SVENSK STANDARD
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Träbaserade skivor – Bestämning av formaldehydinnehåll och emission –
Del 3: Gasanalysmetod (ISO 12460-3:2015)

Wood-based panels – Determination of formaldehyde release –
Part 3: Gas analysis method (ISO 12460-3:2015)

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Europastandarden EN ISO 12460-3:2015 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 12460-3:2015.

Denna standard ersätter SS-EN 717-2, utgåva 1 och SS-EN 717-2/AC:2002, utgåva 1.

The European Standard EN ISO 12460-3:2015 has the status of a Swedish Standard. This document contains the official English version of EN ISO 12460-3:2015.

This standard supersedes the Swedish Standard SS-EN 717-2, edition 1 and SS-EN 717-2/AC:2002, edition 1.

Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 12460-3:2015/
Relations to other parts under the same general title - Extract from the Foreword of ISO 12460-3:2015

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.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Träbaserade skivor, SIS/TK 182/AG 8.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 12460-3

November 2015

ICS 79.060.01

Supersedes EN 717-2:1994

English Version

Wood-based panels - Determination of formaldehyde release - Part 3: Gas analysis method (ISO 12460-3:2015)

Panneaux à base de bois - Détermination du dégagement de formaldéhyde - Partie 3: Méthode d'analyse de gaz (ISO 12460-3:2015)

Holzwerkstoffe - Bestimmung der Formaldehydabgabe - Teil 3: Gasanalyse-Verfahren (ISO 12460-3:2015)

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

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 COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 12460-3:2015) 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 May 2016, and conflicting national standards shall be withdrawn at the latest by May 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 717-2:1994.

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Endorsement notice

The text of ISO 12460-3:2015 has been approved by CEN as EN ISO 12460-3:2015 without any modification.

Wood-based panels — Determination of formaldehyde release —

Part 3: Gas analysis method

1 Scope

This part of ISO 12460 specifies a procedure for determination of accelerated formaldehyde release from uncoated and coated wood-based panels using the gas analysis method. The procedure is also suitable for the testing of other materials (e.g. edge bands, floor coverings, foams, foils, laminated wood products, veneered wood products, coated wood products).

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

A test piece of known surface area is placed in a closed chamber in which the temperature, humidity, airflow, and pressure are controlled to defined values. Formaldehyde released from the test pieces mixes with the air in the chamber. This air is continually drawn from the chamber and passes through gas wash bottles, containing water, which absorbs the released formaldehyde. At the end of the test, the formaldehyde concentration is determined photometrically or fluorimetrically. The formaldehyde release is calculated from this concentration, the sampling time, and the exposed area of the test pieces and is expressed in milligrams per square meter and hour (mg/m^2h).

4 Reagents

Reagents of recognized analytical purity and distilled or demineralised water (referred throughout the following text as distilled water) shall be used for the analysis.

4.1 4 ml Acetylacetone solution are added to a 1 000 ml volumetric flask and made up to the mark with distilled water.

4.2 200 g ammonium acetate solution are dissolved with distilled water in a 1 000 ml volumetric flask and made up to the mark.

Optionally, a premixed reagent of acetylacetone and ammonium acetate as described in ISO 12460-4 can be used.

4.3 Formaldehyde solution commercially available (concentration typically between 35 % mass fraction to 40 % mass fraction).

4.4 Standard iodine solution $c(I_2)$ = 0,05 mol/l

4.5 Standard sodium thiosulphate solution $c(Na_2S_2O_3)$ = 0,1 mol/l

4.6 Standard sodium hydroxide solution $c(NaOH)$ = 1 mol/l

4.7 Standard sulphuric acid solution $c(H_2SO_4)$ = 1 mol/l

4.8 Starch solution 1 % by mass

5 Apparatus

5.1 Main composites of test apparatus (see Figure 1)

5.1.1 Air filter (1).

5.1.2 Wash bottle, 500 ml, containing ca. 400 ml distilled water (2).

5.1.3 Desiccator, 500 ml, containing silica gel (3).

5.1.4 Air pump (4).

5.1.5 Needle valve (5).

5.1.6 Equipment for measuring rate of air flow through apparatus (6).

5.1.7 Test chamber (diameter: 90 mm to 100 mm with a length which gives an internal volume of (4 000 ± 200) ml with double casing of stainless steel or glass (7).

5.1.8 Heating equipment for air (e.g. copper coil inside the double casing) (8).

5.1.9 Thermostat (9).

5.1.10 Magnetic valves (10).

5.1.11 4 pairs of gas wash bottles, 100 ml or optionally, 4 pairs of gas wash bottles, 30 ml (21).

5.1.12 Pressure monitor (22).

5.1.13 Temperature monitor (23).

5.1.14 Test piece holder, constructed as a shelf with three rods made from stainless steel or another inert material (24).

NOTE The test apparatus described in Figure 1 is based on a waterborne heating system. A test apparatus with an electrical heating system can be used optionally.

5.2 Laboratory equipment

5.2.1 Ventilated oven, as described in ISO 16979 for determination of moisture content (if requested).

5.2.2 Spectrophotometer, with cells of 50 mm optical path length and capable of measuring absorbance at 412 mm.

5.2.3 Water bath, capable of maintaining a temperature of (60 ± 1) °C.

5.2.4 Water bath, capable of maintaining a temperature in the range of 20 °C to 25 °C.

5.2.5 Six volumetric flasks, 100 ml (calibrated at 20 °C).

5.2.6 Four volumetric flasks, 250 ml or optionally, four volumetric flasks, 100 ml (calibrated at 20 °C).

5.2.7 two volumetric flasks, 1 000 ml (calibrated at 20 °C).

5.2.8 Volumetric pipettes (calibrated at 20 °C), 1 ml, 2 ml, 5 ml, 10 ml, 15 ml, 20 ml, 25 ml, 50 ml, 100 ml.

5.2.9 Six flasks, 50 ml (with stoppers).

5.2.10 Microburette.

5.2.11 Burette, 50 ml, graduated (calibrated at 20 °C).

5.2.12 Balance, capable of measuring to 0,00 1 g.

6 Sampling and preparation of test pieces

6.1 Preparation of test pieces

Three test pieces, each with the dimensions of (400 ± 1) mm × (50 ± 1) mm × board thickness, shall be prepared for the determination of formaldehyde release giving a total emitting surface area of 0,04 m^2.

If the sample available does not allow the preparation of test pieces of the specified dimension, then the combined emitting surface area of the test pieces(s) should be as close as possible to 0,04 m^2.

For testing layer glued materials (e.g. plywood, veneered particleboard), specimens shall be cut from the respective panel with the fibre direction of the faces perpendicular to the longitudinal axis of the specimen.

Each test piece has to be hermetically wrapped immediately after cutting and stored at ambient temperature.

Before testing, each test piece shall be stored hermetically wrapped at least one day at ambient temperature in order to improve the repeatability. For factory production control with hot test pieces, a valid correlation has to be established.

For testing, the test pieces shall be edge sealed with temperature resistant (i.e. ≥60 °C) self-adhesive aluminium tape or an alternative sealing method if equivalence has been demonstrated. The emitting (unsealed) surface area of the sealed test piece has to be measured and calculated in square metres (m^2).

6.2 Selection of test pieces for factory production control

Sampling and cutting of the test pieces shall be performed according to the principles of ISO 16999.

Test pieces are taken, uniformly distributed over the width of the (cooled) board, but excluding a 250 mm wide strip from the end of each board.

The formaldehyde determination should be carried out not more than 72 h after sampling.