SLOVENSKI STANDARD
SIST EN 1329-1:2026

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Cevni sistemi iz polimernih materialov za nizko- in visokotemperaturne odvodne sisteme v zgradbah - Nemehčan polivinilklorid (PVC-U) - 1. del: Zahteve za cevi, fitinge in sistem

Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Unplasticized poly(vinyl chloride) (PVC-U) - Part 1: Specifications for pipes, fittings and the system

Kunststoff-Rohrleitungssysteme zum Ableiten von Abwasser (niedriger und hoher Temperatur) innerhalb der Gebäudestruktur - Weichmacherfreies Polyvinylchlorid (PVC-U) - Teil 1: Anforderungen an Rohre, Formstücke und das Rohrleitungssystem

Systèmes de canalisations en plastique pour l'évacuation des eaux-vannes et des eaux usées (à basse et à haute température) à l'intérieur de la structure des bâtiments - Poly (chlorure de vinyle) non plastifié (PVC-U) - Partie 1 : Spécifications pour tubes, raccords et le système

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Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Unplasticized poly(vinyl chloride) (PVC-U) - Part 1: Specifications for pipes, fittings and the system

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This European Standard was approved by CEN on 27 March 2026.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents

Page

European foreword

This document (EN 1329-1:2026) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

This 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of an identical text or by endorsement, at the latest by November 2026, and conflicting national standards shall be withdrawn at the latest by November 2026.

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

This document supersedes EN 1329-1:2020.

EN 1329-1:2026 includes the following significant technical changes with respect to EN 1329-1:2020:

— allowance of the use of recyclates up to 100 %;

— updating of the “terms” and “definitions” in line with EN 14541-1;

— extension to PVC-U material sources which may be virgin material, reworked material or recyclates (pre- or post-consumer);

— editorial updates through the document;

— in 5.1, clarification that the conformity with all the requirements shall be demonstrated with one formulation with the 100 % virgin material and a second formulation with the maximum content of recyclate;

— in 9.1 and 9.2, introduction of an annealing prior to determining the Vicat softening temperature (VST) to bring it in line with the annealing happening during the elevated temperature cycling test and in service operations; this change also reduce the variability in Vicat measurement which occurs without annealing;

— in Annex A, addition of detailed information about the use of PVC-U recyclates.

EN 1329 consists of the following parts, under the general title *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Unplasticized poly(vinyl chloride) (PVC-U)*:

— *Part 1: Specifications for pipes, fittings and the system*;

— *Part 2: Assessment of conformity (technical specification)*.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

1 Scope

This document specifies the requirements for solid wall pipes with smooth internal and external surfaces, extruded from the same formulation throughout the wall, fittings and the piping system of unplasticized poly(vinyl chloride) (PVC-U) intended for soil and waste discharge applications (low and high temperature)

— above ground inside the building, or outside buildings fixed onto the wall; which is reflected in the marking by “B”;

— for both inside buildings and buried in ground within the building structure, which is reflected in the marking by “BD”. This intended use is only applicable for components with nominal outside diameters equal to or greater than 75 mm.

NOTE 1 Multilayer pipes with different formulations throughout the wall and foamed core pipes are covered by EN 1453-1[1].

PVC-U pipes, fittings and the system complying with this document are also suitable for the following purposes:

— ventilating part of the pipework in association with discharge applications;

— rainwater pipework within the building structure.

This document covers a range of nominal sizes, a range of pipes and fittings series and gives recommendations concerning colours.

Pipes, fittings and other components conforming to any of the plastics product standards listed in Annex B can be used with pipes and fittings conforming to this document, provided they conform to the requirements for joint dimensions given in Clause 7 and to the requirements of Table 26.

NOTE 2 EN 476[2] specifies the general requirements for components used in discharge pipes, drains and sewers for gravity systems. Pipes and fittings conforming to EN 1329-1 fully meet the EN 476 requirements.

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 — Material 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 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 16000, *Plastics piping systems — Systems within the building structure — Mounting and fixing of components in the test apparatus to thermal attack by a single burning item*

EN ISO 472, *Plastics — Vocabulary (ISO 472)*

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

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 1167-2:2006, *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 1167-2:2006)*

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

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

EN ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)*

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

EN ISO 13255, *Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for airtightness of joints (ISO 13255)*

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

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 2507:2026, *Thermoplastics pipes and fittings — Vicat softening temperature — General test method and test conditions for vinyl chloride-based (PVC-U, PVC-C, PVC-HI) and acrylonitrile-based (ABS, ASA) pipes and fittings*

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 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 and EN ISO 1043-1 and the following apply.

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

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

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

3.1
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:

— B: for components intended for use above ground inside the building, or for components outside buildings fixed onto the wall;

— BD: for application area B and the area under and within 1 m from the building where the pipes and fittings are buried in ground and are connected to the underground drains and sewers system

Note 1 to entry: Other application area codes U and UD not covered by this document are defined elsewhere, e.g. in EN 1401-1.

3.2 Nominal size

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

3.3
nominal outside diameter
d_n
specified outside diameter assigned to a nominal size DN/OD

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

3.4
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

3.5
mean outside diameter
d_{em}
value of the measurement of the outer circumference of a pipe or spigot of a fitting in any cross section, divided by π (≈ 3,142), rounded up to the nearest 0,1 mm

3.6
inside diameter of a socket
d_s
value of the measurement of the inside diameter through its cross section at any point of a socket, rounded up to the nearest 0,1 mm

3.7
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

3.8
out-of-roundness
ovality
difference between the measured maximum and the measured minimum outside diameter in the same cross section of a component

3.9
wall thickness
e
value of measurement of the wall thickness at any point around the circumference of a component

3.10
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

3.11
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

3.12
nominal ring stiffness class
SN
numerical designation of the ring stiffness of the pipe or fitting which is a convenient round number, indicating the minimum required ring stiffness of the pipe or stiffness of the fitting

3.13
assembled fittings
fittings which are made from several injection moulded parts to be assembled together by screwing or clipping

Note 1 to entry: Such fittings can incorporate rubber membranes or joints.

3.14
fabricated fittings
fitting produced by welding, thermoforming or adhesive joint from pipes and/or from injection-moulded fittings

3.15
solid wall pipe or fitting
pipe or fitting with smooth internal and external surface with the same compound/formulation throughout the wall

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

3.16
virgin material
plastics material in the form of pellets, granules, powder, floc, etc. that has not been subjected to use or processing other than that required for its initial manufacture

Note 1 to entry: Does not contain any reworked plastics material and/or plastics recyclate.

Note 2 to entry: Sometimes also referred to as “primary material” or “primary plastics feedstock”.

Note 3 to entry: It is understood that the addition of additives such as stabilizers and pigments is still resulting into a virgin (plastics) material.

[SOURCE: EN 14541-1:2022, 3.1]

3.17
reworked material
plastics material from rejected unused products or trimmings capable of being reclaimed within the same process that generated it

Note 1 to entry: Reworked material does not change the status of the feedstock.

Note 2 to entry: This definition does not cover the conditions for the use of reworked material, which can be found in the applicable product standard.

Note 3 to entry: Previously referred to as “own reprocessed material”.

[SOURCE: EN 14541-1:2022, 3.2]

3.18
pre-consumer material
plastics material diverted from the waste stream during a manufacturing process, excluding reworked (plastics) material

Note 1 to entry: Previously referred to as “post-industrial material”.

Note 2 to entry: Different categories of pre-consumer material may be considered in the applicable product standard.

[SOURCE: EN 14541-1:2022, 3.3]

3.19
post-consumer material
plastics material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose

Note 1 to entry: This includes returns of material from the distribution chain.

Note 2 to entry: Different categories of post-consumer material may be considered in the applicable product standard.

[SOURCE: EN 14541-1:2022, 3.4]

3.20
recyclate
plastics material resulting from the recycling of pre-consumer and post-consumer plastics products

Note 1 to entry: Also referred to as “secondary raw material” or “recycled plastics” or “regenerate”.

Note 2 to entry: Recycling can be chemical, physical or mechanical.

[SOURCE: EN 14541-1:2022, 3.5]

3.21
agreed specification
specification of the relevant material characteristics agreed between the supplier of the recyclate and the pipes and/or fittings manufacturer

Note 1 to entry: The agreed specification is often considered in the context of certification by a third party organization.

[SOURCE: EN 14541-1:2022, 3.15]

4 Symbols and abbreviations

4.1 Symbols

For the purposes of this document, the following symbols apply.

A	length of engagement
α	nominal angle of fitting
C	depth of sealing zone
d_e	outside diameter
d_{em}	mean outside diameter
d_s	inside diameter of socket
e	wall thickness
e_{min}	minimum wall thickness
e_2	wall thickness of socket
e_3	wall thickness at the groove
L_1	length of spigot
L_2	length of adhesive joint socket
l	effective length of pipe
R	radius of swept fittings
X	stop width
Z	design length of fitting

4.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

DN	nominal size
DN/OD	nominal size, outside diameter related
DSC	differential scanning calorimetry
PVC-U	unplasticised poly(vinyl chloride)
SDR	standard dimension ratio
SN	nominal ring stiffness class
TIR	true impact rate
Type L	long socket type for ring seal joints
Type M	medium socket type for ring seal joints
Type S	short socket type for ring seal joints
VST	Vicat softening temperature
RAL	colour reference system

5 Material

5.1 General

The formulation for production of pipes and fittings shall be PVC-U material to which additives are added to enable conformity with the requirements of this document.

The dosage level of each ingredient of the formulation shall be specified by the manufacturer as part of the quality documentation.

Conformity of the product (pipes, fittings or the system as applicable) with all the requirements of this document shall be demonstrated.

PVC-U material may be virgin material, reworked material or recyclates (pre- or post-consumer).

The formulation (including virgin material, reworked material, recyclates or a mixture, if applicable) shall comply with the requirements given in 5.2.

Recyclates may be used under the following conditions:

— recyclates shall be supplied with an agreed specification in accordance with Annex A;

— for each agreed specification, the minimum and maximum amounts of recyclate in the formulation shall be specified by the manufacturer and the conformity with all the requirements of this document shall be demonstrated by testing the product:

  — with no or minimum recyclate content, and

  — with maximum recyclate content;

NOTE 1 Formulations with recyclate content between minimum and maximum are deemed to comply as well.

NOTE 2 Recyclates from different suppliers complying with the same agreed specification are deemed to be interchangeable.

— the quantity of recyclates that is added in each production batch shall be recorded by the manufacturer.

NOTE 3 The total recyclate content in the formulation is the sum of the recyclate added and the recyclate present in reworked material.

NOTE 4 CEN/TS 1329-2[4] gives specific recommendation with regard to test frequency when recyclate is used.

5.2 Formulation characteristics of pipe and fitting

The formulation shall comply with the requirements given in Table 1 and, if applicable in 5.3.1 and 5.3.2 for pipes and 5.3.3 for fittings.

Table 1 — Minimum PVC-U content

Characteristics	Requirements	Test method
PVC-U content for pipes	≥ 80 % by mass	Calculation or EN ISO 1158[a] or EN ISO 3451-5, Method A[b]
PVC-U content for injection-moulded fittings	≥ 85 % by mass	

[a] The PVC-U content is equal to $(m_{cl}/56{,}8) \times 100$, where m_{cl} is the chlorine content expressed as a percentage by mass in accordance with EN ISO 1158.

[b] The measurement of filler content by ash rest is an alternative to the measurement of PVC-U content. This measurement should be conducted at 950°C. In case of dispute, EN ISO 1158 applies.

5.3 Material for BD application

5.3.1 Use of mineral modifier

For pipes ≥ 110 mm and intended for BD application, a further reduction of the PVC-U content to ≥ 75 % by mass is permitted provided the PVC-U is substituted by coated or uncoated $CaCO_3$ conforming to the following:

a) the composition of the $CaCO_3$, before coating if any, shall conform to the following:

   1) content of $CaCO_3$ ≥ 96 % by mass;

   2) content of $MgCO_3$ ≤ 4 % by mass;

   3) content of $CaCO_3$ and $MgCO_3$ in total ≥ 98 % by mass;

b) the physical properties of the material shall conform to the following:

   1) mean particle size D50 ≤ 2,5 µm;

   2) top cut D98 ≤ 20 µm.

5.3.2 Additional requirements for pipes material for BD application

The material of pipes intended to be used in application area BD shall comply with the additional requirement given in Table 2, when tested in accordance with the test method as specified in Table 2, using the indicated parameters.

The pipe formulation shall be tested in the form of a pipe.