SLOVENSKI STANDARD
SIST EN 922:1997

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Cevni sistemi iz polimernih materialov - Cevi in fitingi iz nemehčanega polivinilklorida (PVC-U) - Priprava vzorcev za določanje viskoznostnega števila in izračunavanje K-vrednosti

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

Kunststoff-Rohrleitungs- und Schutzrohrsysteme - Rohre und Formstücke aus weichmacherfreiem Polyvinylchlorid (PVC-U) - Vorbereitung der Proben zur Bestimmung der Viskositätszahl und Berechnung des K-Wertes

Systemes de canalisations et de gaines en plastiques - Tubes et raccords en poly (chlorure de vinyle) non-plastifié (PVC-U) - Préparation d'un échantillon pour la détermination de l'indice de viscosité et le calcul de la valeur-K

Ta slovenski standard je istoveten z: **EN 922:1994**

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English version

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

Systèmes de canalisations et des gaines en plastiques - Tubes et raccords en poly(chlorure de vinyle) non-plastifié (PVC-U) - Préparation d'un échantillon pour la détermination de l'indice de viscosité et le calcul de la valeur-K

Kunststoff-Rohrleitungs- und Schutzrohrsysteme - Rohre und Formstücke aus weichmacherfreiem Polyvinylchlorid (PVC-U) - Vorbereitung der Proben zur Bestimmung der Viskositätszahl und Berechnung des K-Wertes

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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", the secretariat of which is held by NNI.

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of an identical text or by endorsement, at the latest by March 1995, and conflicting national standards shall be withdrawn at the latest by March 1995.

Annex A, which is informative, gives the K-values corresponding to viscosity numbers obtained under specific test conditions.

No existing European Standard is superseded by this standard.

This standard is one of a series of standards on test methods which support System Standards for plastics piping systems and ducting systems.

This standard has been prepared under a mandate given to CEN by the Commission of the European Communities and the European Free Trade Association, and supports essential requirements of the EC Directive(s).

According to 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.

1 Scope

This standard specifies a method for determining the viscosity number and K-value of a poly(vinyl chloride) (PVC) resin derived from a pipe, fitting or compound.

In this standard, only the method for isolation of the PVC resin is detailed, while for the determination of viscosity number reference is made to ISO 174. An equation for the calculation of K-value (according to Fikentscher) from viscosity data is given (K-values corresponding to a series of viscosity numbers for PVC resin are given for information in annex A).

The presence of other polymers may invalidate the method (see clause 3).

2 Normative references

This 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 revision of, any of these publications apply to this standard only when incorporated in it by amendment or revision.
For undated references the latest edition of the publication referred to applies.

ISO 174:1974 Plastics - Homopolymer and copolymer resins of vinyl chloride - Determination of viscosity number in dilute solution

3 Principle

PVC resin, contained in a sample taken from a pipe or fitting or as compound, is seperated from most additives by solution in tetrahydrofuran (THF) and precipitation by methanol from a portion of the solution which has been isolated by centrifuging and decantation. The presence of

additives in injection-moulding compounds may affect the results for materials for/from injection-moulded fittings.

If other polymers also soluble in THF and insoluble in methanol (e.g. PMMA) are present, this method cannot be used.

The precipitate is used for estimation of the viscosity number and K-value in accordance with method 2 of ISO 174.

4 Reagents for isolation of the PVC resin

4.1 Tetrahydrofuran, (THF), stabilized.

4.2 Methanol (CH_3OH).

5 Apparatus for isolation of the PVC resin

5.1 Glass container, of at least 100 ml capacity.

5.2 Magnetic stirrer.

5.3 Glass beaker, 600 ml, tall form.

5.4 Filter funnel.

5.5 Laboratory filter paper, capable of retaining polymer precipitated in accordance with 6.1.

5.6 Centrifuge with centrifuge tubes, for 50 ml.

5.7 Vacuum desiccator.

5.8 Water bath, if necessary (see 6.1).

5.9 Pasteur pipette, if necessary (see 6.1).

6 Procedure

6.1 Isolation of the PVC resin

Take about 2 g of PVC compound (2,5 g if the filler content is expected to be high), cut, if necessary, from a pipe or fitting and dissolve it in about 50 ml of THF in a glass container (5.1), with stirring. Should solution be slow, cautiously warm in a water bath.

NOTE: it is important that the PVC-resin is completely dissolved before proceding.

Transfer the solution to a centrifugal tube and centrifuge for about 40 min.

Decant that part of the THF solution free from particles, if necessary using a pasteur pipette, into the glass beaker (5.3), without entraining any filler.

In the beaker, precipitate the polymer by cautiously adding methanol, with stirring, until 10 parts of methanol have been added per part of THF solution.

Filter the suspension using filter paper and wash the precipitate with methanol. Transfer the precipitated polymer, but not the filter paper, to a bowl and dry for at least 12 h in a vacuum desiccator at 50 °C.

6.2 Determination of viscosity number

Determine and record the viscosity number, in millilitres per gram, in accordance with method 2 of ISO 174, using (0,2510 ± 0,0002) g resin in accordance with the note in 6.1.2 of ISO 174 (by solution in cyclohexanone).

7 Calculation of K-value

Calculate the K-value of the resin in accordance with the following equation:

$$K = \frac{1{,}5 \lg\frac{t_s}{t_o} - 1 + \left[1 + (402 + 1{,}5 \lg\frac{t_s}{t_o})\, 1{,}5 \lg\frac{t_s}{t_o}\right]^{0{,}5}}{151{,}5} * 1000 \quad ...(1)$$

where:

t_s is the flow time of the solution in accordance with ISO 174;

t_o is the flow time of the solvent in accordance with ISO 174.

8 Precision

The method determines the K-value to an accuracy of ± 2.

9 Test report

The test report shall include the following information:

a) a reference to this standard and to the referring standard;

b) the identity of the pipe, fitting or compound, under test;

c) the viscosity number of the resin;

d) the K-value of the resin;

e) any factors which may have affected the results, such as any incidents or any operating details not specified in this standard;

f) the date of test.