



SLOVENSKI STANDARD

SIST ISO 4435:1995

01-november-1995

Cevi in fittingi iz nemehčane polivinilklorida (PVC - U) za zakopane drenažne in kanalizacijske sisteme - Specifikacije

Unplasticized poly(vinyl chloride) (PVC-U) pipes and fittings for buried drainage and sewerage systems -- Specifications

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Tubes et raccords en poly(chlorure de vinyle) non plastifié (PVC-U) pour les systèmes d'assainissement enterrés et les égouts souterrains -- Spécifications

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Ta slovenski standard je istoveten z: **ISO 4435:1991**

ICS:

23.040.20	Cevi iz polimernih materialov	Plastics pipes
91.140.80	Drenažni sistemi	Drainage systems
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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en

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INTERNATIONAL STANDARD

**ISO
4435**

First edition
1991-05-15

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*(Tubes et raccords en poly(chlorure de vinyle) non plastifié (PVC-U) pour
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Reference number
ISO 4435:1991(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75% of the member bodies casting a vote.

International Standard ISO 4435 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*.

Annex A of this International Standard is for information only.

<https://standards.iteh.ai/catalog/standards/sist/b02a7b77-2a27-49df-a8e0-fe1fdcc88bce/sist-iso-4435-1995>

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International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Unplasticized poly(vinyl chloride) (PVC-U) pipes and fittings for buried drainage and sewerage systems — Specifications

1 Scope

This International Standard specifies unplasticized poly(vinyl chloride) (PVC-U) pipes and fittings with elastomeric sealing ring joints for outside diameters from 110 mm to 630 mm and with cemented-type joints for outside diameters from 110 mm to 200 mm, intended for buried gravity drain and sewer pipes for the transportation of soil and waste discharge of domestic and industrial origin and surface water.

In the case of industrial discharge, chemical and temperature resistance have to be taken into account.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 265-1:1988, *Pipes and fittings of plastics materials — Fittings for domestic and industrial waste pipes — Basic dimensions: Metric series — Part 1: Unplasticized poly(vinyl chloride) (PVC-U)*.

ISO 580:1990, *Injection-moulded unplasticized poly(vinyl chloride) (PVC-U) fittings — Oven test — Test method and basic specifications*.

ISO 1043-1:1987, *Plastics — Symbols — Part 1: Basic polymers and their special characteristics*.

ISO 1167:—¹⁾, *Thermoplastics pipes for the transport of fluids — Resistance to internal pressure — Test method and basic specification*.

ISO 2505:1981, *Unplasticized polyvinyl chloride (PVC) pipes — Longitudinal reversion — Test methods and specification*.

ISO 2507:1982, *Unplasticized polyvinyl chloride (PVC) pipes and fittings — Vicat softening temperature — Test method and specification*.

ISO 3126:1974, *Plastics pipes — Measurement of dimensions*.

ISO 3127:1980, *Unplasticized polyvinyl chloride (PVC) pipes for the transport of fluids — Determination and specification of resistance to external blows*.

ISO 3606:1976, *Unplasticized polyvinyl chloride (PVC) pipes — Tolerances on outside diameters and wall thicknesses*.

ISO 4065:1978, *Thermoplastic pipes — Universal wall thickness table*.

ISO 4633:1983, *Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials*.

1) To be published. (Revision of ISO 1167:1973)

3 Symbols

The main symbols used in this International Standard are listed in table 1.

Table 1 — Symbols

Symbol	Definition
D	Nominal outside diameter of pipe
$D_{e,m}$	Mean outside diameter
d_s	Socket inside diameter
e	Nominal wall thickness
e_2	Wall thickness at socket cylindrical part
e_3	Wall thickness at socket groove
l_1	Spigot length
l_2	Socket depth
l	Nominal length of pipe
	} length of engagement

NOTE 1 The meanings of symbols A , B , C and H are illustrated in the respective figures.

4 Material

4.1 The material shall consist substantially of poly(vinyl chloride) (PVC) to which may be added only those additives that are needed to facilitate the manufacture of sound, durable pipes and fittings of good surface finish, mechanical strength and opacity.

When sealing rings are retained by means of retaining caps or rings, the retaining caps or rings may be made from polymers other than PVC-U provided that they conform to the same functional dimensions and test requirements as applied to sockets with either loose or fixed sealing rings.

4.2 The use of the manufacturer's own clean rework material conforming to the requirements given in 4.1 is permissible. No other rework material shall be used.

5 Geometrical characteristics

NOTE 2 The figures are schematic sketches only, to help demonstrate relevant dimensions. They do not necessarily represent manufactured components.

All measurements of dimensions shall be carried out in accordance with ISO 3126.

5.1 Pipe dimensions

The pipe dimensions are illustrated in figure 1.

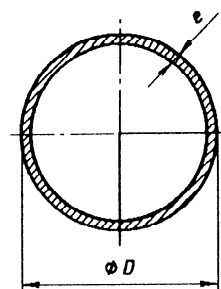


Figure 1 — Dimensions

5.1.1 Outside diameter

The nominal outside diameter D shall be in accordance with table 2 and figure 1.

Table 2 — Nominal outside diameter

Dimensions in millimetres

110	125	160	200	250	315	400	500	630
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NOTE 3 Table 2 will be extended to include diameters up to 1000 mm when the relevant information has been presented and accepted.

Tolerances on outside diameters shall be those given in ISO 3606.

5.1.2 Wall thickness

The nominal wall thickness e shall be in accordance with table 3 and figure 1. The choice of a size range is left to the national standards bodies.

Tolerances on wall thickness shall be those in ISO 3606.

Table 3 — Nominal wall thickness

Dimensions in millimetres

Nominal outside diameter <i>D</i>	Nominal wall thickness, <i>e</i>		
	Reference stiffness, kN/m ² 1)		
	2	4	8
	Pipe series 2)		
	S25	S20	S16,7 ³⁾
110	—	3	3,2
125	3	3,1	3,7
160	3,2	4	4,7
200	3,9	4,9	5,9
250	4,9	6,2	7,3
315	6,2	7,7	9,2
400	7,8	9,8	11,7
500	9,8	12,3	14,6
630	12,3	15,4	18,4

1) The reference stiffness values are given as a guide, and may be determined by the method given in ISO 9969.

2) The number of the wall thickness range generally follows the pipe series (S) used in ISO 4065 except that the minimum wall thickness is 3 mm.

3) Deviates from ISO 4065 for technical reasons.

5.1.3 Length of pipe

The nominal length of pipes with sockets is considered to be the distance between the ends minus the socket depth (see figure 2).

The lengths may be supplied as agreed between purchaser, user and manufacturer.

5.1.4 Integral pipe sockets and spigot ends

The basic dimensions shall be in accordance with table 4 and table 5 and figure 3, figure 4, figure 5 and figure 6, with $e_{2, \min} = 0,9e$ and $e_{3, \min} = 0,75e$.

$e_{3, \min}$ applies only to those parts of the ring seal zone where the fluid contained within the pipe comes into contact with the socket. For those parts of the socket which do not come into contact with the fluid, i.e. beyond the designated ring seal point, walls thinner than e_3 are permitted.

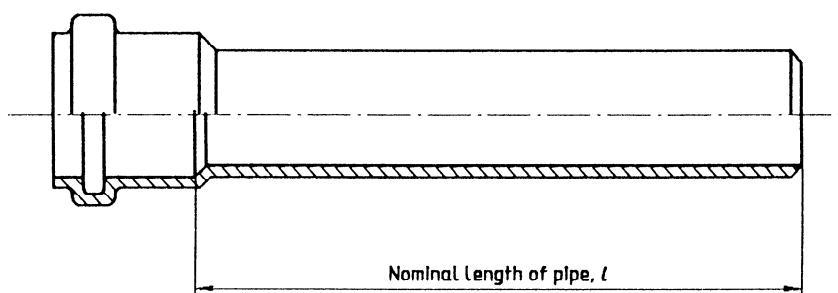


Figure 2 — Length of pipe

Table 4 — Single sockets and spigot ends for elastomeric sealing ring joints

Dimensions in millimetres

Nominal outside diameter <i>D</i>	Socket				Spigot end	
	<i>d_s</i> min.	<i>A</i> min.	<i>B</i> min.	<i>C</i> max.	<i>l₁</i> min.	<i>H</i> ≈
110	110,4	32	6	22	54	6
125	125,4	35	7	26	61	6
160	160,5	42	9	32	74	7
200	200,6	50	12	40	90	9
250	250,8	55	18	70	125	9
315	316	62	20	70	132	12
400	401,2	70	24	70	140	15
500	501,5	80	28	80	160	18
630	631,9	93	34	95	188	23

The performance of a joint made between a single socket and a pipe spigot shall be determined as specified in 9.1.2.4 (angular deflection test) and/or 9.1.2.5 (combined test).

A_{\min} for $D \leq 200$ mm shall be $0,2 D + 10$ mm.

A_{\min} for $D \geq 250$ mm shall be $0,1 D + 30$ mm.

The A_{\min} values have been chosen mainly on the basis of experience with pipes of 5 m length.

The B values may be smaller for constructions with sealing rings firmly fixed in the groove of the socket.

$$l_{1, \min} = C_{\max} + A_{\min}$$

Where sealing rings are firmly fixed and have multiple sealing zones, the dimensions A_{\min} and C_{\max} should be measured to the effective sealing point as specified by the manufacturer (see figure 5).

C_{\max} should then be checked with a gauge as this dimension determines the tightness of the joint.

Retaining caps or rings may be made to other designs and from polymers other than unplasticized poly(vinyl chloride) provided that the finished joint conforms to the same functional test requirements.

Where a sealing ring is retained by means of a retaining cap or ring, the wall thickness in this area shall be calculated by the addition of the wall thicknesses of the corresponding places of the socket and the retaining cap or ring (see figure 4 for an example). In all cases the components shall meet the functional test requirements.

Table 5 — Sockets and spigot ends for cemented-type joints

Dimensions in millimetres

Nominal outside diameter <i>D</i>	Socket				<i>l₂</i> min.	Spigot end	
	X series socket ¹⁾		Y series socket ¹⁾			<i>l₁</i> min.	<i>H</i> ≈
	<i>d_s</i> min.	<i>d_s</i> max.	<i>d_s</i> min.	<i>d_s</i> max.			
110	110,2	110,6	110,4	110,8	48	54	6
125	125,2	125,7	125,4	125,9	51	61	6
160	160,2	160,7	160,5	161,0	58	74	7
200	200,2	200,8	200,6	201,1	66	90	9

1) To form the subject of a future International Standard.

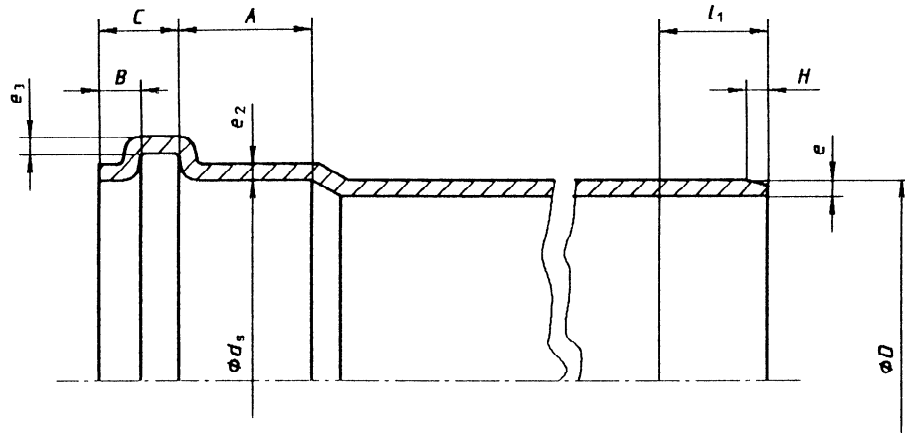


Figure 3 — Basic dimensions of single sockets and spigot ends for elastomeric sealing ring joints

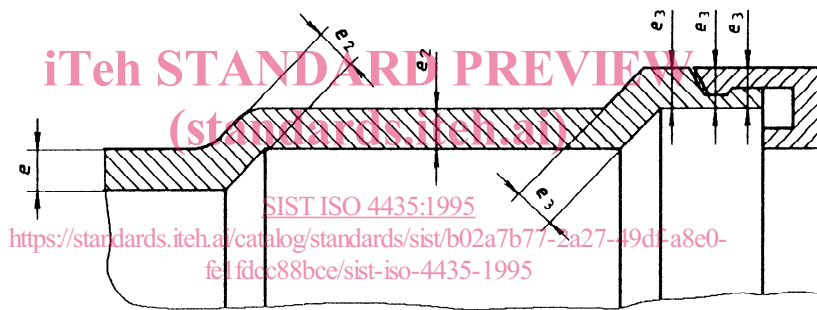


Figure 4 — Example of a seal retaining cap

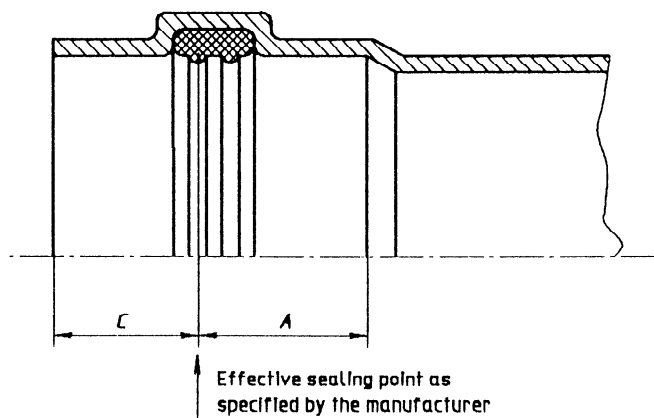


Figure 5 — Effective sealing point