



**NSAI**  
Standards

Irish Standard  
I.S. EN 15384-2:2017

# Packaging - Test method to determine the porosity of the internal coating of flexible aluminium tubes - Part 2: Copper sulphate test

**I.S. EN 15384-2:2017**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN 15384-2:2017 is the adopted Irish version of the European Document EN 15384-2:2017, Packaging - Test method to determine the porosity of the internal coating of flexible aluminium tubes - Part 2: Copper sulphate test

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EUROPEAN STANDARD

EN 15384-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2017

ICS 55.120

Supersedes EN 15384:2007

English Version

**Packaging - Test method to determine the porosity of the  
internal coating of flexible aluminium tubes - Part 2:  
Copper sulphate test**

Emballage - Méthode d'essai pour déterminer la  
porosité du revêtement intérieur des tubes souples en  
aluminium - Partie 2 : Essai au sulfate de cuivre

Packmittel - Prüfverfahren zur Bestimmung der  
Porosität der Innenbeschichtung von Aluminiumtuben  
- Teil 2: Kupfersulfatverfahren

This European Standard was approved by CEN on 14 November 2016.

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.

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## **European foreword**

This document (EN 15384-2:2017) 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of an identical text or by endorsement, at the latest by July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

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

This document supersedes EN 15384:2007.

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

## EN 15384-2:2017 (E)

### 1 Scope

This European Standard is applicable for internally coated cylindrical aluminium tubes, mainly used for the packing of pharmaceutical, cosmetic, hygiene, food or other household products.

The internal coating is used as a barrier and should avoid any contact between aluminium and the product. This standard defines the copper sulphate method to detect the electrolyte conductivity as one criterion for the quality of the internal coating.

The electrolyte conductivity of the internal coating is only one criterion for evaluation of the quality of an internal coating. It does not give any information on the quantity or size of any pores or uncoated areas, nor any hint on possible reactions between the aluminium tube and the product. The electrolyte conductivity should never be used as the sole criterion for quality evaluation of the internal coating, but always with other parameters e.g. film thickness, acetone and/or ammonia resistance and of course results of enhanced stability studies.

### 2 Principle

The electrolyte conductivity of internally coated aluminium tubes is tested by an enamel conductometer. The aluminium tubes are filled with an electrolyte solution up to a fixed level at its open end. One electrode is connected to the tube nozzle, the second electrode is dipped into the solution. A defined voltage is applied for a fixed time. The induced current is a measure for the quality (pores and/or film thickness) of the internal coating.

### 3 Apparatus

#### 3.1 Enamel conductometer

#### 3.2 Moveable electrode

#### 3.3 Electrolyte

NOTE A schematic diagram of the test equipment is given in Figure 1.



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