SLOVENSKI STANDARD
oSIST prEN 1401-1:2026

01-julij-2026

Cevni sistemi iz polimernih materialov za odpadno vodo in kanalizacijo, ki delujejo po težnostnem principu in so položeni v zemljo - Nemehčani polivinilklorid (PVC-U) - 1. del: Specifikacije za cevi, fitinge in sisteme

Plastics piping systems for non-pressure underground drains and sewers - Unplasticized poly(vinyl chloride) (PVC-U) - Part 1: Specifications for pipes, fittings and the systems

Kunststoff-Rohrleitungssysteme für erdverlegte drucklose Abwasserkanäle und -leitungen - Weichmacherfreies Polyvinylchlorid (PVC-U) - Teil 1: Anforderungen an Rohre, Formstücke und das Rohrleitungssystem

Systèmes de canalisations en plastique pour les branchements et les collecteurs d'assainissement enterrés sans pression - Poly(chlorure de vinyle) non plastifié (PVC-U) - Partie 1 : Spécifications pour tubes, raccords et le système

Ta slovenski standard je istoveten z: **prEN 1401-1**

ICS:

23.040.05	Cevovodi za zunanje sisteme za odpadno vodo in njihovi deli	Pipeline and its parts for external sewage systems
91.140.80	Drenažni sistemi	Drainage systems
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

oSIST prEN 1401-1:2026 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 1401-1

April 2026

ICS 23.040.01

Will supersede EN 1401-1:2019+A1:2023

English Version

Plastics piping systems for non-pressure underground drains and sewers - Unplasticized poly(vinyl chloride) (PVC-U) - Part 1: Specifications for pipes, fittings and the systems

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 155.

If this draft becomes a European Standard, 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.

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

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Ref. No. prEN 1401-1:2026 E

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European foreword

This document (prEN 1401-1:2026) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

This document is currently submitted to CEN Enquiry.

This document will supersede EN 1401-1:2019+A1:2023.

This revision of the EN 1401 series is proposed by CEN/TC155/WG13 members in order to improve the “level of sustainability” and the “environmental impact” of PVC piping systems, whilst improving the recommendations and safe use of recycled material.

prEN 1401-1:2026 includes the following significant technical changes with respect to EN 1401-1:2019+A1:2023:

a) clarified of products covered (Clause 1);

b) updated normative references;

c) updated definitions (3.1 General definitions, 3.2 Geometrical definitions, 3.3 Mechanical definitions, 3.4 Material definitions) and symbols;

d) updated material clause (5.1 general) and deleted sub Clause 5.6 Utilization of non-virgin material);

e) updated general characteristics (sub Clause 6.1 Appearance);

f) updated geometrical characteristics (for pipes 7.2.5 Wall thickness and for fittings, 7.3.3 Wall thickness, 7.3.2 Design lengths (Z)), 7.4.1 Elastomeric ring seal sockets and spigots, 7.4.2 Adhesive joint sockets and spigots and 7.5 Types of fittings including new drawings for Figures 9, 10 and 11;

g) updated mechanical characteristics sub Clause 8.1.2 Optional and Table 12, sub Clause 8.2.2 Additional requirements and Table 13;

h) updated physical characteristics on Tables 14 and 15;

i) updated performance requirements on Table 16;

j) adhesives, clarified that the adhesive for jointing of PVC-U shall be solvent cement and shall be as specified by the manufacturer;

k) updated marking;

l) completed review of Annex A concerning the use of recyclates *(aligned with FprEN 1329-1:2025)*;

m) updated Annex B – general material characteristics for material;

n) updated Annex C.

This document is a System Standard for plastics piping systems of a particular material for a specified application. There are a number of such System Standards, see Annex C.

System Standards are based on the results of the work undertaken in ISO/TC 138 “Plastics pipes, fittings and valves for the transport of fluids”, which is a Technical Committee of the International Organization for Standardization (ISO).

System Standards are supported by separate standards on test methods to which references are made throughout the System Standard.

System Standards are consistent with general standards on functional requirements and on recommended practice for installation.

prEN 1401:2025 consists of the following parts, under the general title *Plastics piping systems for non-pressure underground drains and sewers — Unplasticized poly(vinyl chloride) (PVC-U)*:

— *Part 1: Specifications for pipes, fittings and the system* (this document);

— *Part 2: Assessment of conformity (CEN/TS)*.

For guidance for installation, see CEN/TS 1046, and for guidance for design, see CEN/TS 15223:2025[15].

1 Scope

This document specifies the definitions and requirements for solid wall pipes with smooth internal and external surfaces, extruded from the same formulation throughout the wall, fittings and the system of unplasticized poly(vinyl chloride) (PVC-U) piping systems in the field of non-pressure underground drains and sewers for wastewater.

NOTE 1 Products complying with this document can also be used in non-pressure underground drains and sewers for surface water.

This document also specifies test methods and test parameters.

This document is applicable to:

— solid wall pipes and fittings which are intended to be used buried underground outside the building structure reflected in the marking of the products by “U”, and

— solid wall pipes and fittings which are intended to be used buried underground both outside (application area code “U”) and within the building structure reflecting on the marking of products by “UD”.

NOTE 2 Multilayer pipes with different formulations throughout the wall and foamed core pipes are covered by EN 13476-2 [1].

This document covers a range of pipe and fitting sizes, stiffness classes, and gives recommendations concerning colours.

NOTE 3 It is the responsibility of the purchaser or specifier to make the appropriate selection from these aspects, taking into account their particular requirements and any relevant national regulations and installation practices or codes.

In conjunction with CEN/TS 1401-2 [7] it is applicable to PVC-U pipes and fittings, their joints and to joints with components of other plastics and non-plastics materials intended for buried piping systems for non-pressure underground drains and sewers.

NOTE 4 Pipes, fittings and other components conforming to any of the plastics product standards listed in Annex C can be used with pipes and fittings conforming to this document, provided they conform to the requirements for joint dimensions given in Clause 10 and to the requirements of Table 16.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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

EN 681-2, *Elastomeric Seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 2: Thermoplastic elastomers*

EN 14680, *Adhesives for non-pressure thermoplastics piping systems - Specifications*

EN 15346:2024, *Plastics — Recycled plastics — Characterization of poly(vinyl chloride) (PVC) recyclates*

EN ISO 472:2013, *Plastics - Vocabulary (ISO 472:2013)*

EN ISO 527-2, *Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2)*

EN ISO 580, *Plastics piping and ducting systems - Injection-moulded thermoplastics fittings - Methods for visually assessing the effects of heating (ISO 580)*

EN ISO 1043-1:2011, *Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics (ISO 1043-1:2011)*

EN ISO 1158, *Plastics - Vinyl chloride homopolymers and copolymers - Determination of chlorine content (ISO 1158)*

EN ISO 1167-1:2006, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 1: General method (ISO 1167-1:2006)*

EN ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 2: Preparation of pipe test pieces (ISO 1167-2)*

EN ISO 1183-1, *Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1)*

EN ISO 2505, *Thermoplastics pipes - Longitudinal reversion - Test method and parameters (ISO 2505)*

prEN ISO 2507:2025, *Thermoplastics pipes and fittings — Vicat softening temperature: General test method and test conditions for Vinyl chloride - based (PVC-U, PVC-C, PVC-Hi) and Acryl nitrile - based (ABS, ASA) pipes and fittings (ISO/DIS 2507:2025)EN ISO 3126, Plastics piping systems — Plastics components — Determination of dimensions (ISO 3126)*

EN ISO 3127, *Thermoplastics pipes - Determination of resistance to external blows - Round-the-clock method (ISO 3127)*

EN ISO 3451-5, *Plastics - Determination of ash - Part 5: Poly(vinyl chloride) (ISO 3451-5)*

EN ISO 6259-1, *Thermoplastics pipes - Determination of tensile properties - Part 1: General test method (ISO 6259-1)*

EN ISO 6259-2, *Thermoplastics pipes - Determination of tensile properties - Part 2: Pipes made of unplasticized poly(vinyl chloride) (PVC-U), oriented unplasticized poly(vinyl chloride (PVC-O), chlorinated poly (vinyl chloride) (PVC-C) and high-impact poly (vinyl chloride) (PVC-HI) (ISO 6259-2)*

EN ISO 9852, *Unplasticized poly(vinyl chloride) (PVC-U) pipes - Dichloromethane resistance at specified temperature (DCMT) - Test method (ISO 9852)*

EN ISO 9969, *Thermoplastics pipes - Determination of ring stiffness (ISO 9969)*

EN ISO 11173, *Thermoplastics pipes - Determination of resistance to external blows - Staircase method (ISO 11173)*

EN ISO 13254, *Thermoplastics piping systems for non-pressure applications - Test method for watertightness (ISO 13254)*

EN ISO 13257:2018, *Thermoplastics piping systems for non-pressure applications - Test method for resistance to elevated temperature cycling (ISO 13257:2018)*

EN ISO 13259, *Thermoplastics piping systems for underground non-pressure applications - Test method for leaktightness of elastomeric sealing ring type joints (ISO 13259)*

EN ISO 13263, *Thermoplastics piping systems for non-pressure underground drainage and sewerage - Thermoplastics fittings - Test method for impact strength (ISO 13263)*

EN ISO 13264, *Thermoplastics piping systems for non-pressure underground drainage and sewerage - Thermoplastics fittings - Test method for mechanical strength or flexibility of fabricated fittings (ISO 13264)*

ISO 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

ISO 18373-1, *Rigid PVC pipes — Differential scanning calorimetry (DSC) method — Part 1: Measurement of the processing temperature*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 472:2013 and EN ISO 1043-1:2011 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1 General definitions

3.1.1
application area code
code used in the marking of pipes and fittings to indicate the application area(s) for which they are intended, as follows:

— U: for the area more than 1 m from the building to which the buried piping system is connected;

— UD: for application area U and the area under and within 1 m from the building where the pipes and the fittings are buried in ground and are connected to the soil and waste discharge system of the building

3.1.2
solid wall pipe and fitting
pipe or fitting with smooth internal and external surface with the same formulation through the wall

Note 1 to entry: Pipes having more than one layer are considered as solid wall pipes, provided they are all made from the same formulation

3.1.3
fabricated fitting
fitting produced by welding, thermoforming or adhesive joint from pipes and/or from injection-moulded fittings

3.1.4
drain
pipeline, usually underground, designed to carry wastewater from a source to a sewer

[SOURCE: EN 16323:2014, 2.2.3.1]

3.1.5
sewer
pipeline or other construction, usually underground, design to carry wastewater from more than one source

[SOURCE: EN 16323:2014, 2.2.3.12]

3.1.6
wastewater
water composed of any combination of water discharged from domestic, industrial or commercial premises, surface run-off and accidentally any sewer infiltration water

[SOURCE: EN 16323:2014, 2.3.10.65, modified – sewage (deprecated) deleted]

3.1.7
surface water
water from precipitation, which has not seeped into the ground and is discharged to the drain or sewer system directly from the ground or from exterior building surfaces

[SOURCE: EN 16323:2014, 2.1.1.3]

3.2 Geometrical definitions

3.2.1
nominal size
DN
numerical designation of the size of a component, which is a convenient round number approximately equal to the manufacturing dimension

Note 1 to entry: Nominal size is expressed in millimetres (mm).

Note 2 to entry: This designation is not used for threaded components.

3.2.2
nominal size
DN/OD
nominal size, related to the outside diameter

3.2.3
nominal diameter
d_n
specified diameter, assigned to a nominal size

Note to entry: It is expressed in millimetres (mm)

3.2.4
outside diameter
d_e
value of the measurement of the outside diameter through its cross-section at any point of a pipe or spigot end, rounded up to the nearest 0,1 mm

3.2.5
mean outside diameter
d_{em}
value of the measurement of the outer circumference of a pipe or spigot end of a fitting in any cross section, divided by π (≈ 3,142), rounded to the nearest 0,1 mm

3.2.6
mean inside diameter of a socket
d_{sm}
arithmetical mean of a number of measurements of the inside diameter of a socket in the same cross-section

3.2.7
out-of-roundness, ovality
difference between the measured maximum and the measured minimum outside diameter in the same cross section of a component

3.2.8
nominal wall thickness
e_n
numerical designation of the wall thickness of a component which is identical to the minimum permissible wall thickness at any point

3.2.9
wall thickness
e
value of measurement of the wall thickness at any point around the circumference of a component

3.2.10
mean wall thickness
e_m
arithmetical mean of a number of measurements of the wall thickness, regularly spaced around the circumference and in the same cross section of a component, including the measured minimum and the measured maximum values of the wall thickness in that cross section

3.2.11
standard dimension ratio
SDR
numerical designation of a pipe series, which is a convenient round number, approximately equal to the dimension ratio of the nominal outside diameter, d_n, and the nominal wall thickness, e_n

3.3 Mechanical definitions

3.3.1
pipe stiffness
mechanical characteristic of a pipe, which is a measure of the resistance to diametric (ring) deflection under an external force as determined in accordance with EN ISO 9969

3.3.2
fitting stiffness
mechanical characteristic of a fitting which is a measure of the resistance to diametric (ring) deflection under an external force as determined in accordance with EN ISO 13967 [8]