



**SLOVENSKI STANDARD**  
**oSIST prEN 12416-1:2023**  
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**Vgrajeni gasilni sistemi - Sistemi s praškom - 1. del: Zahteve in preskusne metode za sestavne dele**

Fixed firefighting systems - Powder systems - Part 1: Requirements and test methods for components

Ortsfeste Brandbekämpfungsanlagen - Pulverlöschanlagen - Teil 1: Anforderungen und Prüfverfahren für Bauteile

Installations fixes de lutte contre l'incendie - Systèmes d'extinction à poudre - Partie 1: Exigences et méthodes d'essais des éléments constitutifs

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## Fixed firefighting systems - Powder systems - Part 1: Requirements and test methods for components

Installations fixes de lutte contre l'incendie - Systèmes  
d'extinction à poudre - Partie 1: Exigences et méthodes  
d'essais des éléments constitutifs

Ortsfeste Brandbekämpfungsanlagen -  
Pulverlöschanlagen - Teil 1: Anforderungen und  
Prüfverfahren für Bauteile

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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**prEN 12416-1:2023 (E)****European foreword**

This document (prEN 12416-1:2023) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12416-1:2001+A2:2007.

This European Standard has the general title “Fixed firefighting systems - Powder systems” and consists of the following two parts:

- Part 1: Requirements and test methods for components
- Part 2: Design, construction and maintenance

This document is included in a series of European Standards planned to cover also:

a) gas extinguishing systems (EN 12094);

b) sprinkler systems (EN 12259 and EN 12845);

c) smoke control systems (EN 12101);

d) explosion protection systems (EN 26184);

e) foam systems (EN 13565);

f) hose systems (EN 671);

g) water spray systems (EN 14816).

<https://standards.iteh.ai/catalog/standards/sist/275c1c9e-5cf7-4b59-a79b-722d2c03001c/osist-pren-12416-1-2023>

## Introduction

It has been assumed in the preparation of this document that the execution of its provisions is entrusted to appropriately qualified and experienced people.

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[oSIST prEN 12416-1:2023](https://standards.iteh.ai/catalog/standards/sist/275c1c9e-5cf7-4b59-a79b-722d2c03001c/osist-pren-12416-1-2023)

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**prEN 12416-1:2023 (E)****1 Scope**

This document specifies requirements and test methods for materials, construction and performance of components intended for use in powder firefighting systems complying with EN 12416-2:2001+A1:2007.

The components covered are as follows:

- powder containers
- expellant gas container assemblies
- pressure regulators and gauges
- actuators
- main isolating valves and selector valves
- nozzles.

The components are suitable for powder firefighting systems for general use in buildings and other construction works. In areas with a risk of explosion, earthquake zones, extreme environmental conditions e.g. marine, offshore, mining or aircraft additional considerations apply.

This document covers components for use in powder extinguishing systems complying with EN 12416-2:2001+A1:2007. It does not cover, for example, pipes and fittings which are covered by more general standards for which requirements and recommendations are given in EN 12416-2:2001+A1:2007. Nor does it cover fire detectors or electrical control and indicating equipment.

**2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 286-1:1998, *Simple unfired pressure vessels designed to contain air or nitrogen - Part 1: Pressure vessels for general purposes*

EN 1964-3, *Transportable gas cylinders - Specification for the design and construction of refillable transportable seamless steel gas cylinders of water capacities from 0,5 litre up to and including 150 litres - Part 3: Cylinders made of seamless stainless steel with an Rm value of less than 1100 MPa*

EN 12094-4, *Fixed firefighting systems - Components for gas extinguishing systems - Part 4: Requirements and test methods for container valve assemblies and their actuators*

EN 12094-5, *Fixed firefighting systems - Components for gas extinguishing systems - Part 5: Requirements and test methods for high and low pressure selector valves and their actuators*

EN 12094-8, *Fixed firefighting systems - Components for gas extinguishing systems - Part 8: Requirements and test methods for connectors*

EN 12094-13, *Fixed firefighting systems - Components for gas extinguishing systems - Part 13: Requirements and test methods for check valves and non-return valves*

EN 12416-2:2001+A1:2007, *Fixed firefighting systems - Powder systems - Part 2: Design, construction and maintenance*

EN 60529, *Degrees of protection provided by enclosures (IP Code)*



EN ISO 4126-1, *Safety devices for protection against excessive pressure - Part 1: Safety valves (ISO 4126-1)*

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

EN ISO 9809-1, *Gas cylinders - Design, construction and testing of refillable seamless steel gas cylinders and tubes - Part 1: Quenched and tempered steel cylinders and tubes with tensile strength less than 1 100 MPa (ISO 9809-1)*

EN ISO 9809-2, *Gas cylinders - Design, construction and testing of refillable seamless steel gas cylinders and tubes - Part 2: Quenched and tempered steel cylinders and tubes with tensile strength greater than or equal to 1 100 MPa (ISO 9809-2)*

EN ISO 10297, *Gas cylinders - Cylinder valves - Specification and type testing (ISO 10297)*

EN ISO 17871, *Gas cylinders - Quick-release cylinder valves - Specification and type testing (ISO 17871)*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

### 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.1

##### **actuator**

component which when receiving a signal operates another component

#### 3.2

##### **bursting disc**

diaphragm designed to burst at a predetermined pressure difference

#### 3.3

##### **calculation zone**

zone for which the design quantity of the extinguishing media required is calculated separately

#### 3.4

##### **diptube (of the powder container)**

tube through which powder from the lower part of the container is transported into the piping

#### 3.5

##### **equipment fire**

fire of three dimensional objects, also subject to leakage, dripping or splashing

#### 3.6

##### **expellant gas container**

high pressure container to store the expellant gas

**prEN 12416-1:2023 (E)****3.7****expellant gas container valve**

valve which retains the expellant gas in the expellant gas container, and which releases it when actuated

**3.8****fill ratio (of the expellant gas container)**

mass of an expellant gas relative to the net capacity of the expellant gas container, expressed in kilograms per litre (kg/l)

**3.9****flooding zone**

zone comprising all calculation zones to be flooded simultaneously with the extinguishing media via one selector valve

**3.10****local application system**

system to protect separate objects

**3.11****maximum working pressure**

pressure (at a temperature of 50 °C) at which the system or the component can still work and may be operated

**3.12****minimum release energy**

energy which is needed for the operation of a component

**3.13****minimum working pressure**

pressure (at a temperature of - 20 °C) at which the system or the component can still be operated

**3.14****non-return valve**

component permitting flow only in one direction

**3.15****nozzle**

component to achieve determined performance characteristics and a uniform distribution into or at a protected zone

**3.16****pilot container**

power source for a pneumatic alarm device and for actuation of the expellant gas container

**3.17****(extinguishing) powder**

extinguishing medium composed of finely divided solid chemical products consisting of one or more principle components, which are combined with additives to improve its characteristics

[SOURCE: EN 615]

Note 1 to entry: In North America and some other countries, the term “dry powder” is used to denote special metal fire extinguishing agents and the term “dry chemical extinguishing agent” is used to denote the extinguishing medium specified in this European Standard.

Note 2 to entry: When it is useful to indicate the class of fire for which a powder is designed, capital letters may be added before the term. The letters used in this European Standard are those defined in EN 2.

EXAMPLE BC powder is designed to extinguish class B (liquids or liquefied solids) and class C (gases) fires; ABC powder is designed to extinguish class A (solids which form glowing members), class B and class C fires.

**3.18****protected zone**

entire number of flooding zones protected by one system

**3.19****selector valve**

component which opens or prevents the flow of extinguishing media into a flooding zone

**3.20****surface fire**

fire spreading across horizontal surfaces. A surface fire may be a fire involving flammable liquids, gases or solids, not subjected to smouldering

**3.21****total flooding system**

system to protect the entire contents of an enclosed space

**3.22****working pressure**

pressure at which the component is used in the system

**3.23****working temperature range**

temperature range at which the system or the component can still work and may be operated

**4 General requirements for components****4.1 Working temperature range**

The components shall have a working temperature range of - 20 °C to + 50 °C.

If CO<sub>2</sub> pilot containers or CO<sub>2</sub> expellant gas containers are used the working temperature range shall be 0 °C to 40 °C.

**4.2 General test facilities**

It shall be ensured that the function of all actuators can be tested without discharging the expellant gas. Depending on the type of the system test connectors for an external test cylinder shall be available.

**4.3 Stress corrosion test**

If copper alloy parts are used they shall be subjected to the stress corrosion test in Annex K.

**prEN 12416-1:2023 (E)****5 Powder container****5.1 Capacity**

The volume shall be not more than 4000 l.

**5.2 Design**

The powder container shall be designed in accordance with EN 286-1 and shall be made of steel.

**5.3 Maximum working pressure**

The maximum working pressure shall not exceed 25 bar.

**5.4 Colour**

The powder containers shall be coloured red in accordance with ISO 3864-1.

**5.5 Container components****5.5.1 Powder filling opening**

The powder filling opening of the container shall be not less than DN 100.

Sight-holes, handholes, headholes and manholes may be used for filling in accordance with EN 286-1, if they are located on the top of the powder container.

**5.5.2 Drain connection**

For inspection of the interior of the container and testing of the powder, a drain connection to empty the powder container should be provided.

Drain connections, if provided, shall be not less than:

— for  $V$  up to 1000 l:  $R 1/2$  or  $R_p 1/2$  or  $G 1/2$ ;

— for  $V$  above 1000 l:  $R 1$  or  $R_p 1$  or  $G 1$ .

**5.5.3 Pressure relief device**

The powder container shall be fitted with a pressure relief device. The set pressure of the pressure relief device is never greater than the maximum working pressure, but after pressure relief has commenced the pressure can exceed the maximum working pressure by 10 % maximum. The gas flow rate through the pressure relief device shall be greater than the maximum rate of expellant gas entering into the powder container.

**5.5.4 Connection for the expellant gas tube**

The expellant gas tube shall be fitted to the powder container discharging the gas below the powder surface. The system shall be designed to prevent powder entering the expellant gas system.

**5.5.5 Powder diptube**

The powder container shall be fitted with a powder diptube.

The diptube shall be fixed with sufficient strength to resist damage during operation (filling, emptying of the container or during the discharge of powder).

The length and configuration of the diptube shall be such that the volume of powder remaining in the container at the end of the discharge is less than 5 % of the internal volume of the container.

The function of the container including the diptube shall be demonstrated by test as described in Annex D.

The powder filling opening of the container shall be not less than DN 100.