



**SLOVENSKI STANDARD**  
**SIST EN 12705:2000**  
**01-december-2000**

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**Lepila za usnje in obutvene materiale - Ugotavljanje spremembe barve belih ali svetlo obarvanih usnjenih površin zaradi migracije**

Adhesives for leather and footwear materials - Determination of colour change of white or bright coloured leather surfaces by migration

Klebstoffe für Leder und Schuhwerkstoffe - Bestimmung der Farbänderung weißer oder hellfarbiger Lederoberflächen durch Migration

Adhésifs pour le cuir et les matériaux de chaussures - Détermination du changement de teinte par migration des surfaces de cuir blanc ou de couleurs claires

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**Ta slovenski standard je istoveten z: EN 12705:1999**

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**ICS:**

61.060	Obuvala	Footwear
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 12705

November 1999

ICS 83.180

English version

Adhesives for leather and footwear materials - Determination of  
colour change of white or bright coloured leather surfaces by  
migration

Adhésifs pour le cuir et les matériaux de chaussures -  
Détermination du changement de teinte par migration des  
surfaces de cuir blanc ou de couleurs claires

Klebstoffe für Leder und Schuhwerkstoffe - Bestimmung  
der Farbänderung weißer oder hellfarbiger  
Lederoberflächen durch Migration

This European Standard was approved by CEN on 30 September 1999.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 193 "Adhesives", the secretariat of which is held by AENOR.

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 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

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

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## 1 Scope

This European Standard specifies a method to determine the colour change of white or bright coloured leather surfaces caused by adhesives and/or their basic constituents migrating from the reverse sides to their upper surfaces.

This change of colour may be caused either by the adhesive directly or by adhesive coatings on materials used in footwear manufacture, e.g. adhesive coated linings for ironing, toe-puffs, reinforcing tapes or bonded materials.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 923, *Adhesives — Terms and definitions*

EN 1066, *Adhesives — Sampling*

EN 1067, *Adhesives — Examination and preparation of samples for testing*

EN 1244, *Adhesives — Determination of the colour and/or colour changes of adhesive coats under the influence of light*

ISO 2602, *Statistical interpretation of test results — Estimation of the mean — Confidence interval*

CIE 15.2, *Colorimetry*

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## 3 Terms and definitions

For the purposes of this standard, the following terms and definitions, together with those given in EN 923, apply:

### 3.1

#### **leather**

tanned animal skin, usually free of hair

### 3.2

#### **colour**

sensation perceived by the human eye

## 4 Principle

The bonding adhesive is coated on the reverse side of the leather under test and allowed to dry, to cool or to set for specified period of time.

The colour of the upper side of the leather is measured and the test specimen is stored under specified conditions. The colour of the test specimen is measured after storage.

## 5 Safety

Persons using this standard shall be familiar with normal laboratory practice.

This standard does not purport to address all the safety problems, if any, associated with its use.

It is responsibility of the user to establish health and safety practices and to ensure compliance with any European and national regulatory conditions.

## 6 Apparatus and materials

Ordinary laboratory apparatus and in particular:

**6.1 Cutting knife**, for cutting leather.

**6.2 Coating device**, to spread the adhesive to be used on the pieces of leather to be tested, capable of producing a flat surface coating with a measurable uniform thickness after drying, cooling or setting.

**6.3 Analytical balance**, with scale division of 0,001 g for weighing test pieces.

**6.4 Glass plates**, even and smooth at least 70 mm x 70 mm with a mass about 40 g for covering test specimens and reference leather pieces.

**6.5 Release agent, non-staining**, to prevent sticking of the test specimens to the glass plates.

**6.6 Weights**, with a mass  $(1\ 000 \pm 10)$  g for loading test specimens.

**6.7 Colorimeter**, for measuring the colour of test specimens and reference leather pieces capable of converting the readings to the CIE colour scale values  $L^*$ ,  $a^*$  and  $b^*$  and of calculating the CIELAB colour differences  $\Delta L^*$ ,  $\Delta a^*$ ,  $\Delta b^*$  and  $\Delta E^*_{ab}$  automatically in accordance with CIE 15.2.

**6.8 Oven**, for storing loaded test specimens and reference leather pieces in the dark at a temperature of  $(60 \pm 2)$  °C.

**6.9 Light exposure apparatus**, in accordance with EN 1244 containing a xenon arc lamp, a light filter, a heat filter, a temperature sensor and an irradiation-measuring device.

## 7 Leather

The leather to be tested shall have a uniform surface of the upper side and an even, uniform reverse side free from any contamination (e.g. adhesives, dust or release agents).

Identify the leather as fully as possible. Record type and name and/or designation of the leather, supplier, date of supply, colour, thickness and, if known, type of tanning, and the composition of a surface coat, if any,

## 8 Adhesive

Identify the adhesive used by name and/or designation, manufacturer, date of manufacture/supply and/or lot number, expiry date, main polymer, colour and viscosity in the test report. For two-part adhesives identify also the nature of the crosslinking agent and mixing ratio of the components.

## 9 Preparation of test specimens and reference leather pieces

Cut, using a cutting knife (6.1), from the leather to be tested, two rectangular pieces  $(200 \pm 5)$  mm x  $(70 \pm 5)$  mm.

Take a sample in accordance with EN 1066 of the adhesive to be used and examine and prepare it in accordance with EN 1067.

Apply the adhesive within the limits given by the adhesive manufacturer on the reverse side of one of the leather pieces cut as above indicated and spread the adhesive by a coating device (6.2) so that it covers the full area. The dry coat shall have an equal thickness, a uniform surface structure and shall not contain any bubbles.

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Allow the adhesive coat to dry, cool or set for the period of time specified by the adhesive manufacturer. If not specified use  $(30 \pm 5)$  min at a controlled temperature of  $(23 \pm 5)$  °C and a relative humidity of less than 70%.

The adhesive used can be applied in accordance with the instructions of its manufacture by several coats (always after drying of the preceding coat) on the leather piece. Record the number of adhesive coats applied and the drying times in the test report.

Cut from the coated leather piece at least three pieces (test specimens)  $(50 \pm 2)$  mm x  $(50 \pm 2)$  mm and from the uncoated leather pieces, the same number of pieces (reference leather pieces) of the same dimensions.

Determine the mass of adhesive applied by weighing the test pieces, with and without adhesive, using the analytical balance (6.3) and record it.

## 10 Procedure

### 10.1 Colour measurement of test specimens and reference leather pieces

Standardise the colorimeter (6.7) to a white standard (standard illuminant D 65, standard observer 10°, geometry of measurement  $d/8^\circ$ ), before any measurement.

Determine all CIE  $L^*$ ,  $a^*$  and  $b^*$  values of test specimens and reference leather pieces by the colorimeter in accordance with CIE 15.2. Note all values measured in the test report.

### 10.2 Storage/exposure of test specimens and reference leather pieces

Depending on the type of leather to be tested and the adhesive used in practice colour changes of white or bright coloured leather surfaces caused by migration often appear accelerated under the influence of heat and/or light.

Taking into account this experience store the 3 test specimens prepared according to clause 9 and the same number of reference pieces.

#### 10.2.1 Storage 7 days at $(60 \pm 2)$ °C in the dark between glass plates.

Measure the colour values of the test specimens and of the reference leather pieces before storage as specified in subclause 10.1 and note the colour values in the test report.

Place the test specimens and the reference leather pieces between two-glass plates (6.4). If required, use a light coat of a non-staining release agent (6.5). Load these assemblies with a 1 000 g weight (6.6) and store them with the uncoated leather upper sides uppermost in an oven (6.8) controlled at  $(60 \pm 2)$  °C, during 7 days.

Each day take the assemblies from the oven, remove the glass plates from the test specimens and the reference leather pieces, measure their colour values as specified in subclause 10.1 and note them in the test report. Replace the glass plates and store them again in the oven.

Repeat this procedure until a colour change of  $\Delta E_{ab}^*$  0,5 or more appears or at least up to 7 days.

#### 10.2.2 Exposure 7 days to light.

Measure the colour values of the test specimens and of the reference leather pieces as specified in subclause 10.1 and note them in the test report.

Mount the test specimens and the reference leather pieces in a holder of the exposure apparatus (6.9) and proceed in accordance with EN 1244.

Measure at daily intervals the colour values of the test specimens and of the reference leather pieces as specified in subclause 10.1 and note them in the test report.

Continue with the exposure until a discoloration of  $\Delta E_{ab}^*$  0,5 or more appears or at least up to 7 days.