



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 12460-5:2015

# Wood-based panels - Determination of formaldehyde release - Part 5: Extraction method (called the perforator method) (ISO 12460-5:2015)

**I.S. EN ISO 12460-5:2015**

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

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## National Foreword

I.S. EN ISO 12460-5:2015 is the adopted Irish version of the European Document EN ISO 12460-5:2015, Wood-based panels - Determination of formaldehyde release - Part 5: Extraction method (called the perforator method) (ISO 12460-5:2015)

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**EUROPEAN STANDARD**

**EN ISO 12460-5**

**NORME EUROPÉENNE**

**EUROPÄISCHE NORM**

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English Version

**Wood-based panels - Determination of formaldehyde  
release - Part 5: Extraction method (called the perforator  
method) (ISO 12460-5:2015)**

Panneaux à base de bois - Détermination du  
dégagement de formaldéhyde - Partie 5 : Méthode  
d'extraction (dite méthode au perforateur) (ISO  
12460-5:2015)

Holzwerkstoffe - Bestimmung der Formaldehydabgabe -  
Teil 5: Extraktionsverfahren (genannt  
Perforatormethode) (ISO 12460-5:2015)

This European Standard was approved by CEN on 29 August 2015.

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

**EN ISO 12460-5:2015 (E)**

<b>Contents</b>	<b>Page</b>
<b>European foreword.....</b>	<b>3</b>

## **European foreword**

This document (EN ISO 12460-5:2015) has been prepared by Technical Committee ISO/TC 89 “Wood-based panels” in collaboration with Technical Committee CEN/TC 112 “Wood-based panels” the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

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 120:1992.

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, Former Yugoslav Republic of Macedonia, 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.

### **Endorsement notice**

The text of ISO 12460-5:2015 has been approved by CEN as EN ISO 12460-5:2015 without any modification.

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# INTERNATIONAL STANDARD

**ISO  
12460-5**

Second edition  
2015-11-15

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## **Wood-based panels — Determination of formaldehyde release —**

### **Part 5: Extraction method (called the perforator method)**

*Panneaux à base de bois — Détermination du dégagement de  
formaldéhyde —*

*Partie 5: Méthode d'extraction (dite méthode au perforateur)*



Reference number  
ISO 12460-5:2015(E)

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**ISO 12460-5:2015(E)**



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## Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Principle</b> .....	<b>1</b>
<b>4 Reagents</b> .....	<b>1</b>
<b>5 Apparatus</b> .....	<b>1</b>
<b>6 Test pieces</b> .....	<b>3</b>
6.1 General.....	3
6.2 Sampling.....	3
6.3 Sampling for factory production control.....	3
6.4 Sampling for other purposes.....	3
<b>7 Procedure</b> .....	<b>3</b>
7.1 Number of extractions.....	3
7.2 Determination of moisture content.....	3
7.3 Extraction in the perforator.....	4
7.4 Blank test.....	4
7.5 Determination of formaldehyde in the extract.....	4
7.5.1 General.....	4
7.5.2 Principle.....	5
7.5.3 Reagents.....	5
7.5.4 Analytical procedure.....	5
7.5.5 Calibration curve.....	5
7.6 Quality assurance.....	6
<b>8 Expression of results</b> .....	<b>7</b>
8.1 Moisture content.....	7
8.2 Perforator value.....	7
<b>9 Test report</b> .....	<b>8</b>
<b>Annex A (normative) Perforator extraction efficiency test — Calibration of the perforator method</b> .....	<b>13</b>
<b>Bibliography</b> .....	<b>14</b>

## ISO 12460-5:2015(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 89, *Wood-based panels*.

This second edition cancels and replaces the first edition (ISO 12460-5:2011), which has been technically revised.

The objective of the revision was to improve the detection limit and the reproducibility of the method with regard to boards with low formaldehyde content.

Compared to ISO 12460-5:2011, the following modifications have been made:

- a) in [5.3](#) recommendation of cell length for low emitting samples is added;
- b) in [6.4](#) relative humidity for conditioning climate is increased to  $(65 \pm 5) \%$ ;
- c) in [7.1](#) and [8.2](#) procedure and evaluation of third extraction are modified;
- d) in [7.3](#) accuracy of weighing of test pieces enhanced and higher mass of the test pieces is added as an option for low emitting boards;
- e) in [7.4](#) precision of blank test is improved;
- f) in [7.5.1](#) fluorimetric determination of formaldehyde is added an option;
- g) in [7.5.4](#) temperature of water bath is increased to 60 °C;
- h) in [8.2](#) modification factors for moisture content is included;
- i) in [Figure 4](#) calibration curve is modified;
- j) [Annex A](#) for calibration and quality assurance is added.

ISO 12460 consists of the following parts, under the general title *Wood-based panels — Determination of formaldehyde release*:

— *Part 1: Formaldehyde emission by the 1-cubic-metre chamber method*

- *Part 3: Gas analysis method*
- *Part 4: Desiccator method*
- *Part 5: Extraction method (called the perforator method)*

Additional parts dealing with small-scale chamber method is planned.

## **ISO 12460-5:2015(E)**

### **Introduction**

The “perforator value” as determined by the method laid down in this part of ISO 12460 is considered to be the “formaldehyde content” of the tested board.

The test results are dependent on the specific board conditions at the time of testing.

The emission of formaldehyde from wood-based panels (e.g. particleboard, plywood, fibreboard, OSB) is a complex process. For a given board, the test result depends upon the age, ageing conditions, moisture content, etc., at the time of testing.

In addition, the correlation between the perforator value and the formaldehyde emission of the board depends on the type of board.

# Wood-based panels — Determination of formaldehyde release —

## Part 5: Extraction method (called the perforator method)

### 1 Scope

This part of ISO 12460 specifies an extraction method known as the “perforator method”. It is used for the determination of the formaldehyde content of unlaminated and uncoated wood-based panels.

### 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.

ISO 16979, *Wood-based panels — Determination of moisture content*

ISO 16999, *Wood-based panels — Sampling and cutting of test pieces*

### 3 Principle

The formaldehyde is extracted from test pieces by means of boiling toluene and then transferred into distilled or demineralized water. The formaldehyde content of this aqueous solution is determined photometrically by the acetylacetone method.

### 4 Reagents

For the analysis, only reagents of analytical quality and distilled or demineralized water shall be used.

**4.1 Toluene**, which is free from water and from impurities which may interfere with the test.

**4.2 Acetylacetone**, of analytical grade.

**4.3 Ammonium acetate**, of analytical grade.

**4.4 Formaldehyde solution**.

Commercially available formaldehyde solution (concentration typically between 35 % mass fraction to 40 % mass fraction).

### 5 Apparatus

**5.1 Precision balance**, with 0,01 g scale intervals.

**5.2 Well-ventilated oven**, capable of maintaining a temperature of  $(103 \pm 2) ^\circ\text{C}$ .

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