



SLOVENSKI STANDARD

SIST EN 14288:2004

01-maj-2004

Usnje – Fizikalno in mehansko preskušanje – Ugotavljanje karakteristik meglivosti

Leather - Physical and mechanical tests - Determination of fogging characteristics

Leder - Physikalische und mechanische Prüfungen - Bestimmung der Fogging-Eigenschaften

Cuir - Essais physiques et mécaniques - Détermination des caractéristiques de la condensation provoquée par le cuir

Ta slovenski standard je istoveten z: **EN 14288:2003**

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ICS:

59.140.30 Usnje in krzno Leather and furs

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EUROPEAN STANDARD
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English version

Leather - Physical and mechanical tests - Determination of fogging characteristics

Cuir - Essais physiques et mécaniques - Détermination des caractéristiques de la condensation provoquée par le cuir

Leder - Physikalische und mechanische Prüfungen - Bestimmung der Fogging-Eigenschaften

This European Standard was approved by CEN on 1 October 2003.

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 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 Management Centre 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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

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

EN 14288:2003 (E)

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Foreword

This document EN 14288:2003 has been prepared by Technical Committee CEN/TC 289 "Leather", the secretariat of which is held by UNI.

It is based on DIN 75201 of Deutsches Institut für Normung.

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 June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

Annexes A and B are informative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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EN 14288:2003 (E)**1 Scope**

This European Standard specifies two alternative methods for determining the fogging characteristics of leathers used in the passenger compartments of motor vehicles, namely Method A and Method B. However, these are 2 different test procedures to measure the volatile components and there is no mathematical correlation between the results obtained with Method A and those with Method B.

Method A determines by reflection the light scattering properties (or opaqueness) and the nature of the film or droplet formation from volatile components condensed on a cold glass surface. Method B measures gravimetrically the quantity of volatile components condensed on a cold aluminium foil surface. Annex A gives the results of inter-laboratory trial which show that Method B performs well whereas Method A showed a large variation in the percentage reflection.

The test conditions allow the two tests to be carried out in succession.

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 (including amendments).

EN ISO 2418, *Leather - Chemical, physical and mechanical and fastness tests - Sampling location (ISO 2418:2002)*.

EN ISO 2419, *Leather - Physical and mechanical tests - Sample preparation and conditioning (ISO 2419:2002)*.

EN ISO 3696:1995, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)*.

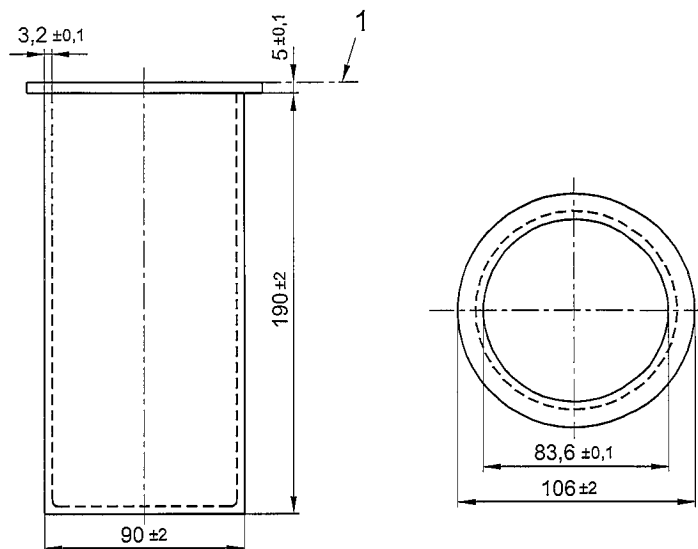
3 Method A - Reflectometer method**3.1 Principle**

A test piece is heated in a glass beaker, any volatile ingredients are condensed onto a cooled glass plate and the reflectometer value of the glass plate with condensed fog is expressed as a percentage of the reflectometer value of the same plate without fogging condensate. The measurement by light reflection depends on the nature of the film/droplet formation and needs careful interpretation. An example is that a thick but clear film can give a good test result when in actual fact it is a bad result in terms of volatiles. The test should be stopped if a transparent oily film is formed on the glass. The reflection measurement result is only valid when an even opaque film (like a fogged windscreen) formed by small droplets is present. (See annex A)

3.2 Apparatus

3.2.1 Beaker, plane bottomed, of heat-resistant glass, with a flat ground rim at the top without a pouring spout, with an outside diameter of 90 mm \pm 2 mm, height 190 mm \pm 2 mm. See Figure 1. A beaker with a minimum weight of 450 g is needed to prevent floating in the thermostatic bath (3.2.2).

Dimensions in millimetres

**Key**

1 Ground

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Figure 1 — Beaker

3.2.2 Thermostatic bath, capable of operating at a uniform temperature of $100 \text{ }^\circ\text{C} \pm 1 \text{ }^\circ\text{C}$ and of holding at least three beakers (3.2.1). The dimensions of the bath shall be such that the minimum distance between the beakers and the sides of the bath is 30 mm and the minimum distance between the base of the beaker and the base of the bath is 75 mm.

3.2.3 Thermal-transfer fluid, stable at $100 \text{ }^\circ\text{C}$.

NOTE Water-soluble materials such as modified polyvalent dialiphatic alcohols are preferred since they are water soluble and present less problems in cleaning.

3.2.4 Cooling system, with water at $21 \text{ }^\circ\text{C} \pm 1 \text{ }^\circ\text{C}$ circulating through the complete interior of a corrosion-resistant metal plate. The surface used for cooling shall be flat and made from aluminium. The mass of the cooling plate shall be sufficient to suppress the buoyancy of the beaker in the thermostatic bath.

NOTE The mass of the cooling plate filled with water will normally be in excess of 1 kg.

3.2.5 Metal rings, external diameter $80 \text{ mm} \pm 1 \text{ mm}$, internal diameter $74 \text{ mm} \pm 1 \text{ mm}$, height $10 \text{ mm} \pm 1 \text{ mm}$ and mass $55 \text{ g} \pm 1 \text{ g}$ made from corrosion-protected steel.

3.2.6 Sealing rings, of silicone-rubber or fluororubber, inner diameter $95 \text{ mm} \pm 1 \text{ mm}$, thickness $4,0 \text{ mm} \pm 0,1 \text{ mm}$ and hardness $65 \text{ IRHD} \pm 5 \text{ IRHD}$.

3.2.7 Reflectometer, with 60° incident beam and 60° measuring beam.

3.2.8 Clock, reading to 1 min.

3.2.9 Desiccator, containing phosphorus pentoxide.

NOTE This product is corrosive and care should be taken in handling.

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3.2.10 Float glass plates, of residential or windshield quality, thickness $3,0 \text{ mm} \pm 0,2 \text{ mm}$ and minimum dimensions $110 \text{ mm} \times 110 \text{ mm}$, with a mark engraved on the upper surface. The plates shall be used a maximum of 10 times.

3.2.11 Spacer mount, with circular hole made of any suitable material of thickness $0,10 \text{ mm} \pm 0,02 \text{ mm}$, marked to allow positioning of the reflectometer to give four readings $25 \text{ mm} \pm 5 \text{ mm}$ from the centre of the plate.

NOTE The spacer mount prevents contact between the condensate and the reflectometer. The actual size and geometry will depend on the dimensions of the reflectometer.

3.2.12 Matt black surface, minimum dimensions $200 \text{ mm} \times 200 \text{ mm}$.

3.2.13 Di-isodecyl phthalate, DIDP, analytical reagent grade or equivalent.

3.2.14 Dishwasher.

3.2.15 Glass cleaning detergent.

3.2.16 Distilled or deionized water, conforming to the requirements of grade 3 of EN ISO 3696:1995.

3.2.17 Ethyl acetate.

3.2.18 Acetone.

3.2.19 Cotton wool, degreased with ethyl acetate.

3.2.20 Test ink, 1,0 g fuschine dissolved in a mixture of 27,1 ml methanol (analytical reagent grade or equivalent) and 72,9 ml distilled or deionized water.

NOTE This solution has a surface tension of 46 mN/m .

3.2.21 Brush, diameter about 8 mm.

3.2.22 Press knife, the inner wall of which is a right angled circular cylinder of diameter $80 \text{ mm} \pm 1 \text{ mm}$ conforming to EN ISO 2419.

3.2.23 Polyethylene gloves, or tweezers or forceps.

3.2.24 Filter paper, qualitative type with nominal diameter 125 mm.

3.3 Sampling and sample preparation.

3.3.1 Sample in accordance with EN ISO 2418. Cut 4 test pieces by applying the press knife (3.2.22) to the grain surface. Use two test pieces for two test sequences. If agreement between the first two test pieces is satisfactory, the other two test pieces do not need to be tested.

NOTE If there is a requirement for more than two hides or skins to be tested in one batch, then only one sample need be taken from each hide or skin, provided that the overall total is not less than four test pieces.

3.3.2 Dry test pieces by storing in a desiccator (3.2.9) over phosphorus pentoxide for a minimum of 2 days.

If the test piece fails, then dry the test piece for 7 days for the repeat test.

Wet leather test pieces need to be air dried before being put in the desiccator for conditioning.

NOTE Other desiccants (e.g. reusable silica gel) can be used if they can be shown to lead to the same results.

3.4 Cleaning

3.4.1 Wash beakers (3.2.1), metal rings (3.2.5) and sealing rings (3.2.6) twice manually or in a dishwasher using an appropriate glass cleaning detergent, rinse with distilled or deionized water at room temperature and dry in an upright position.

3.4.2 Clean float glass plates (3.2.10) either in a dishwasher (3.4.2.1) or manually (3.4.2.2).

3.4.2.1 Wash the plates in a dishwasher at $80\text{ °C} \pm 5\text{ °C}$ using an appropriate glass cleaning detergent, rinse with distilled or deionized water at room temperature and dry in an upright position.

3.4.2.2 Wash the plates manually using ethyl acetate and cotton wool then rinse the plates with acetone, soaking the plates in acetone for a minimum of 30 min. Dry the plates in an upright position.

3.4.3 Inspect the glass plates and reject any that are scratched.

3.4.4 Using the brush (3.2.21), apply a thin line of test ink (3.2.20) to an area of the glass plate where there will be no condensation. Observe the line of ink. If the edges contract within 2 s repeat the cleaning procedure in 3.4.2.1 or 3.4.2.2. If the edges of the ink line contract after repeated cleaning, discard the glass plate.

NOTE If the fluid film contracts then the adhesion tension of the glass is less than the surface tension of the test ink.

3.4.5 After cleaning handle beakers only on the outer surface. Handle other cleaned apparatus with tongs or gloves (3.2.23).

3.4.6 Store cleaned apparatus in a dust-free environment at room temperature.

3.5 Procedure

3.5.1 Test pieces, cleaned surfaces and everything that goes into the beaker shall not be touched with bare hands. Polyethylene gloves shall be worn, or use tweezers or forceps (3.2.23).

3.5.2 Pour sufficient thermal transfer fluid (3.2.3) into the thermostatic bath (3.2.2) so that the distance between the level of the fluid and the rim of the beaker is $57\text{ mm} \pm 3\text{ mm}$.

3.5.3 Switch on the bath and allow the fluid to equilibrate at $100\text{ °C} \pm 1\text{ °C}$.

3.5.4 Calibrate the reflectometer (3.2.7) according to the manufacturer's instructions.

3.5.5 Place the cleaned glass plate on the matt black surface (3.2.12). Place the spacer mount (3.2.11) on the glass plate. Position the reflectometer on the spacer mount with the edge of the reflectometer against the marking on this spacer mount. Record the reflectometer value.

3.5.6 Rotate the reflectometer through 90° and position against the second set of marks. Record the reflectometer value.

3.5.7 Repeat 3.5.6 twice to give a total of four reflectometer values. Determine the mean of the four values.

3.5.8 Place a test piece in a cleaned beaker (3.2.1) with the side facing the motor vehicle interior uppermost.

Place a metal ring (3.2.5) over the test piece to prevent it distorting during the test.

3.5.9 Place a sealing ring (3.2.6), glass plate and filter paper (3.2.24) on top of the beaker in that order.

3.5.10 Repeat 3.5.5 to 3.5.9 for the remaining test pieces.

3.5.11 Place the beakers in the thermostatic bath at $100\text{ °C} \pm 1\text{ °C}$ and place the cooling plate (3.2.4) on top of the filter paper with the cooling surface downwards.