INTERNATIONAL STANDARD

ISO 12460-5

Second edition
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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
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Foreword

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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).

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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 ± 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.

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 ± 2) °C.