

# INTERNATIONAL STANDARD

**ISO**  
**1452-5**

First edition  
2009-12-01

---

---

## **Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC-U) —**

### **Part 5: Fitness for purpose of the system**

*Systèmes de canalisations en plastique pour l'alimentation en eau, pour  
branchements et collecteurs d'assainissement enterrés et aériens avec  
pression — Poly(chlorure de vinyle) non plastifié (PVC-U) —*

*Partie 5: Aptitude à l'emploi du système*



Reference number  
ISO 1452-5:2009(E)

© ISO 2009

## ISO 1452-5:2009(E)

### PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



### COPYRIGHT PROTECTED DOCUMENT

© ISO 2009

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword .....</b>	<b>iv</b>
<b>Introduction.....</b>	<b>v</b>
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions, symbols and abbreviations .....</b>	<b>2</b>
<b>4 Fitness for purpose of joints and the system.....</b>	<b>2</b>
<b>4.1 Assemblies with non-end-load-bearing joints.....</b>	<b>2</b>
<b>4.2 Assemblies with end-load-bearing joints .....</b>	<b>3</b>
<b>4.3 Short-term pressure test for leaktightness of assemblies.....</b>	<b>3</b>
<b>4.4 Short-term negative pressure test for leaktightness of assemblies.....</b>	<b>4</b>
<b>4.5 Long-term pressure test for leaktightness of assemblies .....</b>	<b>5</b>
<b>Annex A (normative) Assemblies of imperial (inch)-sized pipes, fittings, valves and ancillaries .....</b>	<b>7</b>
<b>Annex B (informative) Determination of the long-term test pressure by creep consideration.....</b>	<b>9</b>
<b>Bibliography.....</b>	<b>13</b>

## ISO 1452-5:2009(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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

ISO 1452-5 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 155, *Plastics piping systems and ducting systems*, in collaboration with ISO Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 2, *Plastics pipes and fittings for water supplies*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition cancels and replaces ISO 4422-5:1997, which has been technically revised.

ISO 1452 consists of the following parts, under the general title *Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC-U)*:

- *Part 1: General*
- *Part 2: Pipes*
- *Part 3: Fittings*
- *Part 4: Valves*
- *Part 5: Fitness for purpose of the system*

Guidance for the assessment of conformity is to form the subject of a part 7.

## **Introduction**

The System Standard, of which this is Part 5, specifies the requirements for a piping system and its components made from unplasticized poly(vinyl chloride) (PVC-U). The piping system is intended to be used for water supply and for buried and above-ground drainage and sewerage under pressure.

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the products covered by this part of ISO 1452, the following are relevant.

- a) This part of ISO 1452 provides no information as to whether the products may be used without restriction;
- b) Existing national regulations concerning the use and/or the characteristics of these products remain in force.

Requirements and test methods for components requirements and test methods are specified in ISO 1452-2, ISO 1452-3 and ISO 1452-4.

This part of ISO 1452 establishes the characteristics of fitness for purpose of the plastics piping system composed of pipes, fittings, valves, ancillaries and their joints.

Guidance for installation is given in ISO/TR 4191<sup>[1]</sup>.

Guidance for assessment of conformity is provided in ENV 1452-7<sup>[2]</sup>.



# Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC-U) —

## Part 5: Fitness for purpose of the system

### 1 Scope

This part of ISO 1452 specifies the characteristics for the fitness for purpose of unplasticized poly(vinyl chloride) (PVC-U) piping systems intended for water supply and for buried and above-ground drainage and sewerage under pressure.

It also specifies the test parameters for the test methods referred to in this part of ISO 1452.

In conjunction with ISO 1452-1, ISO 1452-2, ISO 1452-3 and ISO 1452-4, it is applicable to joints and assemblies with components of PVC-U, other plastics and non-plastics materials intended to be used for the following:

- a) water mains and services buried in ground;
- b) conveyance of water above ground for both outside and inside buildings;
- c) buried and above-ground drainage and sewerage under pressure;

It is applicable to piping systems intended for the supply of water under pressure up to and including 25 °C (cold water) intended for human consumption and for general purposes as well as for waste water under pressure.

This part of ISO 1452 is also applicable to components for the conveyance of water and waste water up to and including 45 °C. For temperatures between 25 °C and 45 °C, Figure A.1 of ISO 1452-2:2009 applies.

**NOTE** The producer and the end-user can come to agreement on the possibilities of use for temperatures above 45 °C on a case-by-case basis.

### 2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 1452-1, *Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: General*

ISO 1452-2:2009, *Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC-U) — Part 2: Pipes*

## ISO 1452-5:2009(E)

ISO 1452-3:2009, *Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC U) — Part 3: Fittings*

ISO 1452-4, *Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure — Unplasticized poly(vinyl chloride) (PVC U) — Part 4: Valves*

ISO 13783, *Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) end-load-bearing double-socket joints — Test method for leaktightness and strength while subjected to bending and internal pressure*

ISO 13844, *Plastics piping systems — Elastomeric-sealing-ring-type socket joints of unplasticized poly(vinyl chloride) (PVC-U) for use with PVC-U pipes — Test method for leaktightness under negative pressure*

ISO 13845, *Plastics piping systems — Elastomeric-sealing-ring-type socket joints for use with unplasticized poly(vinyl chloride) (PVC-U) pipes — Test method for leaktightness under internal pressure and with angular deflection*

ISO 13846, *Plastics piping systems — End-load-bearing and non-end-load-bearing assemblies and joints for thermoplastics pressure piping — Test method for long-term leaktightness under internal water pressure*

### 3 Terms and definitions, symbols and abbreviations

For the purposes of this document, the terms, definitions, symbols and abbreviated terms given in ISO 1452-1 apply.

### 4 Fitness for purpose of joints and the system

#### 4.1 Assemblies with non-end-load-bearing joints

The following types of assemblies with non-end-load-bearing joints shall fulfil the fitness for purpose requirements given in 4.3 to 4.5 and Tables 1 and 2, as applicable:

- a) integrally socketed PVC-U pipe to pipe assemblies with elastomeric ring seal joints conforming to ISO 1452-2;
- b) PVC-U fitting and pipe assemblies with elastomeric ring seal joints conforming to ISO 1452-3 and ISO 1452-2, respectively;
- c) PVC-U valve and pipe assemblies with elastomeric ring seal joints conforming to ISO 1452-4 and ISO 1452-2, respectively;
- d) metal fitting and PVC-U pipe assemblies with elastomeric ring seal joints;
- e) metal valve and PVC-U pipe assemblies with elastomeric ring seal joints;
- f) PVC-U, GRP or metal adaptor assemblies with elastomeric ring seal joints for PVC-U pipes and with flanged, threaded or other connections to pipes of different materials or to ancillary equipment, such as tapping saddles;
- g) mechanical joint assemblies with PVC-U pipes.

The components of the assemblies of types b) to g) shall be assembled with PVC-U pipes of the corresponding nominal pressure, PN, or pipe series S conforming to ISO 1452-2. The assembly instructions of the component manufacturer shall be followed.