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Wood flooring and wood panelling and cladding — Determination of the resistance to chemical agents

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee B/543, Round and sawn timber.

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

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Wood flooring and wood panelling and cladding - Determination of the resistance to chemical agents

Planchers en bois et lambris et bardages en bois - Détermination de la résistance aux agents chimiques

Holzfußböden und Wand- und Deckenbekleidungen aus Holz - Bestimmung der chemischen Widerstandsfähigkeit

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Foreword

This document (EN 13442:2013) has been prepared by Technical Committee CEN/TC 175 “Round and sawn timber”, 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of an identical text or by endorsement, at the latest by September 2013 and conflicting national standards shall be withdrawn at the latest by September 2013.

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 13442:2002.

The following modifications have been made:

— 6.1.2, light sources has been modified;

— Table 1, test agent has been modified;

— A new Annex A has been added.

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Introduction

This standard is one of a series of standards about wood in flooring (including parquet) and wood panelling and cladding.

1 Scope

This European Standard specifies a test method to determine the resistance of the surface of an element of wood flooring, panelling and cladding, to a predetermined list of chemical agents they may be exposed to during their service life.

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.

EN 13756:2002, *Wood flooring – Terminology*

EN ISO 3668, *Paints and varnishes – Visual comparison of the colour of paints (ISO 3668)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13756:2002 and the following apply.

3.1
test piece
part, of a size suitable for testing, taken from an element

3.2
test specimen
either a full element or an assembly of elements to be tested

3.3
test surface
part of the test piece, where the test area is located

Note 1 to entry: For products made from small elements the test piece can be the same as the test specimen.

3.4
test area
area under the Petri dish

3.5
reference area
any unexposed surface of the test specimen close to the test area but outside the Petri dish

4 Principle

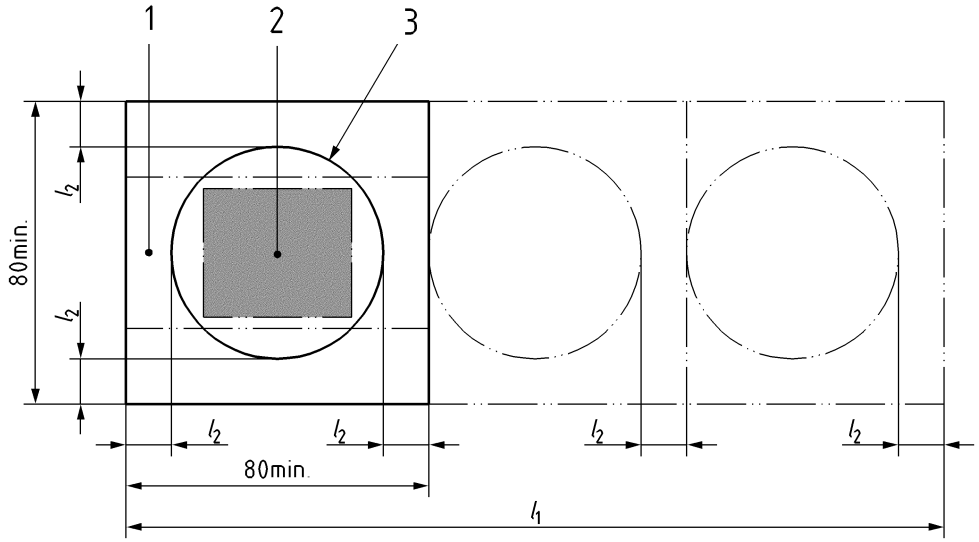
Application of a liquid test agent to a surface by means of saturated paper, covered by a glass Petri dish. After a specified period of time, removal of the paper, washing and drying of the surface and examination for visible change. Assessment of the test results in terms of a numerical rating code.

5 Test pieces and test specimens

5.1 Dimensions

A test piece shall have a minimum size of 80 mm by 80 mm by the thickness of the element, see Figure 1.

Dimensions in millimetres



Key

1 test surface

2 test area

3 Petri dish

l_1 ≥ 80 + 60(n - 1), minimum distance between the edge and the next test area(s) according to the number of test areas

l_2 20 mm, minimum distance between any test area and the edge or another test area

n number of test areas

Figure 1 — Dimensions of a test piece

If the size of the element delivered by the manufacturer does not allow the cutting of a test piece, a test specimen shall be assembled in accordance with the manufacturer's specification, which allows to cut the necessary test pieces.

5.2 Sampling

Three test pieces or test specimens shall be tested for each agent to be applied.

6 Equipment and materials

6.1 Apparatus

6.1.1 Conditioning

If a conditioning system is available, the following climate shall be used:

— temperature (23 ± 2) °C ;

— relative humidity (50 ± 5) % .

6.1.2 Light sources

The following types of lights are considered: diffused light source and direct light source.

6.1.2.1 Diffused light source

This source provides evenly diffused light, giving an illumination on the test area of between 2 000 lx and 5 000 lx.

The light source shall have a correlated colour temperature of (6 500 ± 50) K and an R_a (the indication of depiction of colours) greater than 92, by using a colour matching booth in accordance with EN ISO 3668.

6.1.2.2 Direct light source.

This source may be used in addition to the diffused light source. It is described in Annex A.

NOTE This source may give different information than the diffused light source for specific applications.

6.2 Test equipment

6.2.1 Pieces of cellulose filter paper to apply each of the test agents, free of dyes and of chemicals, with a grammage of 400 g/m2 to 500 g/m2.

They shall have an area of (500 ± 50) mm^2. Their shape shall be chosen to suit the surface of a small element or a small single parquet strip without overlapping the edges of the element or parquet strip to be tested.

6.2.2 Glass Petri dish.

6.2.3 Pair of tweezers.

6.2.4 Absorbent paper or tissue, with good absorbent properties, free of dyes and of chemicals.

6.2.5 White, soft, absorbent cotton cloths.

6.2.6 Vessels for containing test agents during soaking of filter paper.

6.3 Chemical agents

6.3.1 Test agents

The test agents are listed in Table 1.

Table 1 — Test agents

Agent	**Initial temperature of the agent ± 5 °C °C**	**Duration**
Distilled water (see 6.3.2.1)	20	(24 ± 1) h
Detergent (see 6.3.2.2)	20	(24 ± 1) h
Acetone, purity grade min. mass fraction of 99,5 %	20	(120 ± 10) s
Ethanol, chemical pure, not denaturated, mass fraction of 50 % in distilled water	20	(24 ± 1) h
Plain red wine, alcohol with a volume fraction of 10 % to 12 %	20	(24 ± 1) h
Red wine vinegar, acetic acid solution with a volume fraction of 3 % to 5 %	20	(24 ± 1) h
Olive oil	20	(24 ± 1) h
Cow's milk[a] , mass fraction of 3 % to 5 % fat	20	(24 ± 1) h
Coffee[a], 40 g instant, freeze-dried coffee per l of boiling water	80	(24 ± 1) h
Black tea, 10 g of tea leaves is infused with 1 l of boiling water. Tea is allowed to draw for 5 min.	80	(24 ± 1) h
Ammonia solution[b] at 10 % in water	20	(8 ± 1) h
Blue/black ink	20	(24 ± 1) h
[a] The test agents cow's milk, coffee and tea can be used only for four hours. [b] The ammonia solution can be used only for one month.		

The test agents shall be stored in sealed glass bottles in a dark place and shall be conditioned to the test temperature prior to use. Cow's milk, coffee, tea and wine shall be fresh.

6.3.2 Cleansing agents

6.3.2.1 Distilled water, not only deionised.

6.3.2.2 House keeping detergent, of the following composition:

a) a mass fraction of 12,5 % of a sodium -1-alkyl-arylsulphonate, where alkyl is a linear 12-14 C alkyl group;

b) a mass fraction of 12,5 % polyethoxylated derivates of primary or secondary (C_8 - C_{16}) alcohols with 5 to 15 ethoxylated groups having a cloud point of 25 °C to 75 °C in 1 % by weight aqueous solution (determination of cloud point is described in ISO 1065);

c) a mass fraction of 5 % ethanol, chemical pure, not denaturated, minimum mass fraction of 96 %;

d) a mass fraction of 70 % water (see 6.3.2.1).

The house keeping detergent shall be stored in a glass bottle in a cool dark place and should be used within 1 year of the day of preparation.

6.3.2.3 Cleansing solution containing 15 ml/l of the house keeping detergent (see 6.3.2.2) in water (see 6.3.2.1).

This solution shall be freshly prepared on each occasion.

7 Procedure

7.1 Test pieces and test specimen

If the test piece or test specimen is coated, carry out the test after full curing of the coating. Relevant information shall be provided by the manufacturer.

Wipe the test surface carefully with a dry cloth (see 6.2.5) before testing.

7.2 Chemical test

Immediately after the conditioning, if any, carry out the test in an atmosphere of (23 ± 2) °C.

Place the test surface horizontally. Test it with the test agents specified in 6.3.1 at test areas, their centre being not more and not less than 60 mm apart, centre to centre and not less than 40 mm from any edge of the test surface.

Immerse a piece of filter paper (see 6.2.1) into a test agent (see 6.3.1) for (30 ± 1) s, lift with the pair of tweezers (see 6.2.3) and wipe off against the edge of the vessel (see 6.2.6). Quickly place the filter paper on the test area and immediately cover with an inverted glass Petri dish (see 6.2.2). The filter paper shall not touch the edge of the glass Petri dish.

Record the position of each impregnated paper on each test area for each test agent.

After the stated duration for each test agent used (see 6.3.1), remove the glass Petri dish and lift off the filter paper with the pair of tweezers. Do not remove fibres of paper adhering to the test area. Soak up any remaining test agent with the absorbent paper (see 6.2.4) without rubbing and leave the test surface undisturbed for 16 h to 24 h in the test atmosphere without covering it. The test area shall be sufficiently protected against dust without limiting in any way the free access of air.

After the expiry of the 16 h to 24 h, wash the test surface by lightly rubbing it with the absorbent paper or tissue (see 6.2.4) soaked in cleansing solution (see 6.3.2.3) and then with another absorbent paper or tissue soaked in distilled water (see 6.3.2.1). Finally wipe the surface carefully with a dry cloth (see 6.2.5).

At the same time, wash and dry the same way a reference area on the test surface that has not been exposed to the test agent.

Leave the test surface undisturbed, without covering it, for (30 ± 1) min in the test atmosphere, then proceed to the examination (see Clause 8).

8 Examination of the test piece

8.1 Rating code

Rate the test area by comparison with the reference area for each test agent according to the following numerical rating code:

5 No visible changes (no damage).

4 Slight change in gloss level and colour visible only when the light source is mirrored in the test surface on or quite near the mark and is reflected towards the observer's eye, or a few isolated marks just visible.

3 Slight mark, visible in several viewing directions; for example, almost the complete shape of the filter paper is just visible.

2 Strong mark, the structure of the surface being however largely unchanged.

1 Strong mark, the structure of the surface being changed or the surface material being totally or partially removed or the filter paper adhering to the surface.

If other notable changes are at hand, this shall be reported.

8.2 Procedure

Carefully examine the test area for damage, e.g. discolouration, change in gloss and colour, blistering and other defects. For this purpose, illuminate the surface separately using each of the two light sources (see 6.1.2.1 and 6.1.2.2) and examine from different angles, including angle combinations such that the light is reflected from the test surface and towards the observer’s eye. Viewing distance shall be 0,25 m to 1,0 m.

Place the test piece in different positions with the light parallel and perpendicular to the direction of the grain, if any. In each position, compare the test area with the surface of the reference area.

Rate the test area according to 8.1.

9 Expression of results

9.1 For each test area

It is recommended that each test area be rated by more than one observer experienced in this type of assessment. The reported rating for the test area shall be the average value given by the observer.

9.2 For each test agent

The mean value of the three test pieces for each test agent shall be calculated with two significant figures.

9.3 For the whole test

The sum of all mean values is the result of the whole test.

The result obtained with the two light sources shall be registered in the test report.

10 Test report

The test report shall contain at least the following information:

a) a reference to this standard and the deviations, if any;

b) the name and the address of the laboratory;

c) the name and the address of the manufacturer/supplier;

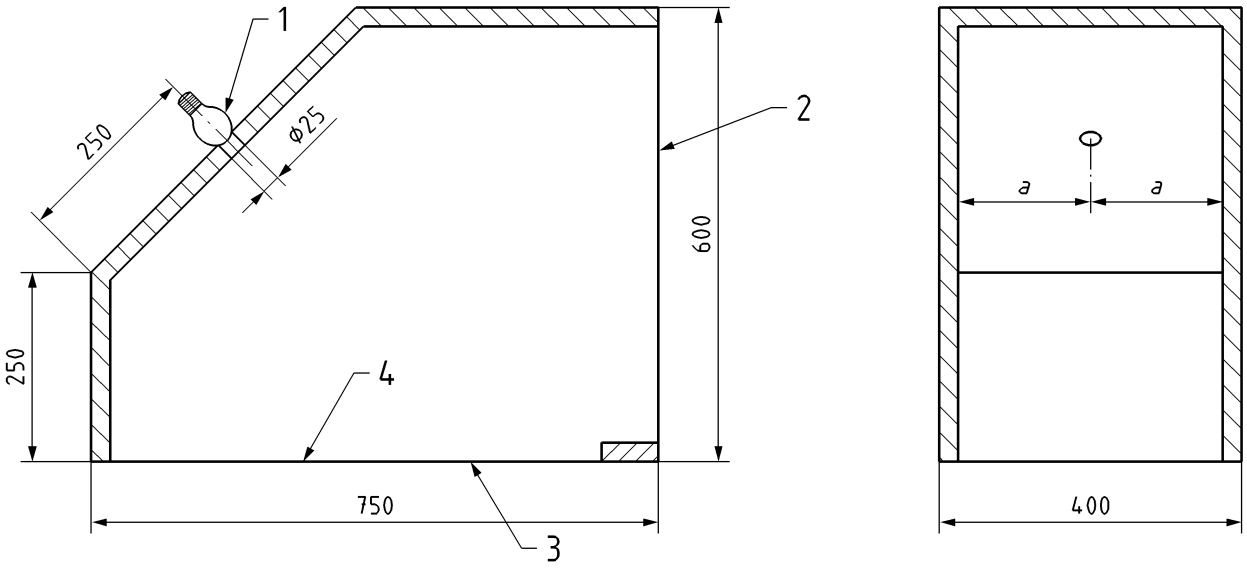
d) the type (the brand, if any) and the full description of the elements, lay up, coating, appearance, classification, etc.;

e) the conditioning applied to the test pieces prior to testing;

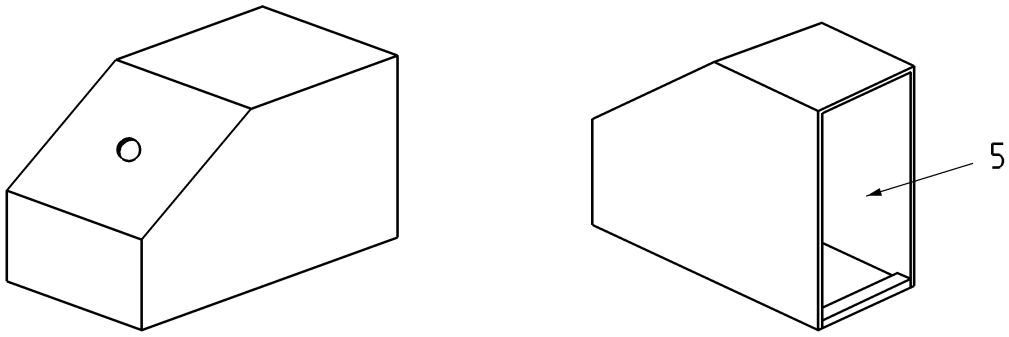
f) the climatic conditions within the laboratory during the testing;

g) the test result for each test agent, as described in 9.2, and the test result for chosen light source, as described in 9.3.

Dimensions in millimetres



a)



b)

Key

1 60 W frosted bulb
2 open end
3 open bottom
4 observation area
5 viewing direction

NOTE Interior surfaces are black. All dimensions are approximate.

Figure 2 — Viewing cabinet

Annex A
(informative)

Direct light source

Direct light source, 60 W frosted bulb so screened that light reaches the test area only from the bulb and that the bulb is not in direct view of the tester. The angle between the horizontal and a line between the bulb and the area under examination shall be 30° to 60°.

NOTE These conditions are fulfilled when the direct source is placed in a viewing cabinet as shown in Figure 2.

Bibliography

[1] ISO 1065, *Non-ionic surface-active agents obtained from ethylene oxide and mixed non-ionic surface-active agents – Determination of cloud point*

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