



**SLOVENSKI STANDARD**  
**SIST EN 1293:2000**

**01-november-2000**

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**Splošne zahteve za sestavne dele, ki se uporabljajo za tlačne kanalizacijske sisteme in drenaže**

General requirements for components used in pneumatically pressurized discharge pipes, drains and sewers

Allgemeine Anforderungen an Bauteile von pneumatisch betriebenen Abwasserdruckleitungen

Prescriptions générales pour les composants utilisés dans les réseaux d'évacuation, de branchement et d'assainissement sous pression pneumatique

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**Ta slovenski standard je istoveten z: EN 1293:1999**

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**ICS:**

93.030      Zunanji sistemi za odpadno vodo      External sewage systems

**SIST EN 1293:2000**

**en**

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## General requirements for components used in pneumatically pressurized discharge pipes, drains and sewers

Prescriptions générales pour les composants utilisés dans les réseaux d'évacuation, de branchement et d'assainissement sous pression pneumatique

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This European Standard was approved by CEN on 16 December 1998.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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## FOREWORD

This European Standard has been prepared by Technical Committee CEN/TC 165 "Waste water engineering", 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 October 1999, and conflicting national standards shall be withdrawn at the latest by October 1999.

This European Standard 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).

This European Standard provides the basis for the preparation or revision of product standards for discharge pipes, drains and sewers operating as pneumatically pressurized systems (see clause 1 "Scope")

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 1. Scope

This standard specifies general requirements for components for use in pneumatically pressurized discharge pipes, drains and sewers.

This European Standard provides the general basis for the preparation or revision of product standards. Some of the provisions may need modifications when drafting harmonized European Standards. It is not applicable for the evaluation of products.

It is applicable as a reference for drawing up a product specification, if there is no product standard available.

Components covered are pipes, fittings and joints.

This European standard includes marking, quality control and optional certification requirements.

Components are those used in systems that convey in a satisfactory manner:

- domestic wastewater;
- rainwater and surface water;
- other waste waters (e.g. industrial wastewater) that will not damage the components.

This European standard applies equally to components which are factory-made and to those constructed on site, where applicable.

## 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.

EN 681-1	Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications - Part 1 : Vulcanized rubber.
prEN 681-2	Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications - Part 2 : Thermoplastic elastomers.
prEN 805:1996	Water supply - Requirements for systems and components outside buildings
EN ISO 9001:1994	Quality systems - Model for quality assurance in design, development, production, installation and servicing (ISO 9001 : 1994)
EN ISO 9002:1994	Quality systems - Model for quality assurance in production, installation and servicing (ISO 9002 : 1994)
EN 45011	General requirements for bodies operating product certification systems (ISO/IEC Guide 65:1996)
EN 45012	General requirements for bodies operating assessment and certification/registration of quality systems (ISO/IEC Guide 62:1996)
ISO 48	Rubber, vulcanized or thermoplastic - Determination of hardness (Hardness between 10 IRHD and 100 IRHD)

### 3. Definitions, symbols and abbreviations

For the purposes of this standard, the following definitions apply:

- 3.1 adjustable joint:** Joint which permits significant angular deflection at the time of installation but not thereafter.
- 3.2 allowable maximum operating pressure PMA:** Maximum hydrostatic pressure including surge that a component can withstand from time to time in service.
- 3.3 allowable operating pressure PFA:** Maximum hydrostatic pressure that a component can withstand continuously in service.
- 3.4 allowable test pressure PEA:** Maximum hydrostatic pressure that a newly installed component can withstand for a relatively short duration when either fixed above ground level or laid and backfilled under-ground, in order to ensure the integrity and tightness of the pipeline.
- 3.5 external diameter OD:** Mean external diameter of the pipe barrel at any cross section. For pipes with external profiles on the barrels, the external diameter is the maximum diameter when viewed in cross section.
- 3.6 factory production control:** Surveillance mode in which a manufacturer performs its own surveillance on the result of its production according to a set of rules formally specified in quality assurance or quality management provision.
- 3.7 flexible joint:** Joint which permits significant angular deflection, both during and after installation and which can accept a slight offset of the centre line.
- 3.8 joint:** Connection between the adjacent ends of two components including the means of sealing.
- 3.9 mean internal diameter ID:** Mean internal diameter of the pipe barrel at any cross section.
- 3.10 nominal size DN:** Numerical designation of size of component, which is a convenient integer approximately equal to a manufacturing dimension in mm. This can apply to either the internal diameter (DN/ID) or the external diameter (DN/OD).
- 3.11 pipe barrel:** Cylindrical part of the pipe with a uniform cross section excluding socket and spigot.
- 3.12 pneumatically pressurized system:** System where flow is caused by pneumatic pressure and where the pipe normally operates full. The pneumatic pressure can be applied either as compressed air upstream or partial vacuum downstream.
- 3.13 proof load:** Specified test load which a component withstands where the related requirements of the product standard are met.
- 3.14 quality control system:** Organizational structure, responsibilities, procedures, processes and resources for implementing quality management.
- 3.15 rigid joint:** Joint that does not permit significant angular deflection, either during or after installation.
- 3.16 ring stiffness:** Resistance of a pipe to diametrical deflection in response to external loading applied along one diametric plane is given as follows :

$$S = \frac{EI}{D_m^3}$$

where :

$S$  is the ring stiffness of the pipe in kilonewtons per square metre;

$E$  is the modulus of elasticity in flexure in the circumferential direction in kilonewtons per square metre;

$I$  is second moment of area of the pipe wall in the longitudinal direction, per unit length, in metre to the fourth power per metre;

$D_m$  is the diameter of the neutral axis of the pipe wall, in metre.

**3.17 ultimate load:** That load which causes failure of component (under test) which shall be as specified in product standards.

## 4. Functional and dimensional requirements

Product standards may include specifications which are more stringent, but not less stringent than those of this European Standard.

### 4.1 Dimensions of pipes and fittings

#### 4.1.1 Nominal sizes

Nominal sizes DN shall be given in product standards as DN/ID or DN/OD.

Nominal sizes specified in product standards should preferably be selected from table 1 or table 2.

Other nominal sizes may be specified in product standards.

**Table 1: Nominal sizes DN/ID**

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30, 40, 50, 60, 80, 100, 125, 150, 200.

**Table 2: Nominal sizes DN/OD**

32, 40, 50, 63, 75, 90, 100, 110, 125, 140, 160, 180, 200.
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#### 4.1.2 Internal diameters and limit deviations

Product standards shall specify :

- internal diameters and limit deviations, or
- external diameters, wall thicknesses and limit deviations, or
- minimum bores (see 5.1).

Limit deviations on the internal diameter are shown in table 3:

**Table 3: Limit deviations on internal diameters**

Nominal size	Limit deviations on mean internal diameter mm	Limit deviations on individual internal diameter mm
DN ≤ 100	± 0,05 DN	± 0,1 DN
100 < DN ≤ 200	± 5	± 10

NOTE: DN in Table 3 can be applied to either DN/ID or DN/OD.



## 4.2 Geometry of pipes

Except in the case of pipes delivered in coils, pipes shall be straight, within tolerances specified in product standards (see 5.2). If pipes are delivered in coils, product standards shall specify a minimum radius of the coils.

The angle between the planes of the end faces of the pipe and the relevant axis shall be  $90^\circ$  with a tolerance such that the function of the pipe joint shall not be impaired (see 5.3).

A range of pipe lengths can be specified in product standards.

Limit deviations on the wall thickness and the pipe length shall be specified in product standards where the thickness and/or the length themselves are not specified, product standards shall require the manufacturer to declare the limit deviations.

## 4.3 Geometry of fittings

### 4.3.1 General

Angles for fittings shall be stated in the product standards.

Where applicable, tolerances on angles shall be specified in product standards.

### 4.3.2 Bends

Angles  $\alpha$  for bends shall be specified in product standards. Angles  $\alpha$  should preferably be selected from table 4.

**Table 4: Angles  $\alpha$  for bends**

11°15', 15°, 20° to 22°30', 30°, 45°, 60°, 90°
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Other angles  $\alpha$  may be allowed in product standard.

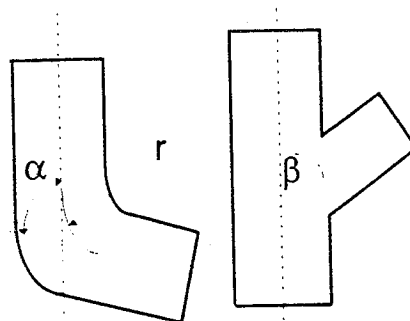
NOTE: Radii  $r$  for bends should be specified in product standards.

### 4.3.3 Branches

Angles  $\beta$  for branches specified in product standards should preferably be selected from table 5.

**Table 5: Angles  $\beta$  for branches**

45°, 60°, 90°
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**Figure 1: Illustrations of angles and radius of fittings**