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**Keramične cevi, fazonski kosi in spoji za odvod odpadne vode in kanalizacijo - 4.**  
**del: Zahteve za posebne fazonske in prilagodilne kose**

Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 4:  
Requirements for special fittings, adaptors and compatible accessories

Steinzeugrohre und Formstücke sowie Rohrverbindungen für Abwasserleitungen und -  
kanäle - Teil 4: Anforderungen an Sonderformstücke, Übergangsbauerteile und  
Zubehörteile

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Tuyaux et accessoires en gres et assemblages de tuyaux pour les réseaux de  
branchement et d'assainissement - Partie 4: Prescriptions pour accessoires spéciaux,  
pieces d'adaptation et accessoires compatibles

**Ta slovenski standard je istoveten z: EN 295-4:1995**

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**ICS:**

23.040.50	Cevi in fitingi iz drugih materialov	Pipes and fittings of other materials
91.140.80	Drenažni sistemi	Drainage systems
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

**SIST EN 295-4:1996****en**

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

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ICS 23.040.30; 23.040.50

Descriptors: water pipelines, sewage, pipes : tubes, accessories, sandstone products, quality control, tests, sampling

English version

**Vitrified clay pipes and fittings and pipe joints for  
drains and sewers - Part 4: Requirements for  
special fittings, adaptors and compatible  
accessories**

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# CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents	Page
Foreword	3
1. Scope	4
2. Normative references	4
3. Definitions	4
4. Requirements	4
4.1 Materials and manufacture	4
4.2 Minimum bore	5
4.3 Length	5
4.4 Angles	5
4.5 Joint interchangeability	5
4.6 Bond strength of adhesive for fixing fired vitrified clay parts together	5
4.7 Water seal of special fittings	5
4.8 Impermeability of special fittings	5
4.9 Chemical resistance	5
4.10 Joint assemblies	5
5. Sampling for tests	6
6. Designation	6
7. Marking	7
8. Quality control	7
Annex A (normative)	8
Annex B (normative)	12
Annex C (normative)	14

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## Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 165 "Waste water engineering", the secretariat of which is held by DIN.

The parts of this Standard are

- EN 295 - 1   Vitrified clay pipes and fittings for drains and sewers - Part 1 : Requirements
- EN 295 - 2   Vitrified clay pipes and fittings for drains and sewers - Part 2 : Quality control
- EN 295 - 3   Vitrified clay pipes and fittings for drains and sewers - Part 3 : Test methods
- EN 295 - 4   Vitrified clay pipes and fittings for drains and sewers - Part 4 : Requirements for special fittings, adaptors and compatible accessories
- EN 295 - 5   Vitrified clay pipes and fittings for drains and sewers - Part 5 : Requirements for perforated vitrified clay pipes and fittings
- prEN 295 - 6   Vitrified clay pipes and fittings for drains and sewers - Part 6 : Requirements for vitrified clay manholes
- prEN 295 - 7   Vitrified clay pipes and fittings for drains and sewers - Part 7 : Requirements for vitrified clay pipes and joints for pipe jacking.

On drafting this standard the provisional results already available of CEN/TC 165/WG1 "General requirements on pipes, fittings, pipe joints including sealings and manholes" or other relevant working group of TC 165 with general responsibilities were taken into account. When further results are received, any necessary amendments will be made.

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 1995, and conflicting national standards shall be withdrawn at the latest by March 1996.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

## 1 Scope

This Standard specifies the requirements for special fittings, adaptors and compatible accessories made from vitrified clay and/or other suitable materials for use with vitrified clay pipes and fittings in drainage and sewerage systems. It does not apply to items which are specified in other parts of EN 295. Any additional requirements for particular items are given in the annexes to this part of the standard.

Where this Standard provides for different systems of jointing dimensions, different lengths and different types of fittings, the specifiers/purchasers may select according to their requirements.

NOTE 1: The wide diversity of ranges and numbers of special fittings, adaptors and compatible accessories offered by manufacturers and required by specifiers and purchasers throughout Europe cannot be fully listed within this standard. Manufacturers' product range lists and specifications provide the necessary information.

NOTE 2: Where reference is made to clauses in EN 295-1 : 1991, EN 295-2 : 1991 or EN 295-3 : 1991 this is clearly stated.

## 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. Further details are given in normative annexes A, B and C.

EN 295-1 : 1991	Vitrified clay pipes and fittings and pipe joints for drains and sewers : Part 1 : Requirements.
EN 295-2 : 1991	Vitrified clay pipes and fittings and pipe joints for drains and sewers : Part 2 : Quality control and sampling.
EN 295-3 : 1991	Vitrified clay pipes and fittings and pipe joints for drains and sewers : Part 3 : Test methods.

ISO/DIS 4633 : 1986 Rubber seals - Joint rings for water supply, drainage and sewerage pipelines - Specification for materials.

EN 10002 - 2 : 1992 Tensile testing of metallic materials - Part 2 : verification of the force measuring system of the tensile testing machine.

## 3 Definitions

### 3.1 Special fittings

Any fittings made from vitrified clay and/or other suitable materials which are not covered by the fitting groups used in table 2 of EN 295-2 : 1991.

### 3.2 Adaptors

Special items, made from vitrified clay and/or other suitable materials, to join together vitrified clay pipes and fittings of different jointing systems permitted in EN 295-1 or to join them to items of other pipeline materials.

### 3.3 Compatible Accessories

Accessories made from vitrified clay and/or other suitable materials designed to be incorporated into a system which includes pipes and/or fittings specified to any part of EN 295.

## 4 Requirements

### 4.1 Materials and manufacture

#### 4.1.1 Vitrified clay

All vitrified clay elements of special fittings, adaptors and compatible accessories shall comply with 2.1 of EN 295-1 : 1991.

#### 4.1.2 Vulcanised rubber sealing materials

Vulcanised rubber sealing materials shall comply with ISO/DIS 4633 : 1986. Where vulcanised rubber sealing elements are permanently attached to vitrified clay components of adaptors, special fittings or compatible accessories they shall fulfill the additional requirement of 3.1.1 of EN 295-1 : 1991 when tested in accordance with clause 14 of EN 295-3 : 1991.

#### 4.1.3 Polyurethane sealing materials

Polyurethane sealing materials shall comply with the requirements of table 7 of EN 295-1 : 1991, when tested in accordance with clause 15 of EN 295-3 : 1991.

#### 4.1.4 Other materials

All other materials used in special fittings, adaptors or compatible accessories shall comply with the material requirements of any relevant annex. Otherwise they shall comply with the pipe and fittings manufacturer's declared specification, which shall include requirements for long term behaviour.

#### 4.1.5 Manufacture

Special fittings, adaptors and compatible accessories shall be free from such defects as would impair their function when in service.

#### 4.2 Minimum bore

The minimum permissible bore of pipeline connections to pipes and fittings specified in EN 295-1 : 1991 shall be as specified in 2.2 of EN 295-1 : 1991.

#### 4.3 Length

The nominal length of straight special fittings shall be specified by the manufacturer. The limits of tolerance on this length shall be -1 % and +4 % measured to the nearest whole mm, with a minimum of  $\pm 10$  mm.

#### 4.4 Angles

Special fittings which include branches shall have preferred nominal angles of 45 ° and 90 °. The preferred nominal angle of surface rodding points is 45 °. The tolerance for the branch angle shall be  $\pm 5$  ° on the manufacturer's nominal value.

#### 4.5 Joint interchangeability

The dimensions of the jointing systems used to connect special fittings, adaptors or compatible accessories to vitrified clay pipelines shall conform to the requirements of 3.6 of EN 295-1 : 1991.

#### 4.6 Bond strength of adhesive for fixing fired vitrified clay parts together

When tested in accordance with clauses 7 and 20 of EN 295-3 : 1991, the bond strength of the adhesive shall be as specified in 2.12 of EN 295-1 : 1991.

#### 4.7 Water seal of special fittings

Trapped special fittings for drainage outside buildings and for sewerage shall provide a minimum water seal depth of 50mm.

#### 4.8 Impermeability of special fittings

Where applicable, when tested in accordance with clause 13 of EN 295-3 : 1991 either using an air or water test, the impermeability of special fittings shall be as specified in 2.18 of EN 295-1 : 1991.

#### 4.9 Chemical Resistance

##### 4.9.1 Vitrified clay

Elements of special fittings adaptors and compatible accessories specified in this standard made from vitrified clay are resistant to chemical attack. For special circumstances of application the chemical resistance of vitrified clay elements may be determined by the use of the test in clause 10 of EN 295-3 : 1991.

##### 4.9.2 Other Materials

The chemical resistance of elements made from other materials shall comply with the relevant specifications.

#### 4.10 Joint assemblies

##### 4.10.1 Vitrified clay pipeline systems

When tested in accordance with clauses 18, 20 and 21 of EN 295-3 : 1991, joint assemblies formed using the jointing systems permitted in 3.6 of EN 295-1 : 1991 shall where applicable satisfy the requirements of 3.2.1, 3.3, 3.4, 3.7.1, 3.8 and 3.9 of EN 295-1 : 1991 for watertightness, deflection, shear resistance and chemical and physical resistance to effluent and thermal stability.

## 4.10.2 Vitrified clay to pipelines of other materials

4.10.2.1 When tested in accordance with clauses 18, 20 and 21 of EN 295-3 : 1991 joint assemblies connecting vitrified clay pipelines to pipelines of other materials which do not undergo significant diametral deflection under shear test load (e.g. concrete, cast iron, ductile iron, steel and fibre-cement) shall satisfy the requirements of 3.2.1, 3.3, 3.4, 3.7.1, 3.8 and 3.9 of EN 295-1 : 1991 for water tightness, deflection, shear resistance, chemical and physical resistance to effluent and thermal stability.

4.10.2.2 When tested in accordance with clauses 18 and 20 of EN 295-3 : 1991 joint assemblies connecting vitrified clay pipelines to pipelines of materials which undergo significant diametral deflection under shear test load (e.g. PVC-U, PE, PP and GRP) shall also satisfy the requirements of 3.2.1, 3.3, 3.4, and 3.7.1 of EN 295-1 : 1991, with the exception that, for 3.4, when the shear load is applied to the flexible pipe, the applied load shall be that required to produce a diametral deflection of  $(3 \pm 0,5) \%$  on the external diameter.

## 5 Sampling for Tests

Sampling for special fittings, adaptors and compatible accessories shall be in accordance with Table 1, where applicable.

Sampling is specified in EN 295-2 : 1991, in which the specification clause numbers refer to EN 295-1 : 1991. Table 1 gives the cross-reference between the relevant corresponding clauses of EN 295-4 : 1991 and EN 295-1 : 1991, and the applicable EN 295-2 : 1991 clause numbers.

## 6 Designation

The following shall be used for the designation of special fittings, adaptors and compatible accessories.

Block 1	Description
Block 2	EN 295-4
Block 3	Individual item block
Block 3.1	Nominal size(s) applicable
Block 3.2	Joining system, where appropriate.

Example: STOPPER EN 295-4 -DN150-E

Description	
Standard number	
Nominal size applicable	
Joining system	

Table 1 : Sampling

Requirement	Clause No. EN 295-4 : 1991	Corres- ponding Clause No. EN 295-1 : 1991	Sampling Clause No. EN 295-2 : 1991
Vitrified clay	4.1.1	2.1	3.1
Rubber sealing materials	4.1.2	3.1.1	3.11
Polyurethane	4.1.3	3.1.2	3.10
Minimum bore	4.2	2.2	3.5
Length	4.3	2.3	3.5
Angle	4.4	2.8	3.5
Joint Inter- changeability	4.5	3.6	3.5, 3.12
Bond strength of adhesive	4.6	2.12	3.7, 3.8
Water seal	4.7	2.6	3.6
Impermeability	4.8	2.18	3.6
Chemical resistance	4.9	2.15	3.7
Watertightness	4.10	3.2	3.13
Deflection	4.10	3.3	3.13
Shear resistance	4.10	3.4	3.13
Chemical & Physical resistance to effluent	4.10	3.7.1	3.13
Thermal cycling stability	4.10	3.8	3.13.3
Long-term thermal stability	4.10	3.9	3.13.3



## 7 Marking

7.1 All special fittings, adaptors, couplings and compatible accessories shall be marked with :

- EN 295-4
- CE marking (To be added after the relevant requirements have been met)
- identification symbol of the third party certification body
- manufacturer's identification
- date of manufacturing
- nominal size (DN....) or OD size range
- dimensional jointing system of EN 295 if appropriate
- other applicable pipeline system if appropriate
- type of coupling if appropriate (annex A).
- recommended assembly torque and assembly tool if appropriate (annex A)

This marking shall preferably be impressed before firing vitrified clay elements, or, if this is not possible, shall be indelibly done after firing. Marking on components made from other materials shall also be impressed or indelible.

SIST EN 295-4:1996

7.2 Products shall be marked with the number of this standard only if certified in accordance with clause 8 by a third party certification body.

## 8 Quality control

Quality control shall be in accordance with EN 295-2 : 1991.