SLOVENSKI STANDARD

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Keramiļne cevi, fazonski kosi in spoji za odvod odpadne vode in kanalizacijo - 10. del: Zahtevane lastnosti

Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 10: Performance requirements

Steinzeugrohre und Formstücke sowie Rohrverbindungen für Abwasserleitungen und -kanäle - Teil 10: Leistungsanforderungen

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Tuyaux et accessoires en gres et assemblages de tuyaux pour les réseaux de branchement et d'assainissement - Partie 10 : Exigences de performance

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 295-10

March 2005

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English version

Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 10: Performance requirements

Tuyaux et accessoires en grès et assemblages de tuyaux pour les réseaux de branchement et d'assainissement - Partie 10 : Exigences de performance

Steinzeugrohre und Formstücke sowie Rohrverbindungen für Abwasserleitungen und -kanäle - Teil 10: Leistungsanforderungen

This European Standard was approved by CEN on 17 January 2005.

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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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 295-10:2005) 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of an identical text or by endorsement, at the latest by August 2005, and conflicting national standards shall be withdrawn at the latest by December 2006.

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 document contains only the performance requirements needed to meet the requirements of EU Directive(s). It does not indicate the quality of products. This is specified in the standards series EN 295 for vitrified clay pipes, fittings and pipe joints for drains and sewers, which consists of the following Parts:

— Part 1: Requirements,

— Part 2: Quality control,

— Part 3: Test methods,

— Part 4: Requirements for special fittings, adaptors and compatible accessories,

— Part 5: Requirements for perforated vitrified clay pipes and fittings,

— Part 6: Requirements for vitrified clay manholes,

— Part 7: Requirements for vitrified clay pipes and joints for pipe jacking.

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

1 Scope

This document specifies performance requirements for:

— vitrified clay pipes, fittings and pipe joints as defined in EN 295-1,

— special fittings, adaptors and compatible accessories as defined in EN 295-4,

— perforated vitrified clay pipes and fittings as defined in EN 295-5,

— vitrified clay manholes as defined in EN 295-6,

— vitrified clay pipes and joints for pipe jacking as defined in EN 295-7,

for buried drain or sewer systems for the conveyance of sewage and surface water (including rain water) under gravity or occasionally at low head of pressure. It specifies the evaluation of conformity for the performance requirements of products according to this document.

2 Normative references

The following referenced documents are indispensable for the application 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.

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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*

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EN 295-3:1991, *Vitrified clay pipes and fittings and pipe joints for drains and sewers — Part 3: Test methods.*

EN 295-4:1995, *Vitrified clay pipes and fittings and pipe joints for drains and sewers — Part 4: Requirements for special fittings, adaptors and compatible accessories.*

EN 295-5:1994, *Vitrified clay pipes and fittings and pipe joints for drains and sewers — Part 5: Requirements for perforated vitrified clay pipes and fittings.*

EN 295-6:1995, *Vitrified clay pipes and fittings and pipe joints for drains and sewers — Part 6: Requirements for vitrified clay manholes.*

EN 295-7:1995, *Vitrified clay pipes and fittings and pipe joints for drains and sewers — Part 7: Requirements for vitrified clay pipes and joints for pipe jacking.*

EN ISO 9001, *Quality management systems — Requirements (ISO 9001:2000).*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 295-1 to EN 295-7 apply.

4 Requirements

4.1 General

Products according to this document (EN 295-10) shall be designed so as to protect people and the immediate environment against pollutants transported in waste water disposal systems. This is ensured by the products meeting the technical requirements of EN 295-1 to -7.

All requirements specified in this clause are to be tested according to the test methods referred to in the appropriate clause of the relevant part of EN 295.

4.2 Vitrified clay pipes and fittings and their joints

4.2.1 Materials

The material for pipes and fittings shall conform to EN 295-1:1991, 2.1.

The materials for joints shall conform to EN 295-1:1991, 3.1.

4.2.2 Dimensional tolerances

The minimum permissible bore shall be in accordance with EN 295-1:1991, 2.2.

The tolerance of the nominal length of a pipe shall be in accordance with EN 295-1:1991, 2.3.

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The deviation from straightness of a pipe shall be in accordance with EN 295-1:1991, 2.5.

The squareness of the ends of pipes and fitting shall be in accordance with EN 295-1:1991, 2.4.

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The tolerances on curvature of bends shall be in accordance with EN 295-1:1991, 2.7.

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The tolerance of branches shall be in accordance with EN 295-1:1991, 2.8.

The dimensional tolerances of joint assemblies shall be in accordance with EN 295-1:1991, 3.5, when tested according to EN 295-3:1991, Clause 19 and shall be in accordance with EN 295-1:1991, 3.6.

4.2.3 Strength

The crushing strength (*FN*) of pipes and pipe sections shall not be less than given in EN 295-1:1991, 2.9 or 2.10.

The bond strength for fixed fired vitrified clay parts shall be in accordance with EN 295-1:1991, 2.12.

Vitrified clay pipes and fittings are resistant to fatigue load according to EN 295-1:1991, 2.13. Where required, the fatigue strength shall be proved by testing in accordance with EN 295-3:1991, Clause 8.

The bending moment resistance of pipes shall be in accordance with EN 295-1:1991, 2.11.

4.2.4 Gas- and liquid-tightness of pipes, fittings and their joints

Pipes and fittings shall be water-tight in accordance with EN 295-1:1991, 2.14.

Pipes, fittings and pipe sections shall be gas tight in accordance with EN 295-1:1991, 2.18.

Trapped fittings for drainage systems outside buildings and for sewers shall have a minimum water seal depth of 50 mm.

Assembled joints shall be water-tight in accordance with EN 295-1:1991, 3.2, 3.3 and 3.4.

4.2.5 Durability

Vitrified clay pipes and fittings are resistant to chemical attack and mechanical damage by abrasion according to EN 295-1:1991, 2.15 and 2.17. Where required, this shall be proved by testing in accordance with EN 295-3:1991, Clauses 10 and 12.

Assembled joints shall be resistant to shear loads in accordance with EN 295-1:1991, 3.4 by testing in accordance with EN 295-3:1991, Clause 18.

Assembled joints shall be chemically and physically resistant against effluents in accordance with EN 295-1:1991, 3.7 by testing in accordance with EN 295-3:1991, Clause 20. They shall also be resistant against thermal cycling in accordance with EN 295-1:1991, 3.8 and shall have a long term thermal stability according to EN 295-1:1991, 3.9.

4.3 Special fittings, adaptors and compatible accessories

4.3.1 Materials

The material for special fittings, adaptors and compatible accessories shall conform to EN 295-4:1995, 4.1.

4.3.2 Dimensional tolerances

The dimensional tolerances shall be in accordance with EN 295-4:1995, 4.2, 4.3, 4.4 and 4.5.

4.3.3 Strength

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The bond strength for fixed fired vitrified clay parts shall be in accordance with EN 295-4:1995, 4.6.

4.3.4 Gas- and liquid-tightness

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Special fittings shall be gas-tight in accordance with EN 295-1:1991, 2.18 when tested according to EN 295-3:1991, Clause 13 using the air test or shall be water-tight in accordance with EN 295-1:1991, 2.14 when tested according to EN 295-3:1991, Clause 9 using the water test.

Trapped fittings for drainage systems outside buildings and for sewers shall have a minimum water seal depth of 50 mm.

If special fittings, adaptors and compatible accessories are used for joint assemblies, they shall conform to the requirements and test methods given in EN 295-4:1995, 4.10.

4.3.5 Durability

Special fittings, adaptors and compatible accessories are resistant to chemical attack according to EN 295-4:1995, 4.4.1. Where required, this shall be proved by testing in accordance with EN 295-3:1991, Clause 10.

Clay components are resistant to mechanical damage by abrasion according to EN 295-1:1991, 2.17. Where required, abrasion resistance shall be proved by testing in accordance with EN 295-3:1991, Clause 12.

4.4 Perforated vitrified clay pipes

4.4.1 Materials

The material for perforated pipes and fittings shall conform to EN 295-5:1994, 4.1.

4.4.2 Dimensional tolerances

The dimensional tolerances shall be in accordance with EN 295-5:1994, 4.2, 4.3, 4.4, 4.5, 4.6 and 4.7.

4.4.3 Strength

The crushing strength (*FN*) of perforated pipes and fittings shall not be less than given in EN 295-5:1994, 4.8.

The bond strength of adhesives for fixed fired vitrified clay parts shall be in accordance with EN 295-5:1994, 4.9.

4.4.4 Durability

Perforated vitrified clay pipes and fittings are resistant to chemical attack according to EN 295-5:1994, 4.10. Where required, this shall be proved by testing in accordance with EN 295-3:1991, Clause 10.

4.5 Vitrified clay manholes

4.5.1 Materials

The material for vitrified clay manholes shall conform to EN 295-6:1995, 4.1.

4.5.2 Dimensional tolerance

The dimensional tolerances shall be in accordance with EN 295-6:1995, 4.2, 4.3, 4.4 and 4.5.

4.5.3 Strength

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The crushing strength (*FN*) of manhole and inspection shafts shall not be less than given in EN 295-6:1995, 4.6 and 4.8.

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Vitrified clay pipes and fittings are resistant to fatigue strength according to EN 295-6:1995, 4.9. Where required, this shell be proved by testing in accordance with EN 295-3:1991, Clause 8.

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4.5.4 Liquid-tightness

Manholes and inspection shafts shall be water-tight in accordance with EN 295-6:1995, 4.11 and 4.12.

Jointing systems of sections and pipe connections shall be in accordance with EN 295-6:1995, 4.13.

4.5.5 Durability

Vitrified clay manholes and inspection shafts are resistant to chemical attack according to EN 295-6:1995, 4.10. Where required, this shall be proved by testing in accordance with EN 295-3:1991, Clause 10.

4.6 Vitrified clay pipes and joints for pipe jacking

4.6.1 Materials

The material for vitrified clay jacking pipes shall conform to EN 295-7:1995, 4.1.

4.6.2 Dimensional tolerances

The dimensional tolerances shall be in accordance with EN 295-7:1995, 4.2, 4.3, 4.4, 4.5, 4.6 and 4.7.

4.6.3 Strength

The crushing strength (*FN*) of vitrified clay jacking pipes shall not be less than given in EN 295-7:1995, 4.8.1.

Vitrified clay jacking pipes are resistant to fatigue load according to EN 295-7:1995, 4.8.7. Where required, the fatigue strength shall be proved by testing in accordance with EN 295-3:1991, Clause 8.

The compressive strength of vitrified clay jacking pipes shall not be less than given in EN 295-7:1995, 4.8.2.

4.6.4 Liquid-tightness

Jacking pipes shall be water-tight in accordance with EN 295-7:1995, 4.9.

Jointing systems of sections and pipe connections shall be in accordance with EN 295-7:1995, 5.3, 5.4 and 5.5.

4.6.5 Durability

Vitrified clay jacking pipes and fittings are resistant to chemical attack and mechanical damage by abrasion according to EN 295-7:1995, 4.10 and 4.12. Where required, this shall be proved by testing in accordance with EN 295-3:1991, Clauses 10 and 12.

Assembled joints shall be resistant to shear loads in accordance with EN 295-7:1995, 5.5, when tested in accordance with EN 295-3:1991, Clause 18.

Assembled joints shall be chemically and physically resistant against effluents in accordance with EN 295-7:1995, 5.6, when tested in accordance with EN 295-3:1991, Clause 20. They shall also be resistant against thermal cycling in accordance with EN 295-7:1995, 5.7 and shall have a long term thermal stability in accordance with EN 295-7:1995, 5.8.

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5 Evaluation of conformity

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5.1 General

The compliance of vitrified clay pipes, fittings and pipe joints and manholes for drains and sewers with the requirements of this document and with the stated values (including classes) shall be demonstrated by:

— initial type testing,

— factory production control by the manufacturer, including product assessment.

Third party control is recommended. If third party control is carried out, this shall be in accordance with EN 295-2.

5.2 Type testing (initial testing of the product)

Initial type testing shall be performed to demonstrate conformity to this document. Tests previously performed in accordance with the provisions of this document (same product, same characteristic(s), same (or more demanding) test method, same sampling procedure, etc.) may be taken into account. In addition, initial type testing shall be performed at the beginning of the production of a new type of product according to this standard or at the beginning of a new method of production (where this may affect the stated properties). In case of significant changes in design, the raw material and/or components and supplier of components, which could significantly influence the characteristics of the product and/or the manufacturing process, the relevant type tests shall be repeated.

For every change in design of joints, and for new jointing materials, the water-tightness of the joint shall be tested according to the requirements of EN 295-1:1991, 3.2, 3.3, 3.4, 3.5, 3.8 and 3.9.

Three complete specimens of components according to this document shall be tested in accordance with the test methods given for the requirement of each performance characteristic (where testing is required), and

each shall comply with all the requirements of Clause 4. The three specimens shall be chosen at random and shall be fully representative of the manufacturer's normal production.

Full reports of these tests shall be retained by the manufacturer and shall be available to a third party (if applicable) for examination.

Complete test reports shall be kept by the manufacturer for at least 10 years.

5.3 Factory production control (FPC)

5.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market conform with the stated performance requirements. The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product in such a way as to ensure the conformity of the products with the requirements of this part of the standard during the whole period of manufacture.

An FPC system conforming with the requirements of EN ISO 9001, and made specific to the requirements of this part of the standard, is considered to satisfy the above requirements.

For the purposes of testing, products may be grouped into families, where it is considered that a test for a characteristic on any one product within a family is representative of all products within that family.

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The results of inspections, tests or assessments requiring action shall be recorded, as shall any action taken. The quality records shall include all steps of the production from receipt of raw material up to the delivery of the finished product and shall describe all elements including the procedures being applied to the surveillance of the production process and to test the characteristics of the products. The documentation shall be appropriate to the manufacturing process and kept up-to-date. The controls shall be carried out in each production plant and the characteristics to be controlled according to Table 1 to Table 5 shall be established for the products.

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If during the factory production control non-conforming products are identified, they shall be segregated and excluded from delivery, and instructions given for further handling, storage, marking and use.

5.3.2 Equipment

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

5.3.3 Product testing and evaluation

The manufacturer shall establish procedures to ensure that the stated values of all of the characteristics are maintained. The characteristics and the product testing shall conform to Table 1 to Table 5. Conformity of products representative of the production to the relevant requirements specified in Table 1 to Table 5 with the tests, test procedures and test frequencies shall be established.