BRITISH STANDARD

BS EN 13048:2009

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

ICS 55.120

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 13048:2009. It supersedes BS EN 13048:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PKW/0/-/10, Plastics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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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

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Contents Page

Foreword

This document (EN 13048:2009) 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of an identical text or by endorsement, at the latest by October 2009, and conflicting national standards shall be withdrawn at the latest by October 2009.

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 13048:2000.

It is based on the professional recommendations of the European Tube Manufacturers Association (ETMA)

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1 Scope

This document 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, e.g. by 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 (< 1μm).

2 Normative references

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

EN 12374:1998, *Packaging – Flexible Tubes – Terminology*

EN ISO 2360:2003, *Non-conductive coatings on non-magnetic electrically conductive basis materials – Measurement of coating thickness – Amplitude-sensitive eddy-current method (ISO 2360:2003)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12374:1998 and EN ISO 2360:2003 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 mm (1 μm);

b) Oven;

c) Extractor 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. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

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.

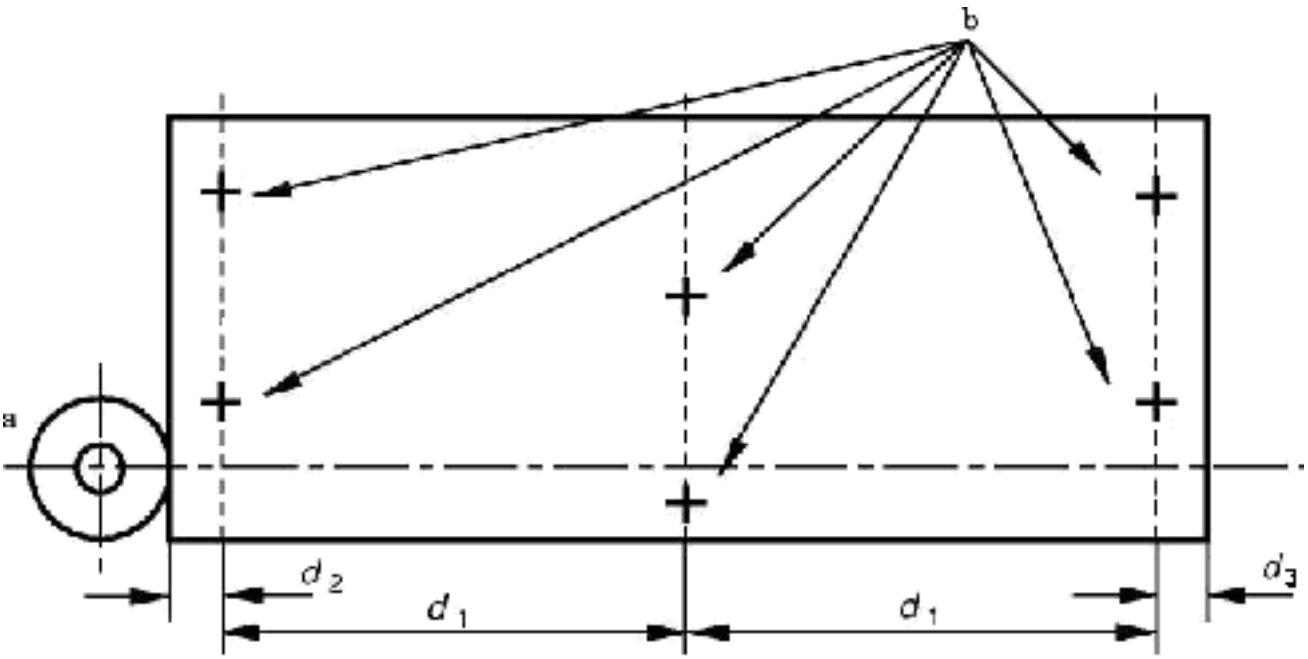
e) Immerse the tube in the NaOH solution.

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 1 h 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 - 10 mm
d_3 = 10 -20 mm

Figure 1 — Measuring points

7 Test report

The report of the measurement shall contain the following information:

a) reference to this standard and if necessary a specification for the method of sampling and acceptance of the batch;

b) complete identification of the batch and of the tubes checked;

c) description and dimensions of the samples;

d) identification of the test instrument;

e) nature of the internal lacquer;

f) results of the film thickness at the different points of measurement;

g) number of samples checked;

h) number of defects. A defect is any tube with an internal lacquer film thickness that falls outside the specified or agreed limits (see 7a);

i) if necessary, acceptance or refusal of the batch depending on the specifications (see 7a);

j) all factors which can have affected the results and which are not specified in this standard;

k) date, place of test and name of tester.

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