SLOVENSKI STANDARD
SIST EN 12763:2001

01-december-2001

Vlaknatocementne cevi in fazonski kosi za kanalizacijske sisteme v stavbah - Mere in tehnični dobavni pogoji

Fibre-cement pipes and fittings for discharge systems for buildings - Dimensions and technical terms of delivery

Faserzementrohre und -formstücke für Hausentwässerungssysteme - Maße und technische Lieferbedingungen

Tuyaux et raccords en fibres-ciment pour systèmes d'évacuation pour bâtiments - Dimensions et conditions techniques de livraison

Ta slovenski standard je istoveten z: **EN 12763:2000**

ICS:

23.040.50	Cevi in fitingi iz drugih materialov	Pipes and fittings of other materials
91.100.40	Cementni izdelki, ojačani z vlakni	Products in fibre-reinforced cement
91.140.80	Drenažni sistemi	Drainage systems

SIST EN 12763:2001 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12763

July 2000

ICS

English version

Fibre-cement pipes and fittings for discharge systems for buildings - Dimensions and technical terms of delivery

Tuyaux et raccords en fibres-ciment pour systèmes d'évacuation pour bâtiments - Dimensions, conditions techniques de livraison

Faserzementrohre und -formstücke für Hausentwässerungssysteme - Maße und technische Lieferbedingungen

This European Standard was approved by CEN on 27 November 1999.

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.

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

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

Ref. No. EN 12763:2000 E

Contents

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 January 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

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).

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.

This European Standard was prepared by working group 5 of CEN Technical Committee TC 165 on Waste Water Technology.

A distinction has been made between initial control of products (type tests) and internal quality control requirements (acceptance tests).

The performance of a water discharge system network constructed with these products depends not only on the properties of the product as required by this standard but also on the design and construction of the network as a whole in relation to the environment and conditions of use.

This Standard is in accordance with EN 476:1996 “General requirements for components used in discharge pipes, drains and sewers for gravity systems” established by TC 165 WG 1 and will be in accordance with other functional standards as soon as these are available.

Annexes A and B of this European Standard are normative, Annexes C, D and E are informative.

1. Scope

This European Sstandard applies to fibre-cement pipes, joints and fittings used for sewerage and rainwater discharge systems for buildings where pressure tight joints are required.

It defines general composition, classification, geometrical, mechanical and physical characteristics and quality control.

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).

ENV 197:1992 Cement - Composition, specifications and conformity criteria - Part 1: Common cements

EN 476:1997 General requirements for components used in discharge pipes, drains and sewers for gravity systems

EN 681-1:1996 Elastomeric seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 1: Vulcanized rubber

EN 10088-1:1995 Stainless steels - Part 1: List of stainless steels

EN 10088-2:1995 Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip for general purposes

EN ISO 9001 Quality systems - Model for quality assurance in design/development, production, installation and servicing (ISO 9001 : 1994)

EN ISO 9002 Quality systems - Model for quality assurance in production, installation and servicing (ISO 9002 : 1994)

ISO 390:1993 Products in fibre-reinforced cement - Sampling and inspection

ISO 898-1 Mechanical properties of fasteners - Part 1: Bolts, screws and studs

ISO 898-2 Mechanical properties of fasteners - Part 2: Nuts with specified proof load values - Coarse thread.

ISO 2602 : 1980 Statistical interpretation of test results - Estimation of the mean - Confidence interval

ISO 2859-1:1989 Sampling procedures for inspection by attributes – Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot by lot inspection

ISO 3951:1989 Sampling procedures and charts for inspection by variables for percent nonconforming

ISO 4628 Paints and varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity and size of common types of defect

ISO 7253 Paints and varnishes - Determination of resistance to neutral salt spray (fog)

3. Terms and definitions

For the purpose of this standard the following terms and definitions apply:

3.1 nominal diameter (DN)

Numerical denomination of size of a component, which is a convenient round number approximately equal to the manufacturing dimension in millimetres of the internal diameter.

3.2 acceptance test

Test to establish whether a batch of products conforms to a specification of the standard. The test is performed on samples drawn either from continuous production or from a consignment [ISO 390:1993].

NOTE: Test method, specifications and limit values are specified in this standard. Sampling levels and acceptance criteria are specified in ISO 390.

3.3 type test

Test for approval of a new product and/or a fundamental change in formulation or method of manufacture, or both. The test is performed on the as delivered product.

The type test is not to be taken as evidence of the conformity to specification of products subsequently produced in quantity [ISO 390:1993].

3.4 acceptable quality level (AQL)

When a continuous series of batches is considered, the quality level which for the purposes of sampling inspection is the limit of a satisfactory process average [ISO 2859-1 : 1989].

NOTE: A sampling scheme with an AQL of 4% means that batches containing up to 4% defective items have a high probability of acceptance.

4. Symbols and abbreviations

a	Length of machined ends
c	Length of axes
DN	Nominal diameter
d_1	Internal diameter
d_2	External diameter of the machined end
d_3	External diameter of the barrel of the pipe
e	Wall thickness
e_1	Nominal thickness of the machined end
f	Maximum deviation of straightness
l	Total length of pipe = building length
r	Minimum radius of bends
C_L	Crushing load

5. Requirements for pipes and fittings

5.1 General

Pipes and fittings shall comply with the requirements of this clause at the stage of delivery.

5.2 General composition

Products made of fibre-cement pipes according to this standard shall consist essentially of cement or a calcium silicate formed by chemical reaction of a siliceous and a calcareous material reinforced by fibres other than asbestos. The cement shall comply with relevant national standards of CEN members and/or ENV 197-1.

5.3 Pipe ends

Pipes and fittings shall have both ends plain.

NOTE: The pipes can have machined or unmachined ends.

5.4 General appearance and finish

The pipes shall be straight, uniform and regular. The shape of the finished end shall be fixed by the manufacturer to suit the type of joint used.

The end faces of pipes and fittings shall be free from breakouts and machining burrs and shall be perpendicular to the pipe axis.

NOTE If necessary, the pipes may be impregnated and/or coated internally and/or externally to meet special working conditions as agreed between manufacturer and customer. The coating and finish should comply with the relevant national standards, if existing.

5.5 Smoothness of bore

The internal surface of the pipe shall be regular and smooth. Slight scratches, indentations or small protrusions that do not affect the intended use or efficiency shall be acceptable.

5.6 Geometrical characteristics

5.6.1 Diameters, wall thickness

Internal diameters d_1 and wall thickness e shall be as given in table 1. For pipes, the symbols for dimensions to be measured are given in figure 1. External diameters d_2 and d_3 and tolerances shall be stated by the manufacturer. External diameters d_3 shall be observed along the whole length of the pipe, for fittings along the free length a (see figure 2 and annex E).

Table 1: Diameters and wall thickness of pipes

Nominal diameter	Internal diameter		Wall thickness
DN	d_1 mm	Tolerances mm	e_{min} mm
50	50	± 2	6
60	60	± 2	6
70	70	± 2	6
80	80	± 2	6
100	100	± 2,5	6
125	125	± 3	7
150	150	± 4	7
200	200	± 5	7,5
250	250	± 6	8,5
300	300	± 7	9,5

5.6.2 Length of pipes

The nominal length l of a pipe is the complete length between the extremities (see figure 1).

The nominal length of pipes shall be: 2,0 m; 2,5 m; 3,0 m; 4 m; 5 m.

The tolerance on the length is $^{+\ 10}_{-\ 20}$ mm

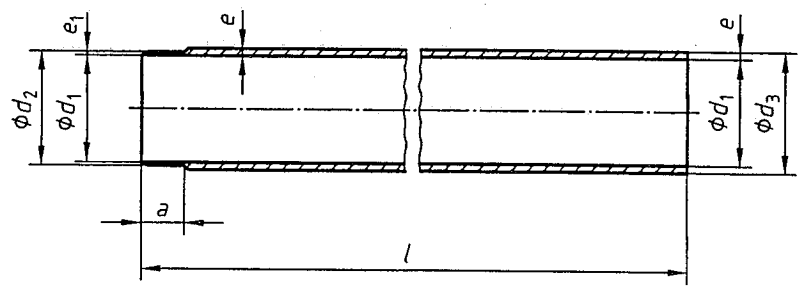

Figure 1: Pipes, shape of the pipe end and dimensions

5.6.3 Straightness of pipes

When measured in accordance with 6.3 the maximum tolerance *f* on straightness shall not exceed the values given in table 2.

Table 2: Tolerance on straightness

DN	Maximum deviation *f* mm
50 to 80 100 to 150 200 to 300	4,5 / 3,0 / 2,5 /
/is the total length of the pipe in metres (see figure 1).	

5.6.4 General design of fittings

5.6.4.1 Length of plain ends

For fittings the length of the plain ends shall be at least equal to the jointing length of the coupling.

5.6.4.2 Diameters and wall thickness

For fittings the internal diameters d_1 and the wall thickness shall be as given in table 1. Outside diameters and tolerances of plain ends shall be compatible with pipes and shall be stated by the manufacturer.

5.6.4.3 Angles for branches and bends

Preferred angles for bends and branches are those shown in table 3.

Table 3: Angles for bends and branches

for bends	for branches
15° 20° to 22° 30' 30° 45° 87° to 90°	45° 87° to 90°

5.6.4.4 Radius of bends

The minimum radius of bends is $r = 0{,}5$ DN except for bends of DN > 200 and angles > 70° where the minimum radius is $r = 0{,}7$ DN (see figure 2).

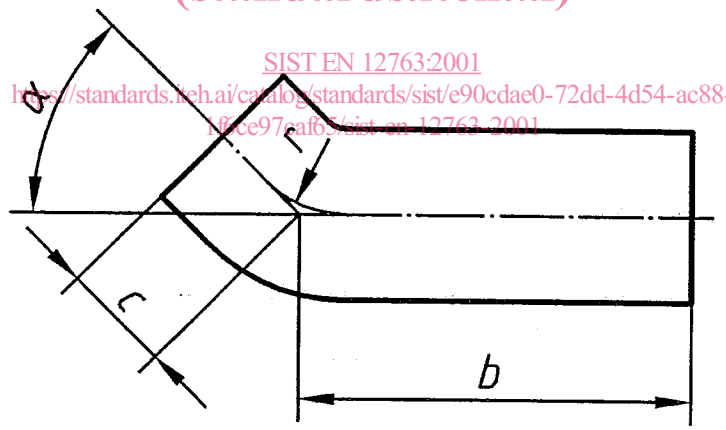

Figure 2: Bend (example)

5.6.5 Examples of fittings

Examples of fittings and their applications are shown in annex E. The manufacturer shall state in his literature the dimensions for his range of products.

5.7 Mechanical characteristics

5.7.1 Crushing strength

The crushing test shall be carried out on pipe sizes of DN 100 up to 300 in accordance with 6.4.1. The minimum crushing loads shall not be lower than those stated in table 4. The crushing strength is given by the crushing load G_L in kilonewtons per linear metre in accordance with 6.4.1.

Table 4: Minimum values for crushing loads

Nominal diameter DN	Crushing load G_L kN/m
100	15
125	15
150	15
200	15
250	15
300	18
NOTE: For pipes of DN 200 to DN 300 a lower crushing load of not less than 11 kN/m can be agreed between manufacturer and customer.	

5.7.2 Longitudinal bending

The test shall be carried out on pipes with a nominal diameter of DN ≤ 150. The minimum values for the longitudinal bending loads in accordance with 6.4.2 shall be as specified in table 5.

Table 5: Minimum values for longitudinal bending loads

Nominal diameter DN	Bending loads N min.
50	3 000
60	3 000
70	4 000
80	4 000
100	6 500
125	7 500
150	10 500

5.8 Physical characteristics

5.8.1 Watertightness

Pipes and fittings shall be watertight against an internal hydrostatic pressure of 50 kPa (0,5 bars).

When tested in accordance with 6.5.2, pipes and fittings shall exhibit no fissure, leakage or drops of water.

5.8.2 Frost resistance

Pipes and fittings shall be resistant to frost. During the test in accordance with 6.5.3 no visible changes which may affect the performance in use of the test specimen shall be allowed.

5.8.3 Warm water test

When tested in accordance with 6.5.4, the lower confidence limit L calculated for the test specimens shall be not less than 0,75.

5.8.4 Thermal stability

Pipe systems shall be tested for thermal stability. Following the test in accordance with 6.5.5 all parts of the pipe system shall be watertight and no part of the pipe system shall show either cracks, damage, deformations or other defects which could affect the performance in use.

This test is not necessary for rainwater pipes marked as such.

5.8.5 Resistance to domestic sewage media

When tested in accordance with 6.5.6, pipes shall not show any visible changes which may affect their performance in use. In the comparison with the test specimens (see 6.5.8) the lower confidence limit L shall be not less than 0,75.

This test is not necessary for rainwater pipes marked as such.

5.8.6 Resistance to SO_2

When tested in accordance with 6.5.7, a comparison with the initial test specimens is to be made (see 6.5.8). The lower confidence limit L shall be not less than 0,75.

This test is not necessary for rainwater pipes marked as such.

5.9 Internal coating

When tested in accordance with 6.6, the coating shall not show any changes which may affect its performance in use.

5.10 Bonding stability of adhesive connections

When tested in accordance with 6.7, fittings with adhesive connections shall be watertight as specified in 5.8.1 and shall not exhibit any changes which may affect their performance in use.

6 Test methods for pipes and fittings

6.1 General

6.1.1 Acceptance tests

Acceptance tests shall be carried out at the manufacturers works on pipes and fittings as delivered whenever possible, or on test specimens cut from the pipes.

NOTE The manufacturer can carry out the test as part of the routine quality control system at an earlier stage of maturity.