



# SLOVENSKI STANDARD

## SIST EN 12704:2012

01-september-2012

Nadomešča:  
SIST EN 12704:2000

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**Lepila za papir in karton za embalažo in za higienske proizvode za enkratno uporabo - Ugotavljanje nastajanja pene pri vodnih vrstah lepil**

Adhesives for paper and board, packaging and disposable sanitary products - Determination of foam formation for aqueous adhesives

Klebstoffe für Papier, Verpackung und Hygieneprodukte - Bestimmung der Schaumbildung von wässrigen Klebstoffen

Adhésifs pour papier, carton, emballage et produits sanitaires jetables - Détermination de la formation de mousse des adhésifs aqueux

**Ta slovenski standard je istoveten z: EN 12704:2012**

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**ICS:**

55.040	Materiali in pripomočki za pakiranje	Packaging materials and accessories
83.180	Lepila	Adhesives

**SIST EN 12704:2012** en,fr,de

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EUROPEAN STANDARD

**EN 12704**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2012

ICS 83.180

Supersedes EN 12704:1999

English Version

## Adhesives for paper and board, packaging and disposable sanitary products - Determination of foam formation for aqueous adhesives

Adhésifs pour papier, carton, emballage et produits sanitaires jetables - Détermination de la formation de mousse des adhésifs aqueux

Klebstoffe für Papier, Verpackung und Hygieneprodukte - Bestimmung der Schaumbildung von wässrigen Klebstoffen

This European Standard was approved by CEN on 5 February 2012.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom



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## Foreword

This document (EN 12704:2012) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

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 September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

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

This document supersedes EN 12704:1999.

**SAFETY STATEMENT** — Persons using this document should be familiar with the normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

**ENVIRONMENTAL STATEMENT** — It is understood that some of the material permitted in this European Standard may have negative environmental impact. As technological advantages lead to acceptable alternatives for these materials, they will be as far as possible eliminated from this European Standard. At the end of the test, the user of this European Standard should take care to carry out an appropriate disposal of the wastes, according to local regulation.

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**EN 12704:2012 (E)****1 Scope**

This European Standard specifies a test method to determine the foam formation, or air entrainment during rapid stirring of aqueous adhesives with a maximum viscosity of 10 000 MPa · s at room temperature determined in accordance with EN 12092.

**2 Normative references**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 923, *Adhesives — Terms and definitions*

EN 1067, *Adhesives — Examination and preparation of samples for testing*

EN 12092, *Adhesives — Determination of viscosity*

EN ISO 15605, *Adhesives — Sampling (ISO 15605)*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

**3 Terms and definitions**

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For the purposes of this document, the terms and definitions given in EN 923 apply.

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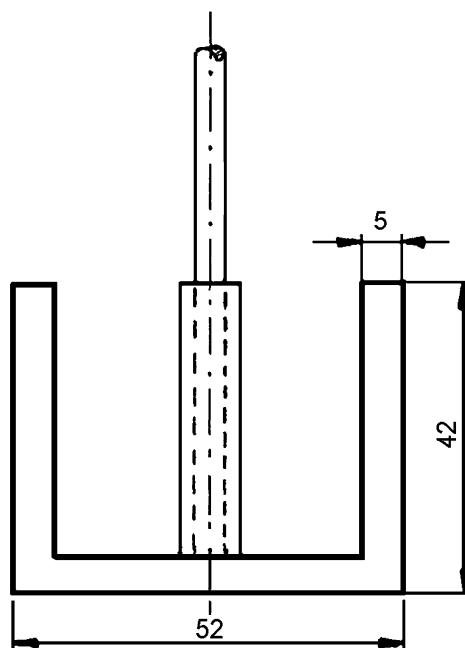
**4 Principle**

The adhesive is stirred under defined conditions and the foam formation determined from the differences between the initial and final volumes of the adhesive.

**5 Apparatus**

- 5.1 **Stirrer motor**, capable of driving the stirrer at an adjustable rotary speed up to 3 000 min<sup>-1</sup>.
- 5.2 **Stirrer**, with dimensions as shown in Figure 1.
- 5.3 **Beaker**, 2 l, of transparent material of approximately dimensions,  $h = 230$  mm,  $d = 105$  mm.
- 5.4 **Balance**, accuracy 1,0 g.
- 5.5 **Mechanical system**, to secure the stirrer and beaker.
- 5.6 **Timer**, accuracy 1 s.
- 5.7 **Ruler**, accuracy 1 mm.

Dimensions in millimetres



**Figure 1 – Stirrer**  
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## 6 Procedure

**6.1** Take the sample in accordance with EN ISO 15605 and prepare the sample in accordance with EN 1067.

Weigh ( $400 \pm 10$ ) g directly into the clean beaker (5.3).

**6.2** Condition the sample at temperature of ( $23 \pm 2$ ) °C and ( $50 \pm 5$ ) % relative humidity in accordance with ISO 554.

**6.3** Position the stirrer (5.2) in the beaker so that it is approximately 1 mm from the bottom and the shaft of the stirrer is in the centre of the beaker, ( $\pm 1,00$  mm).

**6.4** Measure the initial height  $h_i$  (in millimetres) of the adhesive in the beaker.

**6.5** Begin stirring slowly and increase to  $2\,500\text{ min}^{-1}$  over 10 s.

**6.6** Start the timer (5.6) and continue stirring for 5 min.

**6.7** Stop stirring and immediately measure the final max height  $h_f$  (in millimetres) of the adhesive in the beaker.

**6.8** Measure the height of the adhesive also after 1 min and 5 min.

**6.9** Carry out a minimum of 3 tests, each test consisting of three measurements of adhesive height after stirring (immediately, 1 min and 5 min), as described in 6.7 and 6.8.

**NOTE** Comparison of the values of adhesive height taken immediately after stirring, after 1 min after 5 min are an indication of foam stability. Faster decrease in foam height with time means worse foam stability.

**EN 12704:2012 (E)****7 Expression of results**

Calculate the Foam Formation,  $f$ , as a percentage, calculated from the difference in height of the adhesive before and after stirring, using the following formula (1):

$$f (\%) = \frac{h_f - h_i}{h_i} \times 100 \quad (1)$$

where

$h_f$  is the final height of adhesive after stirring, in millimetres;

$h_i$  is the initial height of adhesive before stirring, in millimetres;

$f (\%)$  is the foam formation, as %.

In each test, calculate the foam formation as the arithmetic mean of the results of the three measurements of adhesive height carried out immediately after stirring, after 1 min and after 5 min. Express the final value of Foam Formation obtained in the last three tests.

**8 Test report**

Test report shall include, at least, the following:

- a) a reference to this European Standard, i.e. EN 12704:2012;
- b) identification of the adhesive, giving all information for the sample;
- c) description of the adhesive (i.e. chemical type, pH, viscosity);
- d) number of tests carried out;
- e) foam formation;
- f) date of test.