holder shall have tamper evident seals and shall be marked with:

- the number of this document;
- the burst pressure.

In addition on the packaging, e.g. for the delivery of the disk, shall be :

- manufacturer;
- model;
- size;
- material;
- batch identity.

Bibliography

- [1] EN 12300:1998, *Cryogenic vessels — Cleanliness for cryogenic service.*
- [2] EN 13096, *Transportable gas cylinders — Conditions for filling gases into receptacles — Single component gases.*

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