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**Cevni sistemi iz polimernih materialov - Cevi iz nemehčane polivinilklorida (PVC-U) - Metoda za preskus odpornosti na diklormetan pri določeni temperaturi (DCMT)**

Plastics piping systems - Unplasticized poly(vinyl chloride)(PVC-U) pipes - Test method for the resistance to dichloromethane at a specified temperature (DCMT)

Kunststoff-Rohrleitungssysteme - Rohre aus weichmacherfreiem Polyvinylchlorid(PVC-U) - Prüfverfahren für die Beständigkeit gegen Dichloromethan bei einer festgelegten Temperatur (DCMT)

Systemes de canalisations en plastiques - Tubes en poly(chlorure de vinyl) non-plastifié (PVC-U) - Méthode d'essai de la résistance au dichlorométhane a une température spécifiée (DCMT)

**Ta slovenski standard je istoveten z: EN 580:1993**

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English version

**Plastics piping systems - Unplasticized poly(vinyl chloride)(PVC-U) pipes - Test method for the resistance to dichloromethane at a specified temperature (DCMT)**

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REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO  
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LJUBLJANA

SIST. EN 580  
PREVZET PO METODI RAZGLASITVE

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This European Standard was approved by CEN on 1993-06-25. 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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**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

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## Foreword

This standard was prepared by CEN/TC 155 "Plastics piping systems and ducting systems".

This standard is based on the draft Technical Report ISO/DTR 9852 "Unplasticized polyvinyl chloride (PVC-U) pipes - Dichloromethane resistance temperature (DCMT) - Test method and basic specification" prepared by the International Organization for Standardization (ISO). It is a modification of ISO/DTR 9852 for reasons of alignment with texts of other standards on test methods.

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of an identical text or by endorsement, at the latest by January 1994, and conflicting national standards shall be withdrawn at the latest by January 1994.

The modifications are:

- no product requirements are given;
- editorial changes have been introduced.

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Annex A, which is informative, gives a basis for describing the amount of attack.

The material-dependent test parameters and/or performance requirements are incorporated in the referring standard(s).

No existing European Standard is superseded by this standard.

This Standard was approved and in accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

## Introduction

The maximum temperature at which the unplasticized poly(vinyl chloride) (PVC-U) pipe is not attacked by dichloromethane gives an indication of the level and homogeneity of gelation of the pipe. This characteristic is related to the mechanical properties and, in particular, the long-term pressure resistance of the pipe.



**Plastics piping systems - Unplasticized poly(vinylchloride) (PVC-U) pipes - Test method for the resistance to dichloromethane at a specified temperature (DCMT)**

## 1 Scope

This standard specifies a method for determining the resistance of unplasticized poly(vinyl chloride) (PVC-U) pipes to dichloromethane at a specified temperature (DCMT).

This standard is applicable to PVC-U pipes, irrespective of their use. The method can be used as a rapid means of quality control during manufacture.

NOTE: The temperature of the dichloromethane at which PVC-U shall not be attacked, is specified in the referring standard.

## 2 Principle

A piece of PVC-U pipe, of specified length, chamfered at one end to an angle dependent on its thickness, is immersed for  $(30 \pm 1)$  min in dichloromethane at a specified temperature to verify that the PVC-U is not attacked at that temperature. [SIST EN 580:1997](https://standards.iteh.ai/catalog/standards/sist/a96b9df0-e11d-4bd7-8bd7-e14e16ab66e6/sist-en-580-1997)

NOTE 1: If the PVC-U has not sufficiently gelled, whitening of the surface will occur and, in the worst case, a precipitate will be observed.

NOTE 2: It is assumed that the following test parameters are specified in the standard making reference to this standard:

- a) the control temperature,  $T$ , for the dichloromethane (see 4.2 and 6.3);
- b) the minimum wall thickness for which the test shall be applied.

## 3 Reagent

Dichloromethane, technical grade.

WARNING: The boiling temperature of dichloromethane is low ( $40\text{ }^{\circ}\text{C}$ ). Consequently, it has a high vapour pressure at ambient temperature. Further, it can be toxic to skin and eyes. It is, therefore, necessary to take precautions when handling dichloromethane or test pieces which have been immersed in it.

The vapours are also toxic: the threshold limit value (T.L.V.)

comparable to the maximum admissible concentration (M.A.C.) is 100 ml/m<sup>3</sup> (ppm). Ventilation of the room or the area in which the container is placed and where the drying of the test piece takes place is, therefore, essential.

NOTE: Dichloromethane, technical grade, contains small quantities (1 % maximum each) of chloromethane (CH<sub>3</sub>Cl), of trichloromethane (CHCl<sub>3</sub>) and of tetrachloromethane (CCl<sub>4</sub>).

It has been noted that even if the level of these impurities were to attain 5 % in total, the results would not be significantly different.

## 4 Apparatus

4.1 Chamfering machine (see 5.2).

4.2 Glass or stainless steel container, of suitable dimensions to accommodate one or more test pieces (see clause 5), with a grating maintained at approximately 10 mm above the bottom of the container, a lid to limit evaporation of the liquid (see 6.1 and 6.2) and thermostatic control, with stirrer, capable of maintaining the temperature of the liquid at  $(T \pm 0,5)$  °C with the help of the refrigeration equipment (4.3).

4.3 Refrigeration equipment, capable of cooling the dichloromethane to the temperature as specified in the referring standard.

4.4 Hood fitted with a fume extraction system, for safety reasons (see warning in clause 3) mounted over the container (4.2).

## 5 Preparation of the test piece

5.1 Cut from the pipe to be tested a test piece 160 mm in length, such that the cut ends are perpendicular to the axis of the pipe.

5.2 Chamfer, by cutting without tangible heating (see note), one of the ends of the test piece over its complete thickness. The angle of chamfer depends on the thickness of the pipe as given in table 1 [see item b) of note 2 to clause 2].

NOTE: The term "cutting" is intended to exclude grinding.

Table 1

| Pipe wall thickness (e)<br>mm | Chamfering angle<br>degrees |
|-------------------------------|-----------------------------|
| $e < 8$                       | 10                          |
| $8 \leq e < 16$               | 20                          |
| $16 \leq e$                   | 30                          |

5.3 Cool the test piece to ambient temperature.

## 6 Immersion conditions

6.1 Fill the container with sufficient dichloromethane of known refractive index to immerse the necessary portion of the test piece (see 7.2).

6.2 Cover the dichloromethane with a layer of water, not less than 20 mm deep.

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NOTE: The water layer is for the purpose of reducing evaporation (normally  $0,6 \text{ l/m}^2 \cdot \text{h}$  at  $(23 \pm 2) \text{ }^\circ\text{C}$ ) of the dichloromethane and to protect the operator from any harmful effects of the vapour.

The water used for the test should be disposed of only in accordance with the relevant legislation.

6.3 Using the temperature controls, refrigeration equipment and stirrer as appropriate, establish and maintain the temperature of the dichloromethane in the container at  $(T \pm 0,5) \text{ }^\circ\text{C}$  [see item a) of note 2 to clause 2].

6.4 Maintain the level of dichloromethane in the container.

6.5 Ensure that the refractive index of the dichloromethane does not vary in service by more than  $\pm 0,002$  from its initial value.

NOTE: In practice, the refractive index varies by 0,0005 every 3 months when some 700 to 800 tests are carried out per month. A check on the quality of the bath every 3 months should suffice.

## 7 Procedure

7.1 For the duration of the test, avoid touching the test piece with fingers (see warning in clause 3), e.g. by using tongs and gloves.

7.2 Place the test piece in the liquid so that the chamfered zone is completely immersed in the dichloromethane.

7.3 Leave the test piece for  $(30 \pm 1)$  min in the dichloromethane.

7.4 Remove the test piece from the container and leave it to dry in the air for at least 15 min in a well ventilated area or under a hood equipped with a ventilation system.

7.5 Examine the test piece and determine the results in accordance with clause 8.

## 8 Expression of results

8.1 If the test piece shows no sign of attack anywhere (other than swelling), express the result as "No attack".

8.2 If the test piece shows signs of attack anywhere, express the result as "Attacked" and describe the appearance and location of the attack.

NOTE: For a possible description of the attack on the chamfer, see annex A.

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## 9 Test report

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The test report shall include the following information:

- a) a reference to this standard and to the referring standard;
- b) complete identification of the pipe under test;
- c) the temperature,  $T$ , of the dichloromethane bath;
- d) the immersion time;
- e) the number of test pieces under test;
- f) the results of the test and any associated information;
- g) any factors which may have affected the results, such as any incidents or any operating details not specified in this standard;
- h) the date of test.