



SLOVENSKI STANDARD SIST EN ISO 4126-2:2003

01-julij-2003

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Safety devices for protection against excessive pressure - Part 2: Bursting disc safety devices (ISO 4126-2:2003)

Sicherheitseinrichtungen gegen unzulässigen Überdruck - Teil 2:
Berstscheibeneinrichtungen (ISO 4126-2:2003)

Dispositifs de sécurité pour la protection contre les pressions excessives - Partie 2:
Dispositifs de sureté a disque de rupture (ISO 4126-2:2003)

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Ta slovenski standard je istoveten z: EN ISO 4126-2:2003

ICS:

13.240	Varstvo pred previsokim tlakom	Protection against excessive pressure
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SIST EN ISO 4126-2:2003

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 4126-2

January 2003

ICS 13.240

English version

Safety devices for protection against excessive pressure - Part 2: Bursting disc safety devices (ISO 4126-2:2003)

Dispositifs de sécurité pour la protection contre les
pressions excessives - Partie 2: Dispositifs de sûreté à
disque de rupture (ISO 4126-2:2003)

Sicherheitseinrichtungen gegen unzulässigen Überdruck -
Teil 2: Berstscheibeneinrichtungen (ISO 4126-2:2003)

This European Standard was approved by CEN on 9 September 2002.

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 Management Centre 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 Management Centre has the same status as the official versions.

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents

	page
Foreword.....	4
Introduction	5
1 Scope	5
2 Normative references	5
3 Terms and definitions.....	7
4 Materials.....	9
4.1 Selection of materials.....	9
4.2 Material specifications	10
4.3 Protection from corrosion.....	10
5 Types of bursting discs.....	10
5.1 Conventional domed bursting discs (forward acting)	10
5.2 Reverse domed bursting discs (reverse acting).....	11
5.3 Flat bursting discs	11
5.4 Other types and designs.....	13
6 Bursting disc holders.....	13
6.1 Design	13
6.2 Types.....	13
6.3 Connections	15
7 Back pressure supports.....	16
7.1 General.....	16
7.2 Opening back pressure supports.....	16
7.3 Non-opening back pressure supports.....	16
8 Temperature shields.....	16
9 Stiffening rings.....	16
10 Gaskets/seals	16
11 Assembly of bursting disc safety devices	16
11.1 General.....	16
11.2 Bursting disc safety devices with replaceable bursting disc assemblies.....	17
11.3 Bursting disc safety devices with non-replaceable bursting disc assemblies	17
12 Specified bursting pressure requirements	17
13 Inspection by the manufacturer	19
14 Test procedures	19
14.1 General.....	19
14.2 Pressure testing.....	19
14.3 Burst testing	19
14.4 Leak testing	21
14.5 Non-destructive examination.....	21
15 Certification	21
16 Product designation	22
17 Marking	22
17.1 General.....	22
17.2 Bursting discs/bursting disc assemblies.....	23

17.3	Bursting disc holders	23
17.4	Bursting disc safety devices with non-replaceable bursting disc assemblies	24
17.5	Ancillary components	24
17.6	Omission of markings	24
18	Preparation for storage and transportation	25
18.1	General.....	25
18.2	Marking of packages	25
18.3	Provision of assembly and installation instructions	25
18.4	Provision of documents, loose identification plates etc.	25
Annex A (normative) Materials		26
Annex B (informative) Materials.....		28
Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives		33
Bibliography		34

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[SIST EN ISO 4126-2:2003](https://standards.iteh.ai/catalog/standards/sist/4014d56c-520a-4c01-aea1-6d40fad661d/sist-en-iso-4126-2-2003)

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EN ISO 4126-2:2003 (E)**Foreword**

This document (EN ISO 4126-2:2003) has been prepared by Technical Committee CEN/TC 69 "Industrial valves", the secretariat of which is held by AFNOR, in collaboration with ISO/TC 185 "Safety devices for protection against excessive pressure".

This European Standard EN ISO 4126-2:2003 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2003, and conflicting national standards shall be withdrawn at the latest by July 2003.

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(s).

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

This standard for safety devices for protection against excessive pressure consists of seven parts of which this is Part 2. The various parts are:

- *Part 1: Safety valves.*
- *Part 2: Bursting disc safety devices.*
- *Part 3: Safety valves and bursting disc safety devices in combination.*
- *Part 4: Pilot operated safety valves.*
- *Part 5: Controlled safety pressure relief systems (CSPRS).*
- *Part 6: Application, selection and installation of bursting disc safety devices.*
- *Part 7: Common data.*

Part 7 contains data that is common to more than one of the parts of this standard to avoid unnecessary repetition.

Annex A is normative. Annex B is informative.

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

Introduction

A bursting disc safety device is a non-reclosing pressure relief device used to protect pressure equipment such as pressure vessels, piping, gas cylinders or other enclosures from excessive pressure and/or excessive vacuum.

A bursting disc safety device typically comprises an assembly of components including a bursting disc, a bursting disc holder and, where necessary, other components such as back pressure supports, stiffening rings etc.

The bursting disc is a pressure-containing and pressure-sensitive part of the bursting disc safety device and is designed to open by bursting at a pre-determined pressure. There are many different types of bursting disc safety devices manufactured in corrosion resistant materials, both metallic and non-metallic, to cover a wide range of nominal sizes, burst pressures and temperatures.

1 Scope

This part of this European Standard specifies the requirements for bursting disc safety devices.

It includes the requirements for the design, manufacture, inspection, testing, certification, marking, and packaging.

The requirements for the application, selection and installation of bursting disc safety devices are given in Part 6 of this European Standard.

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2 Normative references

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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 (including amendments).

EN 485-1, *Aluminium and aluminium alloys – Sheet, strip and plate – Part 1: Technical conditions for inspection and delivery.*

EN 485-2, *Aluminium and aluminium alloys – Sheet, strip and plate – Part 2: Mechanical Properties.*

EN 485-3, *Aluminium and aluminium alloys – Sheet, strip and plate – Part 3: Tolerances on shape and dimensions for hot-rolled products.*

EN 485-4, *Aluminium and aluminium alloys – Sheet, strip and plate – Part 4: Tolerances on shape and dimensions for cold-rolled products.*

EN 573-3, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 3: Chemical composition.*

EN 573-4, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 4: Forms of products.*

EN 1092-1, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 1: Steel flanges.*

EN 1333, *Pipework components - Definition and selection of PN.*

EN ISO 4126-2:2003 (E)

EN 1652, *Copper and copper alloys – Plate, sheet, strip and circles for general purposes.*

EN 1653, *Copper and copper alloys – Plate, sheet and circles for boilers, pressure vessels and hot water storage units.*

EN 10028-1, *Flat products made of steels for pressure purposes – Part 1: General requirements.*

EN 10028-7, *Flat products made of steels for pressure purposes – Part 7: Stainless steels.*

EN 10088-1, *Stainless steels – Part 1: List of stainless steels.*

EN 10095, *Heat resisting steels and nickel alloys.*

EN 10222-1, *Steel forgings for pressure purposes – Part 1: General requirements for open die forgings.*

EN ISO 6708, *Pipework components - Definition and selection of DN (nominal size) (ISO 6708:1995).*

DIN 17740, *Wrought nickel – Chemical composition.*

DIN 17742, *Wrought nickel alloy with chromium – Chemical composition.*

DIN 17743, *Wrought nickel alloys with copper – Chemical composition.*

DIN 17744, *Wrought nickel alloys with molybdenum and chromium – Chemical composition.*

DIN 17850, *Titanium – Chemical composition.*

SEW 400, *Rolled and forged stainless steels.*

BS 3072, *Specification for nickel and nickel alloys – Sheet and plate.*

BS 3073, *Specification for nickel and nickel alloys – Strip.*

ASTM A240/A240M, *Standard specification for chromium and chromium-nickel stainless steel plate, sheet and strip for pressure vessels and for general applications.*

ASTM B127, *Standard specification for nickel-copper alloy (UNS N04400) plate, sheet, and strip.*

ASTM B162, *Standard specification for nickel plate, sheet and strip.*

ASTM B168, *Standard specification for nickel-chromium-iron alloys (UNS N06600, N06601, N06603, N06690, N06025, and N06045) and nickel-chromium-cobalt-molybdenum alloy (UNS N06617) plate, sheet and strip.*

ASTM B209, *Standard specification for aluminium and aluminium-alloy sheet and plate.*

ASTM B265, *Standard specification for titanium and titanium alloy strip, sheet and plate.*

ASTM B333, *Standard specification for nickel-molybdenum alloy plate, sheet and strip.*

ASTM B424, *Standard specification for Ni-Fe-Cr-Mo-Cu alloy (UNS N08825 and UNS N08221), plate, sheet and strip.*

ASTM B443, *Standard specification for nickel-chromium-molybdenum-columbium alloy (UNS N06625) and nickel-chromium-molybdenum-silicon alloy (UNS N06219), plate, sheet and strip.*

ASTM B569, *Standard specification for brass strip in narrow widths and light gauge for heat-exchanger tubing.*

ASTM B575, *Specification for low-carbon nickel-molybdenum-chromium, low-carbon nickel-chromium-molybdenum, low-carbon nickel-chromium-molybdenum-copper, low-carbon nickel-chromium-molybdenum-tantalum, low-carbon nickel-chromium-molybdenum-tungsten alloy plate, sheet and strip.*

ASTM B708, *Standard specification for tantalum and tantalum alloy, plate, sheet and strip.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

bursting disc safety device

non-reclosing pressure relief device actuated by differential pressure and designed to function by the bursting of the bursting disc(s), and which is the complete assembly of installed components including, where appropriate, the bursting disc holder

3.2

bursting disc assembly

complete assembly of components which are installed in the bursting disc holder to perform the desired function

3.3

bursting disc

pressure-containing and pressure-sensitive component of a bursting disc safety device

3.4

bursting disc holder

part of a bursting disc safety device which retains the bursting disc assembly in position

3.5

conventional domed bursting disc (also referred to as: forward-acting)

bursting disc which is domed in the direction of the bursting pressure (i.e. where the bursting pressure is applied to the concave side of the bursting disc, see Figure 1)

3.6

slotted lined bursting disc

bursting disc made up of two or more layers, at least one of which is slit or slotted to control the bursting pressure of the bursting disc

3.7

reverse domed bursting disc (also referred to as: reverse-acting)

bursting disc which is domed against the direction of the bursting pressure (i.e. where the bursting pressure is applied to the convex side of the bursting disc, see Figure 2)

3.8

flat bursting disc

bursting disc having one or more layers which is flat when installed. It may be made of a ductile or brittle material

3.9

graphite bursting disc

bursting disc manufactured from graphite, impregnated graphite, flexible graphite or graphite composite and designed to burst due to bending or shearing forces

NOTE The following definitions apply:

- a) **graphite.** A crystalline form of the element carbon;
- b) **impregnated graphite.** Graphite in which the open porosity is impregnated with a filler material;
- c) **flexible graphite.** A graphite structure formed by the compression of thermally exfoliated graphite intercalation compounds;

EN ISO 4126-2:2003 (E)

- d) **graphite composite.** Made up of two or more distinct materials and having different properties to those of the separate materials and in which the proportion of graphite is over 50 per cent by weight.

3.10**bursting pressure**

value of the differential pressure between the upstream side and the downstream side of the bursting disc when it bursts

3.11**specified bursting pressure**

bursting pressure quoted with a coincident temperature when defining the bursting disc requirements (used in conjunction with a performance tolerance, see 3.15)

3.12**specified maximum bursting pressure**

maximum bursting pressure quoted with a coincident temperature when defining the bursting disc requirements (used in conjunction with specified minimum bursting pressure, see 3.13)

3.13**specified minimum bursting pressure**

minimum bursting pressure quoted with a coincident temperature when defining the bursting disc requirements (used in conjunction with specified maximum bursting pressure, see 3.12)

3.14**coincident temperature**

temperature of the bursting disc associated with a burst pressure (see 3.11, 3.12 and 3.13) and which is the expected temperature of the bursting disc when it is required to burst

3.15**performance tolerance**

range of pressure between the specified minimum bursting pressure and the specified maximum bursting pressure, or the range of pressure in positive and negative percentages or quantities which is related to the specified bursting pressure (see Figure 9)

3.16**operating pressure**

pressure existing at normal operating conditions within the system being protected

3.17**differential back pressure**

differential pressure across a bursting disc in the opposite direction to the direction of the bursting pressure, which is the result of pressure in the discharge system from other sources and/or a result of vacuum on the upstream side of the bursting disc

3.18**vent area**

cross-section area available for discharge of fluid

3.19**batch**

quantity of bursting discs or bursting disc safety devices made as a single group of the same type, size, materials and specified bursting pressure requirements where the bursting discs are manufactured from the same lot of material (see 3.20)

3.20**lot of material**

- a) **metal.** Material of the same specification coming from the same heat number, heat treatment batch and specified thickness with tolerances to an appropriate standard;

- b) **graphite and flexible graphite.** Material of the same specification grade and quality coming from the same graphite manufacturer and the same manufacturing process;
- c) **impregnated graphite.** Graphite of the same lot impregnated with a specific grade of filler material by the same manufacturing process;
- d) **graphite composite.** Graphite and specific grades of other constituents coming from the same mix

3.21**back pressure support**

component of a bursting disc safety device which prevents damage to the bursting disc due to differential back pressure

NOTE A back pressure support which is intended to prevent damage to the bursting disc when the system pressure falls below atmospheric pressure is sometimes referred to as a vacuum support.

3.22**stiffening ring**

component of a bursting disc assembly used primarily for reinforcing fragile bursting discs, so as to prevent damage

3.23**coating**

layer of metallic or non-metallic material applied to components of a bursting disc safety device by a coating process

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3.24**lining**

additional sheet or sheets of metallic or non-metallic material forming part of a bursting disc assembly or bursting disc holder

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3.25**plating**

metal layer applied to a bursting disc or bursting disc holder by a plating process

3.26**muffled outlet**

component of a bursting disc safety device which disperses the discharge

3.27**temperature shield**

device which protects a bursting disc from excessive temperature

4 Materials**4.1 Selection of materials**

The selection of materials used for the components of bursting disc safety devices shall take into account:

- a) suitability with regard to manufacture;
- b) compatibility with the process fluid, the adjoining components and the chemical and physical conditions to which the bursting disc safety device will be subjected when in service.

NOTE The use of corrosion-resistant materials for the downstream side of the bursting disc device is recommended because corrosion of these parts can cause damage which can impair the performance of the bursting disc safety device.

EN ISO 4126-2:2003 (E)

4.2 Material specifications

The material specification for the bursting disc safety devices shall be according to annex A (normative) and annex B (informative).

They shall have uniform chemical and physical properties and shall be free from defects, which would cause the bursting disc safety device to malfunction.

4.3 Protection from corrosion

Bursting disc safety devices are frequently required to operate in corrosive environments and, therefore, components manufactured from materials affected by corrosion shall, where appropriate, be protected by coating, plating or lining.

Coatings and plating shall be applied to give an even and homogeneous coating to the surfaces to be protected.

Linings shall be seamless and supplied with the bursting disc safety device so as to preserve them as a set or integral unit.

The corrosion protection shall be supplied only by the manufacturer.

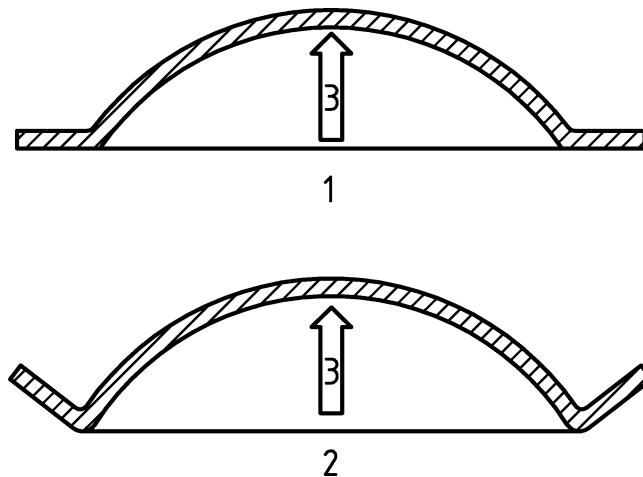
The corrosion protection shall not impair the performance of the bursting disc safety device.

5 Types of bursting discs

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5.1 Conventional domed bursting discs (forward acting)

Conventional domed bursting discs shall be designed so that they burst due to tensile stresses when the bursting pressure is applied to the concave side of the bursting disc (see Figure 1).



Key

- 1 Flat seat
- 2 Angle seat
- 3 Flow

Figure 1 — Conventional domed bursting disc (forward acting)

They shall be domed by a means sufficient to cause a permanent set such that no further plastic flow will occur initially when the bursting disc is subjected to its intended operating condition.

Conventional domed bursting discs include the following types: