

# SLOVENSKI STANDARD

## SIST EN 13048:2001

01-februar-2001

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**Embalaža - Upogibne aluminijaste tube - Metoda za merjenje debeline notranjega laka**

Packaging - Flexible aluminium tubes - Internal lacquer film thickness measurement method

Packmittel - Aluminiumtuben - Verfahren zur Bestimmung der Dicke des Innenschutzlackes

Emballage - Tubes souples en aluminium - Méthode de détermination de l'épaisseur de vernis intérieur

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**Ta slovenski standard je istoveten z: EN 13048:2000**

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**ICS:**

55.120

Pločevinke. Tube

Cans. Tins. Tubes

77.150.10

Aluminijski izdelki

Aluminium products

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**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 13048

July 2000

ICS 55.120

English version

Packaging - Flexible aluminium tubes - Internal lacquer film  
thickness measurement method

Emballage - Tubes souples en aluminium - Méthode de  
détermination de l'épaisseur de vernis intérieur

Packmittel - Aluminiumtuben - Verfahren zur Bestimmung  
der Dicke des Innenschutzlackes

This European Standard was approved by CEN on 15 June 2000.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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ALTERNATIVE STANDARD  
NOTE IN TECHNICAL SPECIFICATIONS  
OF THE INTERNATIONAL ORGANIZATION OF  
STANDARDIZATION

.....  
INTERNATIONAL ORGANIZATION OF STANDARDIZATION

## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

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 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

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

It is based on the professional recommendations of the European Tube Association (ETA).

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## 1 Scope

This standard specifies a method for the determination of the thickness of the lacquer film applied inside cylindrical and conical aluminium tubes. The method is a reference. It can also be used as a reference when calibrating other electronic instruments suitable for determining coating weight thickness by e.g., capacitance measurement by Eddy current. It is applicable to aluminium tubes used for packing pharmaceutical, cosmetic, hygiene, food and other domestic products.

NOTE : Although not specified in this standard there are available suitable automatic film thickness measurement instruments that provide instantaneous results with good accuracy ( $< 1 \mu\text{m}$ ).

## 2 Normative references

This European 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 revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 12374, Packaging - Flexible Tubes – Terminology

## 3 Terms and definitions

For the purposes of this standard the terms and definitions in EN 12374 apply.

## 4 Principle

The measurement of the thickness of the lacquer film inside aluminium tubes with a micrometer or dial indicator after separation of the film from the aluminium tube and its enamel decoration by chemical means.

Through a chemical reaction the aluminium is dissolved and hydrogen gas is generated. The internal lacquer film remains intact.

## 5 Apparatus

### 5.1 Test measuring and other equipment

- a) Micrometer or dial indicator giving a precision of  $0,001 \text{ mm}$  ( $1 \mu\text{m}$ );
- b) Oven;
- c) Extract fan;
- d) Glass container of a size capable of containing a tube cut as in Figure 1;
- e) Scissors;
- f) Tweezers;
- g) Filter paper;
- h) Protective clothing and glasses.

## 5.2 Chemical Agents

- a) Solvent capable of dissolving the external enamel of the tubes;
- b) Sodium hydroxide with a concentration of 20 g of NaOH/100 ml.

NOTE Hydrochloric acid at a concentration of 10 g HCl/100 ml may be used instead of sodium hydroxide.

## 6 Method

### 6.1 Preliminary Precautions

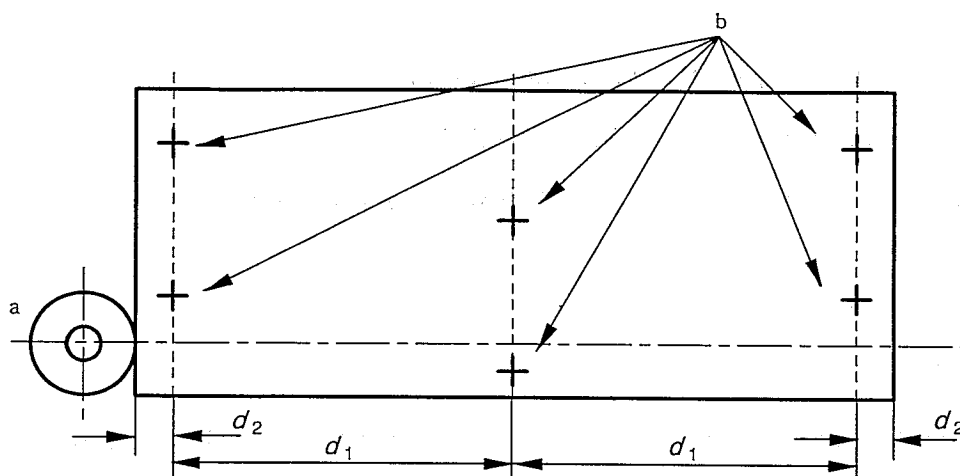
The preparation of samples requires the handling and use of hazardous materials. The corresponding legal regulations shall be observed.

### 6.2 Preparation of Samples

- a) Cut the tubes with the scissors as shown in Figure 1 (all measurements in mm).
- b) Dissolve the external enamel with the solvent.
- c) Pour NaOH solution into the container in a quantity sufficient to cover the tube.
- d) Place the container under the extract fan.
- e) Immerse the tube in the NaOH solution.
- f) With the tweezers remove the lacquer film and rinse with water.
- g) Dry the film between two sheets of filter paper. Then place the film in the oven for one hour at 80°C.

### 6.3 Measurement procedure

After cooling, the thickness of the lacquer film is measured at a temperature of between 10°C and 25°C with the micrometer. These measurements shall be taken at the different points indicated in Figure 1.



### Key

- a Head of tube  
b Measuring points  
 $d_1 = d_1$   
 $d_2 = 5 \text{ mm}$

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Figure 1 — Measuring points  
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## 7 Test report

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The report of the measurement shall contain the following information:

- Reference to this standard and if necessary a specification for the method of sampling and acceptance of the batch;
- The complete identification of the batch and of the tubes checked;
- The description and the dimensions of the samples;
- The registration number of the test instrument;
- The nature of the internal lacquer;
- The results of the film thickness at the different points of measurement;
- The number of samples checked;
- The number of defects. A defect is any tube with an internal lacquer film thickness that falls outside the specified or agreed limits (see 7a);
- If necessary, acceptance or refusal of the batch depending on the specifications (see 7a);
- All factors which could have affected the results or all operating details not specified in this standard;
- Date, place of test and name of tester.