



# SLOVENSKI STANDARD

## SIST EN 827:2006

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SIST EN 827:1998

Adhesives - Determination of conventional solids content and constant mass solids content

Klebstoffe - Bestimmung des Feststoffgehaltes nach Vereinbarung und bis zur Massekonstanz

Adhésifs - Détermination de l'extrait sec conventionnel et de l'extrait sec a masse constante

Ta slovenski standard je istoveten z: EN 827:2005

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en

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 827**

December 2005

ICS 83.180

Supersedes EN 827:1994

English Version

**Adhesives - Determination of conventional solids content and  
constant mass solids content**

Adhésifs - Détermination de l'extrait sec conventionnel et  
de l'extrait sec à masse constante

Klebstoffe - Bestimmung des Feststoffgehaltes nach  
Vereinbarung und bis zur Massekonstanz

This European Standard was approved by CEN on 21 November 2005.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

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## Foreword

This European Standard (EN 827:2005) 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 June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

This European Standard supersedes EN 827:1994.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## EN 827:2005 (E)

**SAFETY STATEMENT:** Persons using this European Standard should be familiar with the normal laboratory practice, in principle. This European Standard 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.

## 1 Scope

This European Standard specifies a method for the determination of conventional solids content and, where possible, constant mass solids content.

It is applicable to dispersion, emulsion and solvent based adhesives.

## 2 Normative references

The following referenced documents are indispensable for the application of this European Standard. 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 ISO 15605, *Adhesives — Sampling (ISO 15605:2000)*

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 923 and the following apply.

### 3.1

#### **conventional solids content**

solids content obtained by heating a conventional amount of the sample placed in a given vessel at a given temperature for a specific time

### 3.2

#### **constant mass solids content**

solids content obtained by heating the sample for successive intervals until the volatile components have evaporated and the residue reaches a constant mass

## 4 Safety

**WARNING —** During the test dangerous volatile products (toxic, harmful, flammable) might be evolved. Particular attention should be paid to protect the operators, using suitable equipment such as extraction fans.

## 5 Apparatus

### 5.1

**Oven with natural ventilation**, capable of keeping the test temperature constant within  $\pm 1$  °C.

### 5.2

**Oven with forced ventilation**, capable of keeping the test temperature constant within  $\pm 1$  °C.

### 5.3

**Analytical balance**, accurate to 0,1 mg.

### 5.4

**Flat bottomed thin metal container**, e.g. metal lid, with the diameter and depth as indicated in 7.6.1.

### 5.5

**Desiccator**, with appropriate desiccant.

## 6 Sampling

Take a representative sample of the adhesives to be tested, in accordance with EN ISO 15605 and prepare it in accordance with EN 1067.

## 7 Procedure

The following procedure shall be carried out in duplicate:

**7.1** Place the clean container (5.4) in the oven (5.1 or 5.2 according to 7.6.1) at the test temperature for about 30 min then let it cool in the desiccator (5.5) for at least 15 min.

**7.2** Using the analytical balance (5.3) weigh the container (5.4) to the nearest 0,1 mg and let  $m_1$  be the mass in grams.

**7.3** Transfer carefully a test portion of 1 g to 5 g of adhesive according to 7.6.1, into the container (5.4) and weigh to the nearest 0,1 mg and let  $m_2$  be the mass in grams.

**7.4** Place the container in the oven (5.1 or 5.2 according to 7.6.1) and dry at the temperature and for the time specified in 7.6.

**7.5** Remove the container from the oven, cool it in a desiccator (5.5) for at least 15 min, and weigh it to the nearest 0,1 mg and let  $m_3$  be the mass in grams.

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## 7.6 Oven drying conditions

## 7.6.1 Determination of conventional solids content

Table 1 — Test conditions

Types of adhesives	Quantity sample (g)	Diameter metal container <sup>d</sup> (mm)	Temperature <sup>c</sup> (°C)	Time (min)	Type of oven
<i>Natural adhesives</i>					
– Adhesives of vegetable origin	2 ± 0,2	60 ± 5	105 ± 1	120 ± 1	Forced ventilation (5.2)
– Adhesives of animal origin	2 ± 0,2	60 ± 5	105 ± 1	120 ± 1	Forced ventilation (5.2)
<i>Synthetic adhesives</i>					
– Phenolic resins <sup>a</sup>	2 ± 0,2	60 ± 5	135 ± 1	180 ± 1	Natural ventilation (5.1)
– Phenolic resins for wood applications <sup>a</sup>	2 ± 0,2	35 ± 5	120 ± 1	120 ± 1	Natural ventilation (5.1)
– Amino resins	2 ± 0,2	35 ± 5	120 ± 1	120 ± 1	Natural ventilation (5.1)
– Poly(vinyl alcohol) type	2 ± 0,2	60 ± 5	105 ± 1	120 ± 1	Natural ventilation (5.1)
<i>Aqueous dispersion adhesives</i>					
– Vinyl polymers and copolymers	1 ± 0,1	60 ± 5	105 ± 1	60 ± 1	Natural ventilation (5.1)
– Acrylate polymers and copolymers	1 ± 0,1	60 ± 5	105 ± 1	60 ± 1	Natural ventilation (5.1)
– Miscellaneous synthetics	1 ± 0,1	60 ± 5	105 ± 1	60 ± 1	Natural ventilation (5.1)
– Natural rubbers for latex	1 ± 0,1	60 ± 5	105 ± 1	60 ± 1	Natural ventilation (5.1)
– Polyurethanes	1 ± 0,1	60 ± 5	105 ± 1	60 ± 1	Natural ventilation (5.1)
– Plasticized polymers	1 ± 0,1	60 ± 5	80 ± 1	60 ± 1	Natural ventilation (5.1)
<i>Organic solvent based adhesives</i>					
– Inert adhesives	1 ± 0,1	60 ± 5	105 ± 1	120 ± 1	Forced ventilation (5.2)
– Reactive adhesives <sup>b</sup>	Test conditions shall be agreed in advance between the parties				

<sup>a</sup> It can be necessary to dilute certain adhesives based on phenolic resins with alcohol so that the test portion can be spread readily.

<sup>b</sup> Unlike the other organic solvent based adhesives the components of reactive products are in the intermediate state between monomer and polymer. These adhesives can have a significant vapour pressure at 105 °C which can result in a loss of active ingredient; therefore under normal conditions of use, these active ingredients are an integral part of the solids content. Under these circumstances the determination of the solids content of such adhesives is uncertain.

<sup>c</sup> The required temperature varies according to the type of product under test and depends in particular on the risk of heat degradation, volatility of the solvents and the possibility of reactions such as polycondensations. It is essential that the required temperature tolerance is achieved. Ovens used shall therefore be examined to ensure that the internal temperature distribution is such that these requirements are fully complied with.

<sup>d</sup> The metal container depth is important as well. It shall be between 3 mm and 10 mm.



### 7.6.2 Determination of the constant mass solids content

This procedure shall not be used with phenolic resins and amino resins.

Continue drying for about 2 h at a temperature as indicated in 7.6.1.

Weight the container after conditioning in a desiccator (5.5) to the nearest 0,1 mg.

Dry for further successive intervals of approximately 30 min. When successive weighings do not differ by more than 2 mg, the lower of the two shall be taken as  $m_4$  (in grams).

If constant mass is not achieved after five cycles, this method is considered unsuitable for measuring the solids content of the product under test.

## 8 Expression of results

### 8.1 Conventional solids content (C1)

Express the result of each of the two tests as a percentage by mass using the following Equation (1):

$$C1 = \frac{m_3 - m_1}{m_2 - m_1} \times 100 \quad [\%] \quad (1)$$

Calculate the arithmetic mean and report it rounded to the first decimal.

The difference between each measurement and the mean shall be less than 1 % of this mean; otherwise repeat the test in duplicate.

### 8.2 Constant mass solids content (C2)

Express the result of each of the two tests as a percentage by mass using the following Equation (2):

$$C2 = \frac{m_4 - m_1}{m_2 - m_1} \times 100 \quad [\%] \quad (2)$$

Calculate the arithmetic mean and report it rounded to the first decimal.

The difference between each measurement and the mean shall be less than 2 % of this mean; otherwise repeat the test.