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Vitrified clay pipe systems for drains and sewers – Part 5: Requirements for perforated pipes and fittings

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Denna standard ersätter SS-EN 295-10:2006, utgåva 1; SS-EN 295-5, utgåva 1 och SS-EN 295-5/A1, utgåva 1.

The European Standard EN 295-5:2013 has the status of a Swedish Standard. This document contains the official version of EN 295-5:2013.

This standard supersedes the Swedish Standard SS-EN 295-10:2006, edition 1; SS-EN 295-5, edition 1 and SS-EN 295-5/A1, edition 1.

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Denna standard är framtagen av kommittén för Avloppsteknik, SIS/TK 198/AG 165.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 295-5

February 2013

ICS 93.030

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English Version

Vitrified clay pipe systems for drains and sewers - Part 5: Requirements for perforated pipes and fittings

Systèmes de tuyaux en grès vitrifié pour les collecteurs d'assainissement et les branchements - Partie 5: Exigences applicables aux tuyaux perforés et raccords

Steinzeugrohrsysteme für Abwasserleitungen und -kanäle - Teil 5: Anforderungen an gelochte Rohre und Formstücke

This European Standard was approved by CEN on 1 December 2012.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

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Foreword

This document (EN 295-5:2013) has been prepared by Technical Committee CEN/TC 165 “Wastewater 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of an identical text or by endorsement, at the latest by August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 295-5:1994 and together with EN 295-1:2013, EN 295-2:2013, EN 295-4:2013, EN 295-6:2013 and EN 295-7:2013 it supersedes EN 295-10:2005.

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.

The main changes with respect to the previous edition are listed below:

— requirements for the resistance to high pressure water jetting added;

— requirements for water absorption added;

— reaction to fire added;

— Annex ZA added;

— editorially revised.

The standard series EN 295 "Vitrified clay pipe systems for drains and sewers" consists of the following parts:

— *Part 1: Requirements for pipes, fittings and joints*

— *Part 2: Evaluation of conformity and sampling*

— *Part 3: Test methods*

— *Part 4: Requirements for adaptors, connectors and flexible couplings*

— *Part 5: Requirements for perforated pipes and fittings* (the present document)

— *Part 6: Requirements for components of manholes and inspection chambers*

— *Part 7: Requirements for pipes and joints for pipe jacking*

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

1 Scope

This European Standard specifies requirements for perforated pipes and compatible fittings made from vitrified clay with or without sockets for use in land drains and drainage of waste tips. They are also used for percolation into the ground.

This standard specifies different strength classes and areas of perforations.

NOTE 1 The specifiers/purchasers can select them according to their requirements.

NOTE 2 Corresponding provisions for the evaluation of conformity (ITT and FPC) and sampling and those for the test methods are further specified in EN 295-2 and EN 295-3, respectively.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 295-1:2013, *Vitrified clay pipe systems for drains and sewers — Part 1: Requirements for pipes, fittings and joints*

EN 295-2:2013, *Vitrified clay pipe systems for drains and sewers — Part 2: Evaluation of conformity and sampling*

EN 295-3:2012, *Vitrified clay pipe systems for drains and sewers — Part 3: Test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 295-1:2013 and the following apply.

3.1
area of perforations
total area of holes or slots per metre length measured on the inside of the pipe

4 Requirements for pipes and fittings

4.1 Material, manufacture, water absorption and appearance

For material, manufacture, water absorption and appearance, perforated pipes and fittings shall comply with EN 295-1:2013, 5.1.

4.2 Internal diameter

The internal diameter shall not be less than the values according to Table 1.

Table 1 — Internal diameter

Nominal size DN	Minimum internal diameter mm
75	72
100	96
125	121
150	146
200	195
225	219
250	244
300	293
350	341
400	390
450	439
500	487
600	585

Other nominal sizes can be manufactured to comply with this standard, providing that the minimum internal diameter shall be not less than 97,5 % of the nominal size, rounded to the nearest whole mm.

4.3 Length

Preferred lengths of pipes and straight fittings are not specified in this standard.

The length shall be measured to the nearest whole millimetre. The tolerance on the declared nominal length of pipes and straight fittings shall be from – 2 % to + 5 %, or ± 10 mm, whichever is the larger.

4.4 Deviation from straightness

When tested in accordance with EN 295-3:2012, Clause 6, the deviation from straightness of the barrel of a pipe shall not be greater than the values given in Table 2, measured to the nearest whole millimetre.

Table 2 — Deviation from straightness

Nominal size DN	Maximum deviation from straightness mm/m of nominal length
< 150	6
≥ 150 to ≤ 250	5
> 250	4

4.5 Angle of curvature and radius of bends

The preferred nominal angles of curvature of bends are 15°; 22,5°; 30° and 45°. The tolerance on angle shall be ± 5° of the nominal value.

The centreline radius shall not be less than the nominal size in millimetres.

4.6 Branch angle of junctions

The preferred nominal angles of junction arms are 45° and 90°. The tolerance for the branch angle shall be ± 5° of the nominal value.

4.7 Perforations

4.7.1 General

The holes in perforated pipes shall be either circular or slotted, and shall be cleanly cut. They shall be positioned in rows parallel to the longitudinal axis of the pipe, the holes in each row being spaced equidistantly. The permissible deviation of the spacing between the holes in any row shall not exceed ± 20 mm. Pipes need not be perforated within 100 mm of their ends. Fittings need not be perforated.

The diameter of circular holes at the inside of the pipe shall be not greater than 13 mm. If slots are used instead of circular holes, the width of slots at the inside of the pipe shall be not greater than 8 mm.

4.7.2 Arrangement of perforations

The perforations shall be arranged in one of the following configurations shown in Figure 1:

a) totally perforated pipe (TP) which is symmetrically perforated around its entire circumference;

b) locally perforated pipe (LP) which is symmetrically perforated over up to 270° of its circumference;

c) multipurpose pipe (MP), which is symmetrically perforated over up to 120° of its circumference.

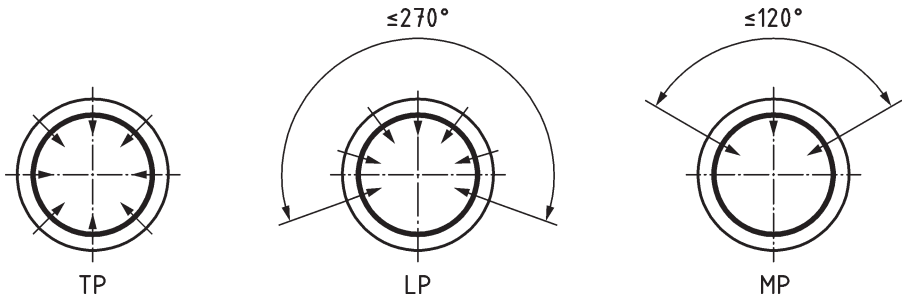

Figure 1 — Arrangement of perforations

4.7.3 Area of perforations

The total area of holes measured at the pipe internal surface shall be either:

— Type A: not less than 3 mm^2 per millimetre nominal size per metre nominal length; or

— Type B: not less than 10 000 mm^2 per metre nominal length.

4.8 Crushing strength (F_N)

When tested in accordance with EN 295-3:2012, Clause 7, with no perforations under the top bearer, the crushing strength (F_N) of pipes or pipe sections shall be not less than the values given in Tables 3 and 4.

Table 3 — Crushing strength for pipes DN 75 to DN 150

Nominal size DN	Minimum crushing strength F_N kN/m		
75	20	22	28
100	20	22	28
125	20	22	28
150	20	22	28

Higher crushing strengths may be declared for DN 75 to DN 150 pipes, provided that the increase is in steps of 6 kN/m.

Table 4 — Crushing strength for pipes ≥ DN 200

Nominal Size DN	Class		
	95	120	160
	Minimum crushing strength F_N kN/m		
200	–	24	32
225	–	28	36
250	–	30	40
300	–	36	48
350	–	42	56
400	38	48	64
450	43	54	72
500	48	60	80

The crushing strength of other nominal sizes shall be calculated in accordance with Formula (1).

$$F_N = \frac{\text{Class} \times DN}{1000} \quad (1)$$

Higher crushing strengths than those given in Table 4 can be declared providing that they conform to the requirements of the next higher class. Classes are restricted to 95, 120 and 160, thereafter in increments of 20.

NOTE For the purpose of structural design, the nominal wall thickness and/or nominal outside diameter are provided by the manufacturer.

4.9 Chemical resistance

When tested in accordance with EN 295-3:2012, Clause 13, the loss of material from the test piece shall be declared.

NOTE Under normal conditions of use, vitrified clay pipes are considered to be resistant to chemical attack and expected to show typical values of loss of material between 0,1 % and 0,25 %.