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BSI Standards Publication

Leather — Leather for automotive — Test methods and testing parameters

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee TCI/69, Footwear, leather and coated fabrics.

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

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Foreword

This document (EN 14906:2012) has been prepared by Technical Committee CEN/TC 289 “Leather”, 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of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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Introduction

This document was prepared by CEN/TC 289 "Leather" in order to provide the leather and the automotive industries with methods to be used for testing on which sellers and buyers can base their specifications and negotiations.

1 Scope

This European Standard gives guidelines to select the test methods to assess the performance of leather for automotive. This document also specifies the sampling and conditioning procedures of specimens.

NOTE Regulations on chemical substances in consumer goods might differ from country to country requiring for any given market a special attention to restricted substances.

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 15987:2011, *Leather — Terminology — Key definitions for the leather trade*

EN 20105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour (ISO 105-A02)*

EN ISO 105-B06, *Textiles — Tests for colour fastness — Part B06: Colour fastness and ageing to artificial light at high temperatures: Xenon arc fading lamp test (ISO 105-B06)*

EN ISO 2418, *Leather — Chemical, physical and mechanical and fastness tests — Sampling location (ISO 2418)*

EN ISO 2419, *Leather — Physical and mechanical tests — Sample preparation and conditioning (ISO 2419)*

EN ISO 2420, *Leather — Physical and mechanical tests — Determination of apparent density (ISO 2420)*

EN ISO 2589, *Leather — Physical and mechanical tests — Determination of thickness (ISO 2589)*

EN ISO 3376, *Leather — Physical and mechanical tests — Determination of tensile strength and percentage extension (ISO 3376)*

EN ISO 3377-1, *Leather — Physical and mechanical tests — Determination of tear load — Part 1: Single edge tear (ISO 3377-1)*

EN ISO 4044, *Leather — Chemical tests — Preparation of chemical test samples (ISO 4044)*

EN ISO 5402-1, *Leather - Determination of flex resistance - Part 1: Flexometer method (ISO 5402-1)*

EN ISO 9237, *Textiles — Determination of permeability of fabrics to air (ISO 9237)*

EN ISO 11640, *Leather — Tests for colour fastness — Colour fastness to cycles of to-and-fro rubbing (ISO 11640)*

EN ISO 11644, *Leather — Test for adhesion of finish (ISO 11644)*

EN ISO 14087, *Leather — Physical and mechanical tests — Determination of bending force (ISO 14087)*

EN ISO 14268, *Leather — Physical and mechanical tests — Determination of water vapour permeability (ISO 14268)*

EN ISO 15700, *Leather — Tests for colour fastness — Colour fastness to water spotting (ISO 15700)*

EN ISO 15701, *Leather — Tests for colour fastness — Colour fastness to migration into plasticized poly(vinyl chloride) (ISO 15701)*

EN ISO 17071, *Leather — Physical and mechanical tests — Determination of fogging characteristics (ISO 17071)*

EN ISO 17074, *Leather — Physical and mechanical tests — Determination of resistance to horizontal spread of flame (ISO 17074)*

EN ISO 17076-2, *Leather — Determination of abrasion resistance — Part 2: Martindale ball plate method (ISO 17076-2)*

EN ISO 17186, *Leather — Physical and mechanical tests — Determination of surface coating thickness (ISO 17186)*

EN ISO 17226-3, *Leather — Chemical determination of formaldehyde content — Part 3: Determination of formaldehyde emissions from leather (ISO 17226-3)*

EN ISO 17227, *Leather — Physical and mechanical tests — Determination of dry heat resistance of leather (ISO 17227)*

EN ISO 17228, *Leather — Tests for colour fastness — Change in colour with accelerated ageing (ISO 17228)*

EN ISO 23910, *Leather — Physical and mechanical tests — Measurement of stitch tear resistance (ISO 23910)*

ISO 2588, *Leather — Sampling — Number of items for a gross sample*

ISO 26082-1, *Leather — Physical and mechanical test methods for the determination of soiling — Part 1: Rubbing (Martindale) method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15987:2011 and the following shall apply.

3.1
upholstery
seat and headrest

3.2
trim
armrest, dashboard, trim-panel, steering-wheel, gear-knob

4 General principles

This document considers different types of leather intended for automotive upholstery, trims, such as steering-wheels/gear-knobs.

5 Sampling

5.1 Laboratory samples shall be located and identified in accordance with EN ISO 2418.

5.2 The number of leather samples shall be in accordance with ISO 2588, if not otherwise agreed by the parties.

6 Conditioning and sample preparation

Leather samples shall be conditioned and prepared for physical, mechanical and fastness tests in accordance with EN ISO 2419.

Leather samples for chemical tests shall be conditioned and prepared in accordance with EN ISO 4044.

7 List of test methods

The following tables define test methods which should be used to test automotive leather. The parameters to be tested are divided in fundamental properties (Table 1) and complementary properties (Table 2).

Table 1 — List of fundamental properties

Basic property	Property	Test method	Comments
Basic parameters	Apparent density, mass per unit area	EN ISO 2420	
	Thickness	EN ISO 2589	
	Surface coating thickness	EN ISO 17186	
Tensile properties	Tensile strength	EN ISO 3376	
	Elongation at break	EN ISO 3376	
	Elongation at defined forces	EN ISO 3376	
	Tear load	EN ISO 3377-1	
	Adhesion of finish	EN ISO 11644	
	Stitch tear resistance	EN ISO 23910	
Stiffness in bending		EN ISO 14087	
Durability /wear	Flex resistance	EN ISO 5402-1	
	Abrasion	EN ISO 17076-2	
Ageing	Colour change by heat and hydrolytic ageing	EN ISO 17228	Conditions (temperature, humidity, time,…) to be defined by customer requirements
	Dimensional change by heat ageing	EN ISO 17227 (for shrinkage measurement) EN ISO 17228 (ageing procedures)	Conditions (temperature, humidity, time,…) to be defined by customer requirements
Light fastness	Colour fastness to artificial light at high temperatures	EN ISO 105-B06	Exposure condition 3 – normal; apparatus type C; filter system BS/SL;

			delta E 4.3 ± 0.4 for blue scale 6 for each cycle (exposed blue wool scale 6 shall be supported by a non exposed blue wool scale 6); sample evaluation: exposed region against original sample (without any ageing) according to EN 20105-A02
	Colour fastness and ageing to artificial light at high temperatures	EN ISO 105-B06	Exposure condition 3 – normal; apparatus type C; filter system BS/SL; delta E 4.3 ± 0.4 for blue scale 6 for each cycle (exposed blue wool scale 6 shall be supported by a non exposed blue wool scale 6); sample evaluation: exposed region against original sample (without any ageing) according to EN 20105-A02

Fastness	Fastness to and fro rubbing	EN ISO 11640	
	Fastness to water spotting	EN ISO 15700	Test surface to be defined amount of water to be defined

Emission behaviour	Fogging	EN ISO 17071	Gravimetric procedures only drying 7 days minimum
	Volatile organic compounds (VOC)	No EN or ISO standard available at present	See Note 1.
	Odour	No EN or ISO standard available at present	See Note 2.
	Formaldehyde emission	EN ISO 17226-3	

Others	Resistance to horizontal spread of flame	EN ISO 17074	Further requirements according to legislation are discussed with customers
	Soiling and cleanability	ISO 26082-1	
	Loose grain effect	No EN or ISO standard available at present	See Note 3.

NOTE 1 Widely applied test methods for the determination of VOC are described in VDA 277 (*Non-metallic materials in automotive interior trim — Determination of emission of organic compounds*) and VDA 278 (*Thermal Desorption Analysis of Organic Emissions for the Characterization of Non-Metallic Materials for Automobiles*).

NOTE 2 A widely applied test method for odour testing is described in VDA 270 (*Determination of the odour characteristics of trim materials in motor vehicles*).

NOTE 3 A widely applied test method for determination of loose grain effect is described in VDA 230-205 (*Automotive leather — Determination loose grain effect*).

Table 2 — List of complementary properties

Basic property	Property	Test method	Comments
Fastness	Colour fastness to migration	EN ISO 15701	
	Resistance to insect repellents	EN ISO 11640	10 cycles, 10 % elongation, 0.4 ml DEET (100 %, CAS 134-62-3) on the felt by pipette
	Resistance to sun lotion	No EN or ISO standard available at present	Standardized sun lotion is currently not available
Others	Water vapour permeability	EN ISO 14268	Without pre-treatment
	Stick-slip-behaviour	No EN or ISO standard available at present	See Note.
	Permeability to air	EN ISO 9237	For perforated leather only, (test area 100 cm^2, pressure drop 100 Pa, leather surface to suction side, without correction of side effect
NOTE A widely applied test method for determination of stick slip effect is described VDA 230-206-1 (*Examination of the stick-slip behaviour of material pairs — General section*) and VDA 230-206-2 (*Examination of the stick-slip behaviour of material pairs — Specific section — Leather: Leather against Leather*).			

8 Test reports

The test reports shall contain at least the information defined in used standard test methods. The test reports should also include additional information (e.g. special evaluation of specimens) requested in specifications.

Bibliography

[1] International glossary of leather terms (English<>French<>German<>Spanish<>Italian), 2nd edition, revised, pp.320, 1975 (reprinted with addenda incorporated, 1997)

[2] VDA 230-205, *Automotive leather — Determination of loose grain effect*

[3] VDA 230-206-1, *Examination of the stick-slip behaviour of material pairs — General section*

[4] VDA 230-206-2, *Examination of the stick-slip behaviour of material pairs — Specific section — Leather: Leather against Leather*

[5] VDA 270, *Determination of the odour characteristics of trim materials in motor vehicles* (currently only available in German language)

[6] VDA 277, *Non-metallic materials in automotive interior trim — Determination of emission of organic compounds* (currently only available in German language)

[7] VDA 278, *Thermal Desorption Analysis of Organic Emissions for the Characterization of Non-Metallic Materials for Automobiles* (currently only available in German language)

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