



**SLOVENSKI STANDARD**  
**SIST EN 1028-2:2003+A1:2008**  
**01-september-2008**

---

**Gasilske črpalke - Gasilske centrifugalne črpalke s sesalno napravo - 2. del:  
Preverjanje splošnih in varnostnih zahtev**

Fire-fighting pumps - Fire-fighting centrifugal pumps with primer - Part 2: Verification of general and safety requirements

Feuerlöschpumpen - Feuerlöschkreiselpumpen mit Entlüftungseinrichtung - Teil 2: Feststellung der Übereinstimmung mit den allgemeinen und Sicherheitsanforderungen

Pompes à usage incendie - Pompes centrifuges avec dispositif d'amorçage destinées à la lutte contre les incendies - Partie 2: Vérification des prescriptions générales et de sécurité

<https://standards.iteh.ai/catalog/standards/sist/c55c139a-67f8-4987-8d4f-4caba6eabc7c/sist-en-1028-2-2003a1-2008>

**Ta slovenski standard je istoveten z: EN 1028-2:2002+A1:2008**

---

**ICS:**

13.220.10      Gašenje požara      Fire-fighting

**SIST EN 1028-2:2003+A1:2008**      en,fr,de

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 1028-2:2003+A1:2008](https://standards.iteh.ai/catalog/standards/sist/c55c139a-67f8-4987-8d4f-4caba6eabc7c/sist-en-1028-2-2003a1-2008)

<https://standards.iteh.ai/catalog/standards/sist/c55c139a-67f8-4987-8d4f-4caba6eabc7c/sist-en-1028-2-2003a1-2008>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 1028-2:2002+A1**

April 2008

ICS 13.220.10

Supersedes EN 1028-2:2002

English Version

## Fire-fighting pumps - Fire-fighting centrifugal pumps with primer - Part 2: Verification of general and safety requirements

Pompes à usage incendie - Pompes centrifuges avec dispositif d'amorçage destinées à la lutte contre les incendies - Partie 2: Vérification des prescriptions générales et de sécurité

Feuerlöschpumpen - Feuerlöschkreiselpumpen mit Entlüftungseinrichtung - Teil 2: Feststellung der Übereinstimmung mit den allgemeinen und Sicherheitsanforderungen

This European Standard was approved by CEN on 5 April 2002 and includes Amendment 1 approved by CEN on 21 February 2008.

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

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

<https://standards.iteh.ai/catalog/standards/sist/c55c139a-67f8-4987-8d4f-4caba6eabc7c/sist-en-1028-2-2003a1-2008>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

## EN 1028-2:2002+A1:2008 (E)

## Contents

	page
Foreword .....	3
0 Introduction .....	4
1 Scope .....	4
2 Normative references .....	4
3 Terms and definitions .....	5
4 Verifications .....	5
4.1 General .....	5
4.2 Type verification .....	5
4.3 Individual verification .....	5
4.4 Methods of verification .....	6
4.4.1 Calculation check .....	6
4.4.2 Design check .....	6
4.4.3 Compliance verification (manufacturing check) .....	6
4.5 Measuring instruments .....	7
5 Verification of the safety requirements and/or protective measures .....	8
6 Verification of the general and performance requirements .....	11
7 Test report .....	14
Annex A (normative) <b>Suction line for tests</b> .....	15
Annex B (normative) <b>Pressure measurements</b> .....	18
Annex C (normative) <b>Measurements of delivery rates</b> .....	19
Annex D (normative) <b>Dry suction test</b> .....	20
Annex E (normative) <b>Performance test</b> .....	22
Annex F (normative) <b>Working test</b> .....	24
Annex G (normative) <b>Pressure test</b> .....	25
Annex H (normative) <b>Efficiency test</b> .....	26
Annex I (normative) <b>Primer test</b> .....	28
Annex J (normative) <b>Cold test</b> .....	29
Annex K (informative) <b>Guidance for acceptance tests on delivery</b> .....	30
Annex ZA (informative) <b>Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC</b> .....	31
Annex ZB (informative) <b>Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC</b> .....	32
Bibliography .....	33

## Foreword

This document (EN 1028-2:2002+A1:2008) has been prepared by Technical Committee CEN/TC 192 "Fire service equipment", 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 October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

This document supersedes EN 1028-2:2002.

This document includes Amendment 1, approved by CEN on 2008-02-21.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A_1}$   $\langle A_1 \rangle$ .

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).

$\boxed{A_1}$  For relationship with EU Directives, see informative Annexes ZA and ZB, which are integral parts of this document.  $\langle A_1 \rangle$

This part of this European Standard shall be applied only in conjunction with  $\boxed{A_1}$  EN 1028-1:2002+A1  $\langle A_1 \rangle$  "Classification - General and safety requirements".

This part of this European Standard includes the verification of general and safety requirements of fire-fighting centrifugal pumps with primer.

EN 1028 "Fire-fighting pumps – Fire-fighting centrifugal pumps with primer" comprises two parts:

— Part 1: Classification - General and safety requirements;

— Part 2: Verification of general and safety requirements.

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

**EN 1028-2:2002+A1:2008 (E)**

## 0 Introduction

This European Standard is a type C standard as stated in EN 1070.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this standard.

Where provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built in accordance with the provisions of this type C standard.

This Standard has been prepared as a harmonized standard to provide one means of conformity with essential requirements of the Machinery Directive and associated EFTA Regulations.

## 1 Scope

This European Standard covers verification of the general and safety requirements of fire-fighting centrifugal pumps with primer as specified in clauses 7 and 8 of **EN 1028-1:2002+A1:2008**.

NOTE The tests can also be applied to pumps with nominal delivery rates greater than 6 000 l/min.

This standard does not apply to verification related to installation.

This standard does not apply to fire-fighting centrifugal pumps with primer that are manufactured before the date of publication by CEN of this standard.

## 2 Normative references

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 837-3, *Pressure gauges — Part 3: Diaphragm and capsule pressure gauges — Dimensions, metrology, requirements and testing.*

**EN 1028-1:2002+A1:2008**, *Fire-fighting pumps — Fire-fighting centrifugal pumps with primer — Part 1: Classification — General and safety requirements.*

EN 1070, *Safety of machinery — Terminology.*

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

EN ISO 1127, *Stainless steel tubes — Dimensions, tolerances and conventional masses per unit length.*

### 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1070 and  $\text{A1}$  EN 1028-1:2002+A1  $\text{A1}$  apply.

### 4 Verifications

#### 4.1 General

Safety and performance requirements of clauses 5 and 6 of  $\text{A1}$  EN 1028-1:2002+A1:2008  $\text{A1}$  shall be verified according to Tables 2 and 3.

All hydraulic tests shall be carried out using water having a temperature between 0 °C and 20 °C. During one test cycle, the water temperature shall not deviate by more than  $\pm 3$  °C within this temperature range. The geodetic suction height shall not deviate by more than  $\pm 5$  cm during one test cycle. In order to avoid air entrainment, the test configuration shall be as shown in Figure A.1 in annex A.

If the safety equipment has to be disconnected to carry out any test, the manufacturer shall give information regarding the disconnected safety equipment (e.g. compensating or alternative safety measures to be used during the test and re-connection instructions after completing the test).

Verification shall be carried out with the pump equipment assembled for normal intended use.

Accessories and covers may be fitted or not, but the effect in either case shall not obscure the validity of the test.

Where the pump is assembled on site, the part of the verifications that cannot be made before dispatch shall be carried out at the place of use in accordance with the installation instructions of the pump manufacturer.

<https://standards.iteh.ai/catalog/standards/sist/c55c139a-67f8-4987-8d4f-1028-2:2003+A1:2008>

For testing purposes, the fire-fighting centrifugal pump shall be presented in its full operational configuration. The pump shall be equipped to undergo the full range of tests required. For pumps without a driving motor, a drive flange shall be provided for testing.

NOTE 1 If dimensions, mass, or other factors make particular tests on complete equipment impractical, tests can be carried out on subassemblies or components provided that the results can be verified as representative of the fully assembled equipment.

NOTE 2 A guidance for acceptance tests on delivery is given in the informative annex K.

The verification regime covers the following basic verifications which applies in clauses 5 and 6.

#### 4.2 Type verification

Ensure that each type of the pump meets the requirements of this standard.

NOTE This verification is indicated as "TYP" in Tables 2 and 3.

#### 4.3 Individual verification

Ensure that each pump put on the market meets the requirements of this standard before dispatch.

NOTE This verification is indicated as "IND" in Tables 2 and 3.

**EN 1028-2:2002+A1:2008 (E)****4.4 Methods of verification**

The methods of type and/or individual verifications are described as follow.

**4.4.1 Calculation check**

Determine that the calculations are correct according to the standard requirements. Calculations used to establish compliance with a requirement shall be recorded by the manufacturer and retained for future examination.

NOTE The calculation check can be replaced by a stress measurement test if the results are equivalent.

**4.4.2 Design check**

Determine that the design requirements of the standard have been achieved (design documentation).

**4.4.3 Compliance verification (manufacturing check)**

Determine that the pump is built according to the design and that the materials and their assemblies comply with the design documents and are sound, including the following.

**4.4.3.1 Verification of documents**

Determine that all necessary documents are present (e.g. attestations of conformity of supplied parts by the supplier).

**4.4.3.2 Visual check**

Determine by simple visual inspection that something is present (e.g. guard, marking, document), that the marking contains the required information/warnings, that there is no evident external leakage etc.



**4.4.3.3 Verification by measurement (see also annexes C, D, E, H, I and J.4)**

Determine by measurement, with suitable measuring instruments, that the requirements of the measurable parameters of the standard have been met (e.g. geometric dimensions, delivery rate, pressure, temperatures) (see also 4.5).

Methods of measurement should be selected to make use of existing or standardised methods.

**4.4.3.4 Static test (see also annex G)**

Test out of the range of functional tests.

Conduct the static pressure test and establish that the pump complies with the requirements of the standard.

**4.4.3.5 Dynamic test (see also annex G)**

Test out of the range of functional tests.

Conduct the dynamic test and establish that the pump complies with the requirements of the standard. Check that all safety devices are installed correctly and that their operation is as intended.

**4.4.3.6 Functional tests (see also annexes D, E, F, G, I, J)**

Determine by functional tests that the pump operates to the requirements of the standard including all safety devices, except those related to pressure overload protection.

**4.4.3.7 Test of pressure overload protection devices (see also annexes E, G)**

Determine that any pressure overload protection device operates to the requirements of the standard.

**4.4.3.8 Verification of the information for the user**

Verify that all necessary information for safe commissioning, use, maintenance/inspection, decommissioning etc. as stated in the standard are present and adequate.

**4.4.3.9 Verification of the information for the installer**

Verify that all necessary information on installation are present and adequate.

**4.5 Measuring instruments**

Measuring instruments for the measurements specified in annexes B, C, D, E, F, G, H, I and J shall have an accuracy conforming to Table 1.

## EN 1028-2:2002+A1:2008 (E)

Table 1 — Accuracy of measuring instruments

Measuring instrument for	Accuracy
Delivery rate	$\pm 1,5$ % of $Q_N$
Speed	$\pm 0,5$ % of $n_N$
Pressure	$\pm 1,0$ % of $p_N$
Torque	$\pm 1,0$ % at $n_N$
Vacuum	$\pm 0,04$ bar
Temperature	$\pm 1,0$ °C

## 5 Verification of the safety requirements and/or protective measures

Safety requirements and/or protective measures of  $\text{A1}$  EN 1028-1:2002+A1  $\text{A1}$  shall be verified in accordance with the method(s) specified in Table 2. Every indicated verification method shall be carried out.

The test arrangements in annexes A to J, except annex I, shall be applied.

iTech STANDARD PREVIEW  
(standards.iteh.ai)

[SIST EN 1028-2:2003+A1:2008](https://standards.iteh.ai/catalog/standards/sist/c55c139a-67f8-4987-8d4f-4caba6eabc7c/sist-en-1028-2-2003a1-2008)

<https://standards.iteh.ai/catalog/standards/sist/c55c139a-67f8-4987-8d4f-4caba6eabc7c/sist-en-1028-2-2003a1-2008>

Table 2 — Appropriate method(s) of verification of the safety requirements and/or protective measures of **EN 1028-1:2002+A1**

<b>EN 1028-1:2002+A1:2008</b>	Calculation check	Design check	Verification of documents	Visual check	Verification by measurement	Static test	Dynamic test	Functional tests	Test of pressure overloading protection devices	Verification of the information for the user	Verification of the information for the installer
5.1	-	TYP	TYP	-	-	-	-	-	-	TYP	TYP
5.2.1.1.1											
1st paragraph	-	TYP	-	TYP and IND	TYP	-	-	-	-	TYP	TYP
2nd paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	-	TYP
3rd paragraph	-	TYP	-	TYP	-	-	-	-	-	TYP	TYP
4th paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	TYP	TYP
5th paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	-	TYP
6th paragraph	-	-	TYP	TYP	-	-	-	-	-	-	TYP
5.2.1.1.2											
1st paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	TYP	TYP
2nd paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	TYP	TYP
3rd paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	TYP	TYP
4th paragraph	-	-	-	TYP and IND	-	-	-	-	-	-	TYP
5th paragraph	-	TYP	-	TYP and IND	TYP	-	-	-	-	-	TYP
5.2.1.1.3	-	TYP	-	TYP and IND	TYP	-	-	-	-	-	TYP
5.2.1.2.1											
1st paragraph	-	TYP	TYP	-	-	-	-	TYP	-	-	-
2nd paragraph	-	-	TYP	-	-	-	-	-	-	TYP	-
5.2.1.2.2											
1st paragraph	TYP	TYP	TYP	-	-	TYP	TYP	TYP and IND	-	-	-
2nd paragraph	-	TYP	-	-	-	-	-	-	-	-	-
3rd paragraph	-	TYP	-	-	-	-	-	-	TYP and IND	-	-
4th paragraph	-	-	-	-	-	-	-	-	-	-	TYP

https://standards.iteh.ai/catalog/standards/sist/4caba6eabc7c/sist-1028-2-2003a1-2008  
 Standards.iteh.ai  
 iTeh STANDARD PREVIEW  
 (standards.iteh.ai)

Table 2 — Appropriate method(s) of verification of the safety requirements and/or protective measures of **EN 1028-1:2002+A1** (concluded)

EN 1028-1:2002+A1:2008 Reference to relevant safety requirement clause	Calculation check	Design check	Verification of documents	Visual check	Verification by measurement	Static test	Dynamic test	Functional tests	Test of pressure overloading protection devices	Verification of the information for the user	Verification of the information for the installer
5.2.1.2.3	-	-	-	-	-	-	-	TYP and IND	-	-	-
5.2.1.2.4	-	-	-	-	-	TYP and IND	-	-	-	-	-
5.2.1.2.5	-	-	-	-	-	-	TYP and IND	-	-	-	-
5.2.1.2.6	-	TYP	-	-	-	-	-	-	-	-	-
5.2.1.2.7	-	TYP	-	-	-	-	-	-	-	-	TYP
5.2.2	-	-	TYP	-	-	-	-	-	-	-	TYP
5.2.3	-	TYP	-	TYP and IND	TYP	-	-	-	-	TYP	TYP
5.2.4											
1st paragraph	-	-	TYP	TYP	-	-	-	-	-	-	-
2nd paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	-	-
3rd paragraph	-	TYP	-	-	-	-	-	-	-	-	TYP
4th paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	-	TYP
5th paragraph	-	-	-	TYP and IND	-	-	-	-	-	-	TYP
6th paragraph	-	TYP	-	TYP	-	-	-	-	-	TYP	TYP
5.2.5.1	-	TYP	-	-	-	-	-	-	-	TYP	TYP
5.2.5.2											
1st paragraph	-	TYP	-	TYP and IND	-	-	-	-	-	-	-
2nd paragraph	-	-	TYP	-	-	-	-	-	-	-	TYP
5.2.5.3	-	TYP	-	TYP	-	-	-	-	-	TYP	TYP
NOTE 1 The type test is indicated as "TYP".											
NOTE 2 The individual test is indicated as "IND".											

iTeh STANDARD PREVIEW  
 (standards.iteh.ai)  
 EN 1028-2:2002+A1:2008  
 4caba6eabc7c/sis-em-1028-2-2003a1-2008