

## **Möbler – Bedömning av ytors ljushärdighet**

## **Furniture – Assessment of the effect of light exposure**

Europastandarden EN 15187:2006 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 15187:2006.

The European Standard EN 15187:2006 has the status of a Swedish Standard. This document contains the official English version of EN 15187:2006.

---

Uppllysningar 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.

*Postadress:* SIS Förlag AB, 118 80 STOCKHOLM  
*Telefon:* 08 - 555 523 10. *Telefax:* 08 - 555 523 11  
*E-post:* sis.sales@sis.se. *Internet:* www.sis.se

EUROPEAN STANDARD

**EN 15187**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2006

---

ICS 97.140

English Version

## Furniture - Assessment of the effect of light exposure

Ameublement - Évaluation de la tenue de la surface à la  
lumière

Möbel - Bestimmung der Lichtbeständigkeit von  
Oberflächen

This European Standard was approved by CEN on 28 August 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

---

<b>Contents</b>		<b>Page</b>
Foreword.....		3
1 Scope .....		4
2 Normative references .....		4
3 Terms and definitions .....		5
4 Principle.....		5
4.1 General.....		5
4.2 Choice of methods.....		5
5 Apparatus and materials.....		5
5.1 Apparatus with humidity control.....		5
5.2 Apparatus without humidity control.....		6
5.3 Conditioning chamber.....		6
5.4 Cleaning cloth .....		6
5.5 Aluminium foil .....		6
5.6 Blue wool scale .....		6
6 Preparation and conditioning.....		7
6.1 Storing and conditioning .....		7
6.2 Test surface.....		7
7 Procedure .....		8
7.1 Preparation of test surface .....		8
7.2 Exposure.....		9
7.3 Duration .....		9
8 Assessment of results .....		9
9 Test report .....		10
Bibliography .....		11

## **Foreword**

This document (EN 15187:2006) has been prepared by Technical Committee CEN/TC 207 "Furniture", the secretariat of which is held by UNI.

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 April 2007, and conflicting national standards shall be withdrawn at the latest by April 2007.

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

**EN 15187:2006 (E)****1 Scope**

This European standard specifies a method for the assessment of the effects of light in indoor conditions, by exposure to artificial radiation and applies to rigid surfaces of all finished products regardless of material.

It does not apply to finishes on leather and fabrics.

The test is intended to be carried out on a part of the finished furniture, but can be carried out on test panels of the same material, finished in an identical manner to the finished product, and of a size sufficient to meet the requirements of the test.

The test should be carried out on unused surfaces.

This standard describes the most important parameters, such as the colour change when a surface is exposed and specifies the conditions to be used in the exposure apparatus.

The light resistance of a surface can be assessed by using two apparatus as specified in clause 4, one as a reference test method, and the other for in-company testing.

**2 Normative references**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 105-B02:1999, *Textiles – Tests for Colour fastness – Part B02: Colour fastness to artificial light: Xenon arc fading lamp test (ISO 105-B02:1994, including Amendment 1:1998)*

EN ISO 4892-1, *Plastics – Methods of exposure to laboratory light sources – Part 1: General guidance (ISO 4892-1:1999)*

EN ISO 4892-2, *Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc lamps (ISO 4892-2:2006)*

EN ISO 11341:2004, *Paints and varnishes – Artificial weathering and exposure to artificial radiation – Exposure to filtered xenon-arc radiation (ISO 11341:2004)*

ISO 105-A02:1993, *Textiles – Tests for Colour fastness – Part A02: Grey scale for assessing change in colour*

### 3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

#### 3.1

##### **test panel**

panel including the test surface (see 3.2)

NOTE It may be cut from a finished item of furniture or it may be a separate panel produced in the same manner as the finished item of furniture

#### 3.2

##### **test surface**

part of the test panel including an exposed as well as a control section (see Figure 1.a and 1.b)

#### 3.3

##### **test atmosphere**

atmosphere where the test is carried out

### 4 Principle

#### 4.1 General

Accelerated exposure to light of furniture surfaces to filtered xenon-arc radiation is carried out in order to assess the behaviour of the surface area and the degree of colour change. The properties of the surfaces exposed are compared with those of masked, unexposed sections from the same test surface.

#### 4.2 Choice of methods

The apparatus described in clause 5.1 shall be used as a reference method in cases where the influence of humidity cannot be excluded.

The apparatus described in clause 5.2 can be used for in-company testing in cases where the influence of humidity can be excluded.

### 5 Apparatus and materials

#### 5.1 Apparatus with humidity control

A test device as specified in EN ISO 4892-1 and EN ISO 4892-2 with xenon lamp and test parameters, as specified in Table 1.

**EN 15187:2006 (E)****Table 1 – General conditions for the apparatus with humidity control**

Source	Xenon Lamp
Irradiance	EN ISO 11341:2004 Table 2
Control irradiance	50W/m <sup>2</sup> for the wavelength range 300 nm to 400 nm for air cooled Xenon Arc Lamps or 1,25 W/m <sup>2</sup> at 420 nm for water cooled Xenon Arc Lamp, see EN ISO 4892-2, with a recalibration of the reference radiometer or calibrated lamp according to the manufacturer
Test atmosphere	Black Standard Temperature (BST): (55 ± 2) °C RH = (50 ± 10) %, see EN ISO 4892-2

**5.2 Apparatus without humidity control**

A test device as specified in EN ISO 4892-1 and EN ISO 4892-2 with xenon lamp and test parameters, as specified in Table 2.

**Table 2 – General conditions for the apparatus without humidity control**

Source	Xenon Lamp
Irradiance	EN ISO 11341:2004 Table 2
Control irradiance	550W/m <sup>2</sup> between 300 nm to 800 nm
Test atmosphere	Black Standard Temperature (BST): (55 ± 2) °C

**5.3 Conditioning chamber**

A chamber with a standard atmosphere of (23 ± 2) °C, relative humidity (50 ± 5) %.

**5.4 Cleaning cloth**

White soft absorbent cloth.

**5.5 Aluminium foil**

Aluminium foil with a thickness of at least 0,03 mm.

**5.6 Blue wool scale**

Blue wool scale according to EN ISO 105-B02:1999, 4.1.1.



## 6 Preparation and conditioning

### 6.1 Storing and conditioning

The test panel shall be kept without direct exposure to light.

The test panel shall be stored for not less than four weeks at a temperature not less than 15°C and not more than 30°C with free circulation of air.

Conditioning of the test surface shall begin one week before testing and shall be carried out in air at a temperature of  $(23 \pm 2)^\circ\text{C}$  and a relative humidity of  $(50 \pm 5)\%$ .

NOTE The conditioning can be a part of the above four weeks.

### 6.2 Test surface

One test surface shall be prepared.

The test surface shall be substantially flat.

The test surface shall be taken at least 20 mm from the edge (see Figure 1.a).

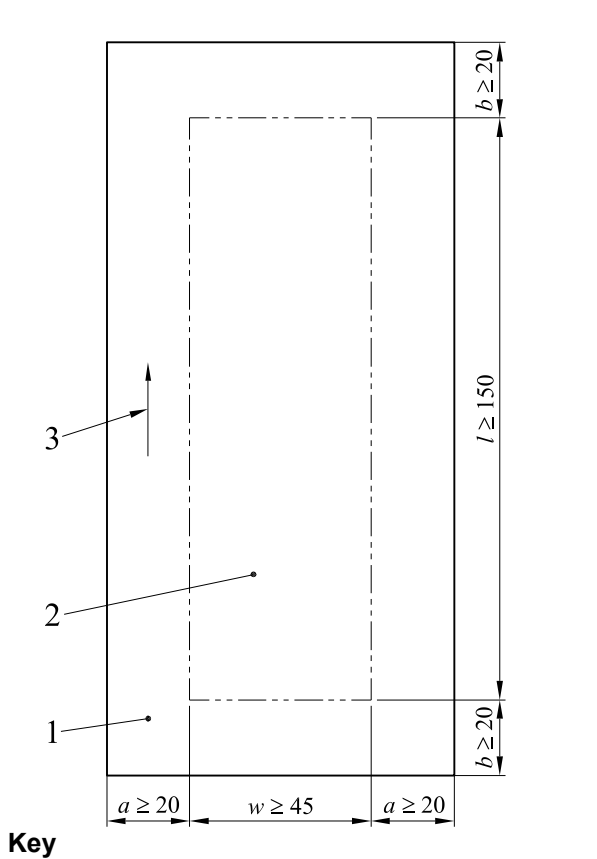
The minimum size of the test surface is 150 mm x 45 mm (see Figure 1.b).

The test surface shall be carefully wiped with a cleaning cloth, see clause 5.4, before the test.

## EN 15187:2006 (E)

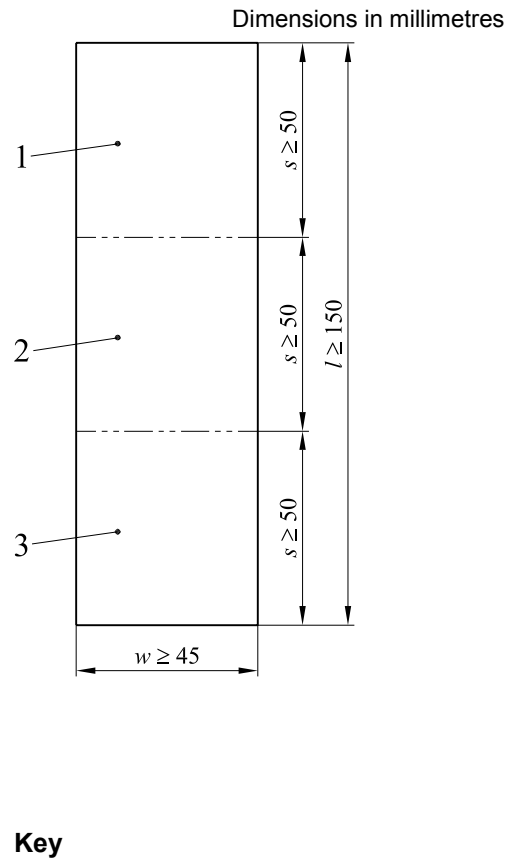
## 7 Procedure

## 7.1 Preparation of test surface



- 1 test panel
- 2 test surface
- 3 direction of the grain
- l length of the test surface
- w width of the test surface
- a distance between the edge of the test panel and the longest side of the test surface
- b distance between the edge of the test panel and the shortest side of the test surface

**Figure 1.a) — Test panel — Instruction for cutting of the test surface**



- 1 section 1: control section (masked)
- 2 section 2: exposed section
- 3 section 3: control section (to be separated)
- l length of the test surface
- s length of the section (the three sections have the same length)
- w width of the test surface

**Figure 1.b) — Test surface**

Cut off section 3 according to Figure 1.b and keep it outside the apparatus, in a place without direct light.

Part of the set of blue wool reference and the control section of the test surface (see Figure 1.b, section 1) shall be masked by aluminium foil, according to Figure 1.b, with the high gloss side facing the lamp. This foil shall not be glued to the surface to be exposed. The foil shall be firmly fixed on the reverse side in order to clearly differentiate between the two zones of the test surface.

## 7.2 Exposure

Place the test surface sections 1 and 2 inside the apparatus, and start the exposure.

## 7.3 Duration

Discontinue the exposure when the contrast between the exposed and unexposed sections of the blue wool reference 6 is equal to grade 4 on the grey scale, as defined in ISO 105-A02.

NOTE 1 If necessary, a spectrophotometer can be used, in which case the colour difference  $\Delta E^* = 1,7 \pm 0,3$ , is when grey scale grade 4 is reached.

NOTE 2 Although the use of blue wool references is no longer the preferred method of measuring radiant exposure (see EN ISO 4892-2), and blue wool standards are no longer commercially available in some countries, the method is still in common use. Once sufficient data has been collected, the end-point of the test will be defined by the level of radiant exposure.

NOTE 3 The laboratory can use a set of blue wool reference 1 to 8 or blue wool references 5, 6, 7 only. Blue wool references 5 and 7 are included to provide confirmation that blue wool references 6 has degraded to the specified degree of contrast.

## 8 Assessment of results

Immediately after the exposure phase, the test surface shall be kept in the conditioning atmosphere in an area without direct light exposure.

After one day and before three days, simultaneously assess the contrast and the colour change using a Day-Light Cabinet with a D65 illuminant source according to the ISO 10526, as follows:

Each test surface shall be rated by an experienced observer. In cases of a dispute, three observers shall be required. All observers shall have good colour vision.

Viewing distance shall be from 0,25 m to 1,00 m.

Compare the two control sections (see Figure 1.b, sections 1 and 3). If they are identical, the results shall be taken from the tested sample (see Figure 1.b, sections 1 and 2).

If they are not identical, the result shall be taken from the exposed section and the untested control section (see Figure 1.b, sections 2 and 3).

Assess the colour change of the test surface by examining the colour change between the exposed and non-exposed sections of the test surface and by comparison to the grey scale (9 step scale according to the ISO 105-A02). In case of three observers, the reported rating for the test surface shall be averaged to the nearest nominal value.

Express the result in relation to the resistance to light of Blue wool standard No. 6 as shown in Table 3.

**Table 3 — Resistance to light**

Test rating	Resistance to light
Grey scale	Blue wool Standard No.6
> 4	> 6
4	6
< 4	< 6

**EN 15187:2006 (E)**

NOTE 1 In case of plain colours (only one colour, without pattern or colour combinations), a colour measurement according to ISO 7724-2 is also permitted. If this additional measurement is carried out, the result and the equipment should be reported.

NOTE 2 If it is desired to record the character of the change in colour of the test area, appropriate qualitative terms may be added as explained in Table 1 of ISO 105-A02:1993.

**9 Test report**

The test report shall include at least the following information:

- a) reference to this European Standard;
- b) description of the test panel including relevant data (wherever possible the substrate and the finishing system shall be identified, age of the test panels, etc);
- c) number of replicates if more than one;
- d) type of exposure apparatus used;
- e) method of assessment of blue wool scale;
- f) number of observers;
- g) control section used for assessment (section 1 or 3);
- h) colour change expressed according to the grey scale level (e.g. 5 or 4/5) at blue wool N°6 and optional the character of colour change;
- i) resistance to light;
- j) result and type of geometry of the equipment if a colour measurement is carried out;
- k) any deviations from this European standard;
- l) name and address of the test facility;
- m) date of the test.

## Bibliography

- [1] ISO 7724-2:1984, *Paints and varnishes - Colorimetry - Part 2: Colour measurement*
- [2] ISO 10526:1999, *CIE Standard illuminants for colorimetry*