

Plastics rainwater piping systems for above ground external use — Unplasticized poly(vinyl chloride) (PVC-U) —

Part 1: Specifications for pipes, fittings and the system

The European Standard EN 12200-1:2000 has the status of a
British Standard

ICS 23.040.01; 91.060.20

National foreword

This British Standard is the official English language version of EN 12200-1:2000. It is one of a group of EN standards which each partially supersedes BS 4576-1:1989, the others being BS EN 607:1996 and BS EN 1462:1997. BS 4576-1:1989 will be withdrawn on 2002-09-31.

The UK participation in its preparation was entrusted by Technical Committee PRI/88, Plastics piping systems and components (previously PRI/61), to Subcommittee PRI/88/1, Thermoplastics piping systems for non-pressure applications (previously PRI/61/1), which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

The responsible UK committee gives the following advice concerning the scope and contents of EN 12200-1.

- a) EN 12200-1:2000 covers non-circular section downpipes and fittings, in addition to the circular-section pipes and fittings specified in BS 4576-1:1989.
- b) EN 12200-1:2000 is specific to rainwater downpipe systems installed outdoors. For indoor rainwater downpipe reference should be made to standards for soil and waste discharge within the building structure, e.g. BS EN 1329-1:2000.

NOTE In the UK, plastics rainwater downpipe systems installed outdoors normally have “unsealed” joints (see Table 2).

- c) In the foreword of EN 12200-1, reference is made to EN 12056-3 for the purposes of roof drainage layout and calculations. That standard is expected to replace BS 6367, to which reference was made in BS 4576-1:1989 for such purposes.
- d) Since in Table 12 reference is made to “stage 3” of the grey scale according to EN 20105-A02, the reference here and to this standard in clause 2 should be considered to relate to the current published edition (1994) of that standard.

This British Standard, having been prepared under the direction of the Sector Committee for Materials and Chemicals, was published under the authority of the Standards Committee and comes into effect on 15 November 2000

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Amendments issued since publication

Amd. No.	Date	Comments

The responsible UK committee gives the following advice concerning the definition given in **3.1.9** for the mean wall thickness (e_m). This requires “a number of measurements .. regularly spaced around ... the same cross-section ... including the measured minimum and the measured maximum values of the wall thickness in that cross-section”. In practice, the actual minimum and maximum wall thicknesses may not be diametrically opposed, in which case use of the two corresponding diameters as part of a set required to be regularly spaced may force use of an excessive number of measurements. Pending issue of any related corrigendum or amendment, the UK cannot modify the text of EN 12200-1 as ratified, but recommends that the definition given in **3.1.9** is not necessarily taken as a model for use elsewhere. Later drafts for other purposes should consider termination of the definition after “of a component”, or should consider measurement of mean wall thickness by reference to EN ISO 3126 when available.

NOTE None of the specific requirements of EN 12200-1 are actually dependent on the definition of e_m but relate to e (see **3.1.8** and e.g. Table 2).

The responsible UK committee gives the following advice concerning the marking requirements given in clause **12** which relate to the durability of the marking. In the absence of any objective criteria for durability under conditions beyond the control of the manufacturer, it is recommended that users of this standard should agree on the acceptable conditions of storage, weathering, handling and installation, e.g. by reference to the manufacturer's recommendations and/or any relevant guidance document, e.g. ENV 12200-3 or EN 12056-3 when available [see item c) of this foreword].

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

WARNING This British Standard, which is identical with EN 12200-1:2000, does not necessarily detail all the precautions necessary to meet the requirements of the Health and Safety at Work etc. Act 1974 and subsequent legislation. Attention should be paid to any appropriate safety precautions and the test methods referred to in EN 12200-1 should be operated only by trained personnel.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to and 27 and a back cover.

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English version

Plastics rainwater piping systems for above ground external use
– Unplasticized poly(vinyl chloride) (PVC-U) – Part 1:
Specifications for pipes, fittings and the system

Systèmes de canalisations de descentes d'eaux pluviales
en plastique à usage externe en aérien – Poly(chlorure de
vinyle) non plastifié (PVC-U) – Partie 1: Spécifications pour
tubes, raccords et le système

Kunststoff-Rohrleitungssysteme für außenliegende
Regenfalleitungen – Weichmacherfreies Polyvinylchlorid
(PVC-U) – Teil 1: Anforderungen an Rohre, Formstücke
und das Rohrleitungssystem

This European Standard was approved by CEN on 14 June 2000.

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 155, Plastics piping systems and ducting systems, the Secretariat of which is held by NNI.

It has been prepared in liaison with CEN/TC 128, Roofing and cladding products for discontinuous laying, taking into account EN 607 and EN 1462 and CEN/TC 165, Waste water engineering, taking into account EN 12056-3.

This standard is a part of a System Standard for plastics piping systems of a particular material for a specified application. There are a number of such System Standards.

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).

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

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

EN 12200 consists of the following parts, under the general title "*Plastics rainwater piping systems for above ground external use — Unplasticized poly(vinyl chloride) (PVC-U)*":

- Part 1: Requirements for pipes fittings and the system (the present standard).
- Part 2: Guide for the assessment of conformity.
- Part 3: Guidance for installation (ENV).

This part of EN 12200 includes the following:

- Annex A (normative): Utilization of non-virgin material.
- Bibliography.

At the date of publication of this standard, System Standards for piping systems of PVC-U and other plastics materials have been used for the same application. These standards are the following:

EN 1329, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Unplasticized poly(vinyl chloride) (PVC-U)*

EN 1451, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Polypropylene (PP)*

EN 1455, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Acrylonitrile-butadiene-styrene (ABS)*

EN 1519, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Polyethylene (PE)*

EN 1565, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Styrene copolymer blends (SAN+PVC)*

EN 1566, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Chlorinated poly(vinyl chloride) (PVC-C)*

For pipes and fittings which have conformed to the relevant national standard before the date of availability [2000-09-20], as shown by the manufacturer or by a certification body, the national standard may continue to be applied until 2002-09-31.

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 2001-03-31. Conflicting national standards shall be withdrawn at the latest by 2002-09-31.

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.

1 Scope

This standard specifies the requirements for pipes, fittings and the system of unplasticized poly(vinyl chloride) (PVC-U) intended for use as above-ground external rainwater downpipes.

It also specifies the test parameters for the test methods referred to in this standard.

These products are usually used in conjunction with gutters conforming to EN 607. They are not intended for use with products conforming to EN 612.

It is applicable to PVC-U rainwater systems of circular, square, rectangular or any other shape with sealed (rubber ring or solvent cement) or unsealed joints.

This standard covers a range of pipes and fittings sizes.

It also specifies requirements for brackets.

NOTE It is the responsibility of the purchaser or specifier to make the appropriate selections from the size range to take into account their particular requirements and any relevant national regulations and installation practices or codes.

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).

EN 513:1999,	<i>Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors — Determination of the resistance to artificial weathering</i>
EN 638,	<i>Plastics piping and ducting systems — Thermoplastics pipes — Determination of short-term tensile properties</i>
EN 681-1,	<i>Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber</i>
EN 681-2,	<i>Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastic elastomers</i>
EN 727,	<i>Plastics piping and ducting systems — Thermoplastics pipes and fittings — Determination of Vicat softening temperature (VST)</i>
EN 743:1994,	<i>Plastics piping and ducting systems — Thermoplastics pipes — Determination of the longitudinal reversion</i>
EN 744:1995,	<i>Plastics piping and ducting systems — Thermoplastics pipes — Test method for resistance to external blows by the round-the-clock method</i>
EN 763:1994,	<i>Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Test method for visually assessing effects of heating</i>
EN 922,	<i>Plastics piping and ducting systems — Pipes and fittings of unplasticized poly(vinyl chloride) (PVC-U) — Specimen preparation for determination of the viscosity number and calculation of the K value</i>
EN 1053,	<i>Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness.</i>
EN 1462,	<i>Specification for eaves gutter brackets</i>
EN 1905,	<i>Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) pipes, fittings and material — Method for assessment of the PVC content based on total chlorine content.</i>
EN 10204:1991,	<i>Metallic products — Types of inspection documents</i>
EN 12095,	<i>Plastics piping systems — Test method for bracket strength.</i>
EN 20105-AO2,	<i>Grey scale for assessing change in colour</i>

EN ISO 527-3:1995,	<i>Plastics — Determination of tensile properties — Part 3: Test conditions for film and sheets.</i>
prEN ISO 3126:1999,	<i>Plastics piping systems - Plastics components - Measurement and determination of dimensions (revision of prEN 496:1991 and ISO 3126:1974) (ISO/DIS 3126:1999)</i>
EN ISO 8256:1996,	<i>Plastics — Determination of tensile impact strength (ISO 8256:1990, including Technical Corrigendum 1:1991)</i>
ISO 472:1988,	<i>Plastics vocabulary</i>
ISO 1043-1:1997,	<i>Plastics — Symbols — Part 1: Basic polymers and their special characteristics</i>
ISO 1183:1987,	<i>Plastics — Methods for determining the density and relative density of non-cellular plastics</i>
ISO 4892-2:1994,	<i>Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon arc sources</i>
ISO 4892-3:1994,	<i>Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps</i>

3 Definitions, symbols and abbreviations

For the purposes of this standard, the following definitions, symbols and abbreviations apply.

3.1 Definitions

In addition to the definitions given below, the definitions given in ISO 472:1988 and ISO 1043-1:1997 apply.

3.1.1

nominal size DN

numerical designation of the size of a component, other than a component designated by thread size, which is approximately equal to the manufacturing dimension, in millimetres (mm)

3.1.2

nominal size DN/OD

nominal size, related to the outside diameter

3.1.3

nominal outside diameter (d_n)

specified outside diameter, in millimetres, assigned to a nominal size DN/OD

3.1.4

nominal outside diameter (d_e)

value of the measurement of the outside diameter through its cross-section at any point of a pipe or spigot of a fitting, rounded to the next greater 0,1 mm

3.1.5

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 ($\approx 3,142$), rounded to the next greater 0,1 mm

3.1.6

mean inside diameter of a pipe (d_{im})

arithmetical mean of a number of measurements of the inside diameter of a pipe in the same cross-section

3.1.7

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

3.1.8

wall thickness (e)

value of the measurement of the wall thickness at any point around the circumference of a component rounded to the next greater 0,1 mm

3.1.9

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 Definitions for brackets

3.2.1

anchor bracket

bracket designed to be fixed to a wall or other support and attached to a socket of a pipe or fitting to prevent the socket from moving under the effect of thermal expansion

NOTE Some anchor brackets can be adapted to act as a guide bracket. (See 3.2.2)

3.2.2

guide bracket

bracket designed to be fixed to a wall or other support and to fit a pipe sufficiently loosely to allow longitudinal thermal movement whilst preventing the pipe from bowing between anchor brackets

NOTE By fixing an guide bracket tightly below a fitting on vertical pipework, it can be made to act as an anchor bracket. (See 3.2.1)

3.3 Symbols

A	: length of engagement
C	: depth of sealing zone
d_e	: outside diameter
d_{em}	: mean outside diameter
d_{im}	: mean inside diameter of pipe or spigot
d_n	: nominal outside diameter
d_s	: inside diameter of a socket
d_{sm}	: mean inside diameter of a socket
e	: wall thickness (at any point)
e_m	: mean wall thickness
e_2	: wall thickness of a socket
e_3	: wall thickness at the groove
L_1	: length of spigot
L_2	: length of socket
l	: effective length of a pipe
Z_d	: design length (Z_d length) of a fitting
α	: nominal angle of a fitting

3.4 Abbreviations

DN	: nominal size
DN/OD	: nominal size, outside diameter related
PVC-U	: unplasticized poly(vinyl chloride)
TIR	: true impact rate