Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-14052-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 06.06.2018 to 22.02.2020 Date of issue: 06.06.2018

Holder of certificate:

imat-uve gmbh

For their sites

Krefelder Straße 679-691, 41066 Mönchengladbach
Gottlob-Armbrust-Straße 18, 71296 Heimsheim
Hedelfinger Straße 61, 70327 Stuttgart

Tests in the fields:

selected tests of airborne organic pollutants in the context of indoor air measurements and test chamber analysis;
selected physical, physico-chemical and chemical tests of raw materials, pre- and end products as well as component parts of the automotive industry, in particular of polymeric materials and products from renewable raw materials;
temperature, humidity, solar simulation (halogenide spotlight), hot light aging, mechanical continuous stress as well as in their combination environmental simulation tests (qualification tests) and measurements of length, brightness, color and force and three-dimensional deformation and change of pre- and end products as well as component parts of the automotive industry;
Implementation of functional tests of sports, protection and technology of synthetic turf coverings and synthetic turf systems;
specific tests of plastics and textiles

Abbreviations used: see last page

Within the scope of accreditation marked with *, the testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use standards or equivalent testing methods listed here with different issue dates.**

Within the given testing field marked with *, the testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, the free choice of standard or equivalent testing methods.

The listed testing methods are exemplary. The testing laboratory maintains a current list of all testing methods within the flexible scope of accreditation.

The test methods are marked with the listed symbols of the locations, where they are implemented:

M = Mönchengladbach H= Heimsheim S = Stuttgart

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1 Examination of emission behavior from organics out of polymeric material and components, leather, derived timber products and textiles, predominantly for the use in motor vehicles, as well as building products

1.1 Examination of emission behavior from organics out of polymeric material, leather, derived timber products and textiles, predominantly for the use in motor vehicles

1.1.1 Determination of the fogging characteristics using Fogging Apparatus*

DIN 75201 2011-11	Determination of the fogging characteristics of trim materials in the interior of Automobiles	M
DIN EN ISO 17071 2011-12	Leather - Physical and mechanical tests - Determination of fogging characteristics	M
ISO 6452 2007-06	Rubber- or plastics-coated fabrics - Determination of fogging characteristics of trim materials in the interior of automobiles	M
VW PV 3015 1994-05	Non-Metallic Materials for Interior Trim - Determining Condensable Constituents (G)	M
DIN EN 14288 2004-03	Leather - Physical and mechanicals tests - Determination of fogging (*withdrawn standard*)	
SAE J 1756 2006-08	Determination of the Fogging Characteristics of Interior Automotive Materials	M

1.1.2 Formaldehyde Emission (photometric measurement) *

VDA 275 1994-07	Moulded composites and fleeces for vehicles; determination of formaldehyde release (Test procedure called modified flask method)	M
VW PV 3925 2009-06	Polymer Materials - Measuring Emissions of Formaldehyde	M
DIN EN 717-3 1996-05	Wood-based panels - Determination of formaldehyde release - Part 3: Formaldehyde release by the flask method	M

1.1.3 Determination of the emission from formaldehyde and other carbonyl compounds using HPLC with standard-detectors (UV) *

VDA 275 1994-07	Moulded composites and fleeces for vehicles; determination of formaldehyde release (Test procedure called modified flask method) (Deviation: *Measurement with HPLC after derivatisation with DNPH*)	M
GM/ Opel GMW 15635 2012-08	Determination of Aldehyde and Ketone Emissions from Interior Materials (application to C2 to C6- Carbonyles)	M
BMW AA-0061 2014-02	Formaldehyde emission from non-metallic materials and components, determined by HPLC (Formaldehyde, Acetaldehyde)	M
Ford FLTM BZ 156-01-B 2011-07	Determination of Aldehyde and Ketone Emission from non metallic Components, Parts and Materials in Vehicle Interiors by High Performance Liquid Chromatography (HPLC)	M

1.1.4 Determination of the odor characteristics of materials in motor vehicles using sensory examination *

VDA 270 1992-10	Determination of the odor characteristics of trim materials in motor vehicles	M
Ford FLTM BO 131-03 2014-04	Ford Laboratory Test Method - interior odor test	M
PSA D10 5517 2009-03	PSA PEUGEOT - CITROEN - Parts in Passenger Compartment and Boot - Assessment of Odour Strength	M
GMW 3205 2011-02	GM; Determining the Resistance to Odor Propagation of Interior Materials	M
TSM 0505 G	Toyota; Smell Quality of non-metallic materials	M
PV 3900 2000-05	Components in Passenger Compartment - Odor Test	M
VCS 1027, 2729 2004-05	Volvo; Odour of trim materials in vehicles	M

1.1.5 Determination of volatile organic compounds using gas chromatography with standard detectors (FID) and mass selective detection (MSD) *

VDA 277 1995-01	Nonmetallic materials of automotive interior of; determination of release of organic compounds	M
VDA 278 2011-10	Thermal desorption analysis of organic emissions for characterisation of nonmetallic materials for automotive	M S

1.2 Determination of organic emissions of building products as well as automobile interior trim components and component constituents

1.2.1 Examination of emission behavior of building products and components or component constituents by climate testing in emission test chambers and sampling indoor air *

Type of test	Measurand/ test parameter	Load range	smallest attainable measurement uncertainty	Characteristic test processes
Emission chamber test	Test chamber volume	0,2 m³ -2,0 m³	3%	DIN EN ISO 16000-9 DIN ISO 12219-4 VDA 276
	Temperature	15°C - 100°C	1 K	
	Relative air humidity	5%- 70% r.H.	3% r.H.	
	Air exchange	0 - 1,8 m³/h	3%	
	HC-concentration (FID)	0,05 - 1000 ml/m³	0,5 %	

VDA 276-1 2005-12	Determination of organic emission of interior components in motor vehicles in a 1m^3 emission chamber	S
VDA 276-2 2005-12	Determination of organic emission of interior components in motor vehicles in a 1m^3 emission chamber - Part 2: Determination of the release of formaldehyde, ammonia and phenoles by the method of equilibrium concentration	S
VDA 276-3 2005-12	Determination of organic emission of interior components in motor vehicles in a 1m^3 emission chamber Part 3: Determination of the total concentration of hydrocarbon compounds by flame ionization detector (FID)	S
DIN EN ISO 16000-9 2008-04	Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method (Sampling: S)	S

DIN ISO 12219-4 2013-12	Interior air of road vehicles - Part 4: Method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials - Small chamber method	S
BMW GS 97014-3 2014-04	Emissions measurement with air exchange in a testing chamber - Determination of volatile, organic emissions from components, semi-finished products and materials	S
BMW GS 97014-2 2011-04	Emissions measurement in SHED chambers - Determination of volatile, organic emissions from components, semi-finished products and materials that do not carry fuel	S
Porsche PPV 4050 / VW 96390 2009-02	Determination of volatile, organic emissions from components that do not carry fuel - Emissions measurement in SHED-chambers	S
Porsche PPV 8041 / VW 96423 2011-06	Interior - Emission behavior - Emissions measurement - in a Test chamber according to VDA 276-1	S
VW PV 3942 2000-12	Determining Organic Emissions from Components for the Passenger Cormpartment of Motor Vehicles - Emission Test	S
Volvo VCS 1027,2769 2007-10	Determination of volatile organic substances from interior components/systems using a 1m^3 emission chamber - Organic materials	S

1.2.2 Examination of emission behavior of components or component constituents of motor vehicle interior by storage in sample bags or micro-scale chambers and sampling indoor air *

DIN ISO 12219-2 2012-11	Interior air of road vehicles - Part 2: Screening method f or the determination of the emissions of volatile organic compounds from vehicle interior parts and materials - Bag method	M
DIN ISO 12219-3 2013-12	Interior of road vehicles - Part 3: Screening method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials - Micro- scale chamber method	M

Toyota TSM 0508G 2009-06	Volatile Component Measurement Method Using Sampling Bag	M
Suzuki SES N 2403 2012-07	Standard for Control of Volatile Organic Compounds Emission	M
Hyundai/KIA MS 300-55 2012-02	Test Method of Volatile Organic Compounds from Vehicle Interior Parts	M

1.2.3 Determination of formaldehyde and other carbonyl compounds in the indoor air from test chambers using HPLC with standard-detectors (UV-, UV-fluorescence-detection) *

DIN ISO 16000-3 2013-01	Indoor air - Part 3: Determination of formaldehyde and other carbonyl compounds; Sampling with a pump	M S
VDI 3862 Blatt 3 2000-12	Gaseous emission measurement Measurement of aliphatic and aromatic aldehydes and ketones by DNPH method Cartridges method	M S

1.2.4 Determination of volatile organics and groups of substances in the inside air out of test chambers using gas chromatography with mass selective detection (GC-MS) and chemiluminescence-detection (GC-TEA) *

DIN ISO 16000-6 2012-11	Indoor air - Part 6: Determination of volatile organic compounds VOC in indoor and test chamber air by active sampling on TENAX TA® sorbent, thermal desorption and gas chromatography using MS/FID (Deviation: *measurement by GC/MS*)	M S
VDI 4301 Blatt 6 2012-09	Measurement of indoor air pollution Measurement of phthalates with GC/MS	M
TD_G_CB_SOP_5.4_111_G_0 2009-09	Determination of selected phthalates on carriers of indoor air (Florisil) by GC-MS	M
BGI 505.23, Teil 4 1992-09	Methods for determination of N-nitrosamine - sampling with a pump and sorption on a solid phase, Capillary-Gaschromatography after elution	M

1.2.5 Determination of Odor characteristics of indoor air of test chambers

DIN ISO 12219-7 2017-08	Interior air of road vehicles- Part 7: Odour determination in interior air of road vehicles and test chamber air of trim components by olfactory measurements	S
BMW GS 97014-4 2012-11	Emission measurement with air exchange in a testing chamber - Determination of the olfactory behavior	S

1.2.6 Determination of volatile compounds and groups of substances in the indoor air of test chambers using photometry *

VDI 3484 Blatt 2 2001-11	Gaseous ambient air measurements - Indoor-air pollution measurements - Measurement of the formaldehyde concentration with the acetylacetone method	M
VDA 276 2005-12	Determination of organic emission of interior components in motor vehicles in a $1m^3$ emission chamber - Part 2: Determination of the release of formaldehyde, ammonia and phenoles by the method of equilibrium concentration - components for automotive interior	M

2 Quantitative analysis of selective parameters and analytes in polymeric material, leather and textiles, predominantly for the use in vehicle interior or in synthetic turf systems.

2.1 Gravimetric determination of extractable properties from mineral filler, parts of glass and ashes as well as volatile substances and water content *

VDA 675-125 1992-12	Elastomer components in motor vehicles - test method for identification - extractable properties	M
DIN EN ISO 6427 2014-08	Plastics - Determination of content of extractable properties by organic solvent (general methods)	M
ISO 6209 2009-07	Rubber compounding ingredients - Carbon black - Determination of solvent-extractable material	M
DIN EN ISO 4048 2006-04	Leather - Determination of matter soluble in dichloromethane	M

DIN 54278-1 1995-10	Testing of textiles - Coatings and attendant materials - Part 1: Determination of materials soluble in organic solvents	M
DIN EN 322 1993-08	Wood-based panels; determination of moisture content	M
Daimler DBL 5555-B 2014-04	Plastics - Determination of water content by drying for 72 hours in a heating oven at 105°C	M
Daimler DBL 5555-C 2014-04	Plastics - Determination of water content by drying with an infrared dryer at 110±5°C	M
DIN EN ISO 3451-1 2008-11	Plastics - Determination of ash - Part 1: General methods	M
ISO 3451-2 1998-12	Plastics - Determination of ash - Part 2: Poly (alkylene-terephthalate) materials	M
DIN EN ISO 3451-3 1991-04	Plastics - determination of ash - unplasticized acetyl cellulose	M
DIN EN ISO 3451-4 2001-08	Plastics - determination of ash - Part 4: polyamides	M
DIN EN ISO 3251 2008-06	Paints, varnishes and plastics - Determination of non-volatile-matter content	M
DIN EN ISO 4684 2006-02	Leather - Chemical tests - Determination of volatile matter	M
DIN EN ISO 1172 1998-12	Textile-glass-reinforced plastics - Prepregs, moulding compounds and laminates - Determination of the textile-glass and mineral-filler content; calcination methods	M
VDA 675-130 1992-12	Elastomer components in motor vehicles - test method for identification - ash content without chemical treatment	M

2.2 Determination of organic compounds and groups of substances using gas chromatography with standard-detectors (FID, ECD) and mass selective detection (MSD) *

DIN EN 13130-4 2004-08	Determination of 1,3-butadiene in plastics	M
DIN EN ISO 14389 2014-10	Textiles - Determination of the phthalate content - Tetrahydrofuran method	M
CEN/TR 14823 2004	Durability of wood and wood based products - quantitative determination of pentachlorphenol (PCP) in wood - gas chromatographic method	M
DIN EN ISO 17070 2007-01	Leather - Chemical tests - Determination of pentachlorphenol content	M

2.3 Determination of water content in plastics and mineral oil products using coulometric titration according to Karl Fischer *

ISO 15512 2014-09	Plastics - Determination of water content (application of method A and method B2)	M
DIN 53715 1991-05	Testing of plastics; determination of water content by titration according to Karl Fischer	M
E DIN 51777 2014-10	Petroleum products - Determination of water content using titration according to Karl Fischer	M
DIN EN ISO 12937 2002-03	Petroleum products - Determination of water - coulometric Karl Fischer titration method	M

2.4 Determination of Formaldehyde using photometry *

DIN EN ISO 17226-2 2009-09	Leather - Chemical determination of formaldehyde content - Part 2: Method using colorimetric analysis	M
DIN EN ISO 14184-1 2011-12	Textiles - Determination of formaldehyde - Part 1: Free and hydrolysed formaldehyde (water extraction method)	M

2.5 Determination of Formaldehyde and other carbonyl compounds by HPLC with standard-detectors (UV)

DIN EN ISO 17226-1 2008-08	Leather - Chemical determination of formaldehyde content - Part 1: Method using high performance liquid chromatography	M

2.6 Determination of selected UV-stabilizers using HPLC in polymeric material with standard-detectors (HPLC-UV-detection)

ASTM D6042-09 2016	Standard Test Method for Determination of Phenolic Antioxidants and Erucamide Slip Additives in Polypropylene Homopolymer Formulations Using Liquid Chromatography (LC) (Deviation: *extraction and treatment of extracts*)	M

3 Determination of flammability of materials, predominantly in use for motor vehicle interior

3.1 Determination of the horizontal burning rate of interior materials in motor vehicles *

DIN 75200 1980-09	Determination of burning behaviour of interior materials in motor vehicles	M
ISO 3795 1989-10	Road vehicles, and tractors and machinery for agriculture and forestry - Determination of burning behavior of interior materials	M
FMVSS 302 2008-10	Flammability of Interior Materials	M
GB 8410-2006 2006-01	National Standard of the People's Republic of China - Flammability of Interior Materials	M

4 Mechanical characteristics and physical properties of polymeric material and components, leather and textiles, predominantly for the use in vehicle interior as well as sports grounds

4.1 Examination of mechanical characteristics of plastics and textiles *

Type of test	Measurand/ test parameter	Load range	smallest attainable measurement uncertainty	Characteristic test processes
Tensile, Compression, Deflection	Tensile force	1 N - 2 kN 10 N - 10 kN 5 N - 10 kN 25 N - 10 kN	Class 1 Class 0,5 (DIN EN ISO 7500-1)	DIN EN ISO 527
	Compressive force	1 N - 2 kN 10 N - 10 kN 5 N - 10 kN 25 N - 10 kN	Class 1 Class 0,5 (DIN EN ISO 7500-1)	DIN EN ISO 3386
	Bending force	1 N - 2 kN 10 N - 10 kN N - 10 kN 25 N - 10 kN	Class 1 Class 0,5 (DIN EN ISO 7500-1)	DIN EN ISO 178
Length	Length	Dial gauge (digital): 0 mm – 12,5 mm 1 mm – 10 mm 10 mm – 115 mm 150 mm – 500 mm	 0,03 mm 0,01 mm 0,05 mm 1,5 mm	 DIN 53435 DIN EN ISO 527
Change of lentgh	Distance	Traverse distance 5 mm – 500 mm	Class 1 (DIN EN ISO 9513)	DIN EN ISO 13934-1
	Elongation Distance	0,1 mm – 13,5 mm 0,02 mm – 40 mm	Class 1 Class 0,5 (DIN EN ISO 9513)	DIN EN ISO 527
	Bending distance	0,1 mm – 50 mm	Class 1 (DIN EN ISO 9513)	DIN EN ISO 178
Impact loading	Impact energy	0,5 J – 15 J	Deviation of display <0,5 % referred to potential energy (equal DIN 51222)	DIN EN ISO 179
		5,5 J – 11 J		DIN EN ISO 180
		0,5 J – 15 J		DIN 53435
Hardness	Ball indentation hardness Test force	23,8 N/mm^2 - 467 N/mm^2 9,8 N – 961 N	3 % 1 %	DIN EN ISO 2039-1

4.1.1 Flexural tests of plastics *

DIN EN ISO 178 2013-09	Plastics - Determination of flexural properties	M
DIN 53435 1983-07	Testing of plastics; bending test and impact test on dynstat test pieces (here: *Application of bending test*)	M

4.1.2 Tensile tests of plastic materials and textiles *

DIN EN ISO 527-1 2012-06	Plastics - Determination of tensile properties - Part 1: General principles	M
DIN EN ISO 527-2 2012-06	Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics	M
DIN EN ISO 527-4 1997-07	Plastics - Determination of tensile properties - Part 4: Test conditions for isotropic and anisotropic fibre-reinforced plastic composites	M
DIN EN ISO 527-5 2010-01	Plastics - Determination of tensile properties - Part 5: Test conditions for unidirectional fibre-reinforced plastic composites	M
DIN 53354 1981-02	Testing Synthetic Leather - tensile test (*withdrawn standard*)	M
DIN 53356 1982-08	Testing Synthetic Leather and similar Fabrics - Tear Test	M
DIN 53357-A 1982-10	Testing Plastic Membranes and Plastic Foils - Separation Test on Layers (procedure A) (*withdrawn standard*)	M
ISO 4919 2012-08	Carpets; Determination of tuft withdrawal force	M
DIN EN 13864 2004-09	Surfaces for sports areas - Determination of tensile strength of synthetic yarns	M
DIN EN 12230 2003-07	Surfaces for sports areas - Determination of tensile properties of synthetic sports surfaces	M

DIN EN 12228 2013-12	Surfaces for sports areas - Determination of joint strength of synthetic surfaces	M
DIN 18035-7 2014-10	Sports grounds - Part 7: Synthetic turf areas 7.9: Determination of tensile Strength, transverse	M
DIN EN ISO 13934-1 2013-08	Textiles - Tensile properties of fabrics - Part 1: Determination of maximum force and elongation at maximum force using the strip method	M
DIN EN ISO 13935-1 1999-04	Textiles - Seam tensile properties of fabrics and made-up textile articles - Part 1: Determination of maximum force to seam rupture using the strip method (*withdrawn standard*)	M
VW PV 3946 2001-02	Upholstery material; Determination of the strength, resistance to tearing and shifting of seams	M
DIN 53859-5-A 1992-12	Testing of textiles; tear growth test on textile fabrics; trapezoid test	M
DIN EN ISO 13937-2 2000-06	Textiles - Tear properties of fabrics - Part 2: Determination of tear force of trouser-shaped test specimens (Single tear method)	M
DIN EN ISO 13937-3 2000-06	Textiles - Tear properties of fabrics - Part 3: Determination of tear force of wing-shaped test specimens (Single tear method)	M
DIN EN ISO 3377-1 2012-03	Leather - Physical and mechanical tests - Determination of tear load - Part 1: Single edge tear	M
DIN EN ISO 8067 2009-06	Flexible cellular polymeric materials - Determination of tear strength	M
DIN ISO 34-1 2005-07	Rubber, vulcanized or thermoplastic - Determination of tear strength - Part 1: Trouser, angle and crescent test pieces	M

4.1.3 Compression test on foamed plastics *

DIN EN ISO 3386-1 2010-09	Polymeric materials, cellular flexible - Determination of stress-strain characteristics in compression - Part 1: Low-density materials	M

DIN EN ISO 3386-2 2010-09	Flexible cellular polymeric materials - Determination of stress-strain characteristics in compression - Part 2: High-density materials	M

4.1.4 Determination of strength by impact and the hardness of plastics *

DIN EN ISO 179-1 2010-11	Plastics - Determination of Charpy impact properties - Part 1: Non-instrumented impact test	M
DIN EN ISO 180 2013-08	Plastics - Determination of Izod impact strength	M
DIN 53435 1983-07	Testing of plastics; bending test and impact test on dynstat test pieces (here: *Application of impact test*)	M
DIN EN ISO 2039-1 2003-06	Plastics - Determination of hardness - Part 1: Ball indentation method	M
DIN EN ISO 75-2 2013-08	Plastics - Determination of temperature of deflection under load - Part1: General test method	M
DIN EN ISO 306 2014-03	Plastics - Thermoplastic materials - Determination of Vicat softening temperature (VST)	M

4.2 Determination of selective physical properties of plastics, leather and textiles *

Type of test	Measurand/ test parameter	Load range	smallest attainable measurement uncertainty	Characteristic test processes
Length	Length	Micrometer gauge 0,1 mm – 25 mm Slide gauge 0,1 mm – 150 mm 0,1 mm – 500 mm Metal rule 0,1 mm – 300 mm 0,1 mm – 1000 mm	 0,01 mm 0,08 mm 0,2 mm 0,55 mm 1,5 mm	 DIN EN ISO 1923 DIN EN ISO 2420 DIN EN 12127
Determination of length per weight/ area	Thickness Pressure	Thickness gauge 0,001 mm – 25 mm 0,2 kPa – 72 kPa	 0,03 mm 0,5 %	ISO 1766
Determination of mass	Mass	0,1 mg – 210 g 200 g – 10 kg	0,4 mg – 4 mg 1 g	 DIN EN ISO1183-1

4.2.1 Determination of density, raw density, mass by area and thickness of plastics, leather and textiles by weighing and length measurement *

DIN EN ISO 1183-1 2004-05	Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pyknometer method and titration method (only procedure A und B)	M
DIN EN ISO 2811-1 2011-06	Paints and varnishes - Determination of density - Part 1: Pyknometer method	M
DIN EN ISO 845 2009-10	Cellular plastics and rubbers - Determination of apparent density	M
DIN EN ISO 1923 1995-06	Cellular plastics and rubbers - Determination of linear dimensions	M
DIN EN ISO 2420 2003-10	Leather - Physical and mechanical tests - Determination of apparent density	M
DIN EN 12127 1997-12	Textiles - Fabrics - Determination of mass per unit area using small samples	M

DIN EN ISO 5084 1996-10	Textiles - Determination of thickness of textiles and textile products	M
ISO 1763 1986-11	Carpets; Determination of number of tufts and/or loops per unit length and per unit area	M
ISO 1766 1999-10	Textile floor coverings - Determination of thickness of pile above the substrate	M
DIN EN 1969 2000-08	Surfaces for sports areas - Determination of thickness of synthetic sports surfaces	M
ISO 2549 1972-08	Hand-knotted carpets; Determination of tuft leg length above the woven ground including Corrigendum von 12-1990	M
ISO 8543 1998-05	Textile floor coverings - Methods for determination of mass	M
DIN EN 430 1994-11	Elastic Floor Coverings - Determination of mass by area (*withdrawn standard*)	M

5 Durability-, authenticity- and environmental tests

5.1 Durability and fastness against ageing caused by environmental influences of laquer- or other material surfaces, textiles, components and component constituents, predominantly for the use in motor vehicle interior *

Type of test	Measurand/ test parameter	Load range	smallest attainable measurement uncertainty	Characteristic test processes
Colour and Colour change measurement	Colorimetric quantity (CIE 1976) Lightness L* Coordinates a*/b* Distance ΔL*/Δa*/Δb* Colour difference: ΔE*	Geometry of the measurement 0°/45° Illmuninant D65 10° Normal observer Measuring field diameter 16/8/4 mm	Colorimetric quantity (L*/a*/b*) 0,52% Distance (ΔL*/Δa*/Δb*) 0,2 Colour difference: (ΔE*) 0,38	VW 50190 VDA 280-1 DIN EN ISO 105-A05

Type of test	Measurand/ test parameter	Load range	smallest attainable measurement uncertainty	Characteristic test processes
Gloss measurement	Gloss value	Geometry of the measurement 20°/60°/85° 0 GU – 100 GU 100 GU – 500 GU	 Gloss value 0,63 GU Gloss change 0,24 GU Gloss value 5GU	VW 50190 DIN EN ISO 2813
Visual evaluation of colour change	Grey scale	1 note – 5 note	0,5 note	DIN EN 20105-A02 DIN EN 20105-A03

DIN EN-20105-A02 1994-10	Textiles - Tests for colour fastness - Part A02: Grey scale for assessing change in colour (ISO 105-A02:1993)	M H
DIN EN 20105-A03 1994-10	Textiles - Tests for colour fastness - Part A03: Grey scale for assessing staining (ISO 105-A03:1993)	M
DIN EN ISO 105-A04 1999-10	Textiles - Tests for colour fastness - Part A04: Method for the instrumental assessment of the degree of staining of adjacent fabrics	M
DIN EN ISO 105-A05 1997-07	Textiles - Tests for colour fastness - Part A05: Instrumental assessment of change in colour for determination of grey scale rating	M H
DIN 5033-1 2009-05	Colorimetry; Basic terms of colorimetry	M H
DIN 6167 1980-01	Description of yellowness of near-white or near-colourless materials	M H
SAE J1767 2014-01	Instrumental Color Difference Measurements for Colorfastness of Automotive Interior Trim Materials	M H
VDA 280-1 2001-04	Colorimetry for motor vehicles - Colour measuring of plastic surfaces of interior materials for motor vehicles	M H
VDA 280-3 2001-04	Colorimetry for motor vehicles - Colour measuring of motor vehicle varnishing (solid-paints)	M H
VW 50190 2011-01	Interior Trim Components Metrological Evaluation of Color and Gloss Level Visual Evaluation of Chrome Surfaces	M H

ASTM D523 2008	Standard Test Method for Specular Gloss	M H
DIN 67530 1982-01	Reflectometer as a means for gloss assessment of plane surfaces of paint coatings and plastics (*withdrawn standard*)	M H
DIN EN ISO 2813 2012-10	Paints and varnishes - Determination of gloss value at 20°, 60° and 85°	M H
DIN EN ISO 4628-1 2004-01	Paints and varnishes - Valuation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 1: General introduction and designation system	M H
DIN EN ISO 4628-2 2004-01	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering	M H
DIN EN ISO 4628-3 2004-01	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting	M H
DIN EN ISO 4628-4 2004-01	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 4: Assessment of degree of cracking	M H
DIN EN ISO 4628-5 2004-01	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 5: Assessment of degree of flaking	M H

5.2 Fastness and durability of laquer- or other material surfaces and textiles against mechanic exposures as rubbing and scratching as well as with contact with test media or with pollution and cleaning *

Type of test	Measurand/ test parameter	Load range	smallest attainable measurement uncertainty	Characteristic test processes
Colour fastness, durability and scratch resistance against abrasion(linearly alternate motion)	Number of cycles Friction path Frequency Force Test stamp	0,5 – 10 X 30 – 104 mm 0 – 90 cycles/min 1 N – 25 N Rubbing device with diameter 8 mm – 20 mm Chisel with width 8 mm – 20 mm Radius 0,16 mm – 45 mm	 1 mm 0,2 N (at 9 N)	DIN EN ISO 105-X12 DBL 5306 § 3.2
Colour fastness and durability against rubbing and fluff creation with Martindale method	Measuring surface and Abrasion figure Testing force	Lissajous (abrasion) 60,5 mm Lissajous (Pilling) 24,0 mm Load Abrasion 9 / 12 KPa Pilling 155 /260 / 815 g	 0,5 mm 0,5 mm 0,1 KPa 1 g	DIN EN ISO 12947-1 DIN EN ISO 12945-2
Durability against abrasion with fingers and hands (Xb); Dry or with test liquids	Stroke rate Friction path and frequency Testing speed Press-on force Hardness of test stamp	1 – 10 X 4 mm – 40 mm at 2,0 – 0,6 cycles/s 60 mm/s 1 N – 20 N Shore A 47 (Typ 20 mm; 10 mm)	 0,5 mm 0,1 cycles/s 5 mm/s 20 % 5 Shore A	DIN EN 60068-2-70 BMW GS 97034-1
Durability against scratching using instrumental cross cut test	Testing distance Cut distance Test speed Test load	40 mm 0,5 mm – 40 mm 17 - 40 mm/s 1 N – 40 N	 0,05 mm 5 % 5 %	VW PV 3952 BMW GS 97034-9

DIN EN ISO 105-X12 2002-12	Textiles - Tests for colour fastness - Part X12: Colour fastness to rubbing	M
Daimler DBL 5306 § 3.2 2008-12	General technical delivery conditions and test methods for interior equipment materials and similar products; § 3.2: Scratch exposure of surface using a chisel	M

DIN EN ISO 12945-2 2000-11	Textiles - Determination of fabric propensity to surface fuzzing and to pilling - Part 2: Modified Martindale method	M
DIN EN ISO 12947-1 2007-04	Textiles - Determination of the abrasion resistance of fabrics by the Martindale method - Part 1: Martindale abrasion testing apparatus	M
DIN EN ISO 12947-2 2007-04	Textiles - Determination of the abrasion resistance of fabrics by the Martindale method - Part 2: Determination of specimen breakdown	M
DIN EN ISO 12947-3 2007-04	Textiles - Determination of abrasion resistance of fabrics by the Martindale method - Part 3: Determination of mass loss	M
DIN EN ISO 12947-4 2007-04	Textiles - Determination of abrasion resistance of fabrics by the Martindale method - Part 4: Assessment of appearance change	M
BMW PR 360 2017-02	Abrasion using taber	M
DIN EN ISO 17076-1 2012-06	Leather - Determination of abrasion resistance - Part 1: Taber method	M
FLTM BN 108-02 2017-07	Resistance to Abrasion - Taber Abrasion	M
GMW 2308 2017-09	Rotary Abrasion Test, Taber Type	M
SAE J365 2012-05	Method of testing resistance to scuffing of trim materials	M
DIN EN 60068-2-70 1996-07	Environmental testing - Part 2-70: Tests - Test Xb: Abrasion of markings and letterings caused by rubbing of fingers and hands	M
BMW AA-0471 2011-11	Abrasion Resistance using the Abrex test Equipment	M
BMW GS 97034-1 2012-02	Surface test of motor vehicle interior materials Manual abrasion test	M
BMW GS 97034-2 2007-05	Surface test of motor vehicle materials Finger nail test	M

BMW GS 97034-3 2007-05	Surface test of motor vehicle interior materials Shoe sole test	M
BMW GS 97034-4-A 2007-05	Surface test of motor vehicle interior materials Color abrasion behavior; Abrex	M
BMW GS 97034-4-B 2007-05	Surface test of motor vehicle interior materials Color abrasion behavior; Crockmeter	M
BMW GS 97034-5-A 2007-05	Surface test of motor vehicle interior materials Resistance to cleaning agents; Abrex	M
BMW GS 97034-5-B 2007-05	Surface test of motor vehicle interior materials Resistance to cleaning agents; Crockmeter	M
FLTM BN 155-01 2008-10	Ford; Resistance to Simulated Finger Tip Abrasion	M
BMW GS 97034-6 2007-05	Surface test of motor vehicle interior materials Soiling behavior and cleaning ability	M
BMW GS 97034-8 2008-02	Surface test of motor vehicle interior materials Determination of the scratch inclination	M
BMW GS 97034-9 2008-02	Surface test of motor vehicle interior materials Scratch test	M
DIN EN ISO 2409 2013-06	Paints and varnishes - Cross-cut test	M H
DIN EN ISO 2812-2 2007-05	Paints and varnishes - Determination of resistance to liquids - Part 2: Water immersion method	M
DIN EN ISO 2812-4 2007-05	Paints and varnishes - Determination of resistance to liquids - Part 4: Spotting methods	M
DIN ISO 1817 2008-08	Rubber, vulcanized or thermoplastic - Determination of the effect of liquids	M
DIN EN ISO 175 2011-03	Plastics - Methods of test for the determination of the effects of immersion in liquid chemicals	M
DIN 53863-2 1979-02	Testing of textiles; abrasion test methods for textile fabrics, rotary abrasion test	M

GMW 3283 2016-08	Schopper Abrasion Wear Test	M
VW PV 3353 2004-01	Vehicle Interior Trim Surfaces (Soiling and Cleaning Behavior)	M
VW PV 3907 1999-09	Textiles - Brush Abrasion Test	M
VW PV 3908 2014-05	Textiles, Carpets Wear Resistance	M
FLTM BI 106-01 2010-03	Ford; Coating Adhesion Test	M
GMW 14698-A 2012-08	GM; Scratch Resistance of Organic Coatings and Selfadhesive foils, Method A (Hardness Test Rod Type 318 from Erichsen GmbH & Co. KG)	M
GMW 14829 2012-10	GM; Tape Adhesion Test for Paint Finishes	M
VW PV 3952 2002-08	Plastic Interior Components Testing of Scratch Resistance	M
VW TL 226 § 3.7.2 2013-08	Paintworks on Materials Used in the Vehicle Interior Trim - Cross-cut-test (St. Andrew's cross)	M
GMW 3405 2009-05	Seam Fatigue for Automobile Textiles	M
FLTM BN 106-02 2013-08	Seam Fatigue Testing	M
Daimler DBL 5416 2011-02	Supply Specification - Parts Manutactured from Thermoplastics for Paneling, Housings and Functional Parts for External Applications A.3.3 (Layer thickness at all surface locations) A.3.5.2 (St Andrews cross with scratch test) A.3.5.3 (St Andrews cross with adhesive tape application and removal) A.3.5.1 (Scratch test)	H
Daimler DBL 7392 2009-01	Supply specification - Coating/varnishing for parts with moderate corrosion stress; § 5.2: Scratching with a knife	H

Daimler DBL 7399 1997-10	Supply specification - Enamels, paints and similar coating materials and associated coatings; § 5.1: Scratching with knife	H
BMW AA- 0180 2010-05	Cross hatch testing	H
BMW AA-P 177 2008-11 (outworn)	Cross hatch testing	H
BMW PA-P 028 2002-12 (outworn)	Cross hatch testing	H
VW TL 226 2013-08	Paint Coating on Materials used in the Vehicle Interior Trim - Requirements § 3.7.1 (Cross hatch testing) § 3.7.2 (St. Andrew's cross)	H
Porsche PTL 5522 1994-06	Painting of Non-Metallic Materials for interiors § 3.3.3 Scratch test/ Scrap test	H
Jaguar TPJLR.52.061 2009-12	Jaguar Cars & Landrover: Paint Adhesion Test Method	H
GM/ Opel GME 60402 2002-6	Determining the scratch resistance of organic coating (Erichsen hardness tester, model 318)	H
GM/ Opel GMW 14698- A 2012-8	Scratch resistance of organic coatings and self-adhesive foils; Method A: Erichsen Hardness Test Rod type 318	H

5.3 Colour fastness and durability of laquer- or other material surfaces against artificial light and weathering with xenon lamps *

Type of test	Measurand/ test parameter	Load range	smallest attainable measurement uncertainty	Characteristic test processes
Colour fastness tests and colour fastness to artificial light	Irradiance	1,1 – 3,6 $W/m^2_{(420\ nm)}$ 45 – 162 $W/m^2_{(300-400nm)}$) 70 – 90 $W/m^2_{(300-400\ nm))}$ 0 + 0,55 $W/m^2_{(340\ nm)}$	2 W/m^2 (300 – 400 nm) 0,01 W/m^2	DIN EN ISO 105-B06 (3) DIN EN ISO 105-B06 (1) DIN EN ISO 105-B06 (5)

Type of test	Measurand/ test parameter	Load range	smallest attainable measurement uncertainty	Characteristic test processes
Colour fastness tests and colour fastness to artificial light	Temperature Black-standard (BST) Black-panel (BPT)	90 / 100 / 115°C (BST) 38 + 89°C (BPT)	3 K 2 K	DIN EN ISO 105-B06 (3)(1) DIN EN ISO 105-B06 (5)
	Test chamber temperature	48 / 65 °C 38 + 63 °C	3 K 2 K	DIN EN ISO 105-B06 (1)(3) DIN EN ISO 105-B06 (5)
	Humidity, rel.	0 - 30 % r.H. 95 + 50 % r.H.	5 % r.H. 5 + 10 r.H.	DIN EN ISO 105-B06 (1)(3) DIN EN ISO 105-B06 (5)
Colour fastness and Durability against weathering (weather Fastness)	Irradiance	60 W/m² (300-400nm) 75 W/m² (300-400nm)		VW PV3930/PPV4014-B VW PV3929/PPV4014-A
	Temperature Black-standard (BST)	65°C 90°C	2 K 2 K	VW PV3930/PPV4014-B VW PV3929/PPV4014-A
	Test chamber temperature	38°C 50°C	2 K 2 K	VW PV3930/PPV4014-B VW PV3929/PPV4014-A
	Humidity, rel.	70% r.H. (dry phase) 20% r.H.	10% r.H. 10% r.H.	VW PV3930/PPV4014-B VW PV3929/PPV4014-A

DIN EN ISO 105-B06 2004-07	Textiles - Tests for colour fastness - Part B06: Colour fastness and ageing to artificial light at high temperatures: Xenon arc fading lamp test	M H
VDA 75202 2001-08	Color fastness and aging behaviour against light by high temperature	M H
DIN EN ISO 4892-2: 2013-06	Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps	M H
GMW14162 2011-06	GM Test Procedure - Colorfastness to Artificial Weathering	M H
PPV 4014 / VW 96378 2006-08	Exterior - Weathering of nonmetallic materials Testing in dry, hot climate/ in humid, warm climate	H
VW PV 3929 2008-03	Weathering in dry, hot climate	H
VW PV 3930 2008-03	Weathering in humid, warm climate	H

BMW PR 231 § 2.2.13.4 (Kalahari-Mode) 2013-02	Simulated Weathering: dry-hot climate / Kalahari-mode	H
BMW PR 231 § 2.2.13.5 (Florida-Mode) 2013-02	Simulated Weathering: humidity-warm climate / Florida-mode	H
DBL 5578, Tab. 2, 4.12.4 / LV 28 (Florida Mode and Kalahari-Mode) 2007-11	Supply Specification - Elastomer parts with anti-friction coating; Table 2, 4.12.4: Artificial weathering - Exterior application - Kalahari mode and Florida mode	H
Volvo STD 1026,8242 2009-04	Organic Materials - Colour fastness to artificial light at 100 °C	M
SAE J2412 2004-05	Accelerated Exposure of Automotive Interior Trim Components Using a Controlled Irradiance Xenon-Arc Apparatus	M
VW PV 1303 2001-03	Non-Metallic Materials Exposure Test of Passenger Compartment Components	M H

5.4 Environmental tests with temperature, humidity, sun simulation (halogenide-emitter), mechanical endurance and in combination (qualification tests) on pre- and end-products as well as automobile industry components *

Type of test	Measurand/ test parameter	Range of performance	smallest attainable measurement uncertainty	Characteristic test processes
Environmental simulation using climate tests	Test chamber volume	Climate cycle and temperature 0,2 - 46 m^3		DIN EN 60068-2-1 DIN EN 60068-2-2 DIN EN 60068-2-14 DIN EN 60068-2-30 VW PV 1200 VW PV 2005 BMW PR 308.2 BMW PR 303.5
	Temperature	Climate (-40°C) to +10 °C to + 120 °C Cold/ Warmth -70 °C to +300 °C	In usable volume 0,5 K 1,5 K/0,3 K (at 40°C) Measuring point/ Sensor 0,19 K	
	Humidity	10 to 95 % r.H.	0,5 % - 1,5 % r.H.	

Type of test	Measurand/ test parameter	Range of performance	smallest attainable measurement uncertainty	Characteristic test processes
Length measurement including optical component measurement	Length	Micrometer gauge 0 mm – 25 mm Slide gauge 0 mm – 150 mm 0 mm – 500 mm Metal rule 0 mm – 300 mm 0 mm – 1000 mm Feeler gauge 0,05 mm – 2 mm Steel rule 0 - 50 m	 0,01 mm 0,08 mm 0,2 mm 0,55 mm 1,5 mm 0,029 – 0,048 mm 10 mm	
		Optical component measurement 0,2m - 5 m	 0,01 mm	TD_G_CB_FR_5.4_176_G_0
Angle measurement	Angle	0 – 180 °	0,1 % (digital) 1 %	
Force measurement	Assembling-, Disassembling - Force	0 - 100 N	0,02 N	
Sun simulation with metal-halogenide lamps	Irradiance	550 - 1100 W/m^2 (280 nm to 3.000 nm)	50 W/m^2	DIN 75220

DIN 75220 1992-11	Ageing of automotive components in solar simulation units	M H
BMW PR 306.5 2014-04	BMW Prüfvorschrift TS 306.5 - Solar Simulation for Trim Parts	H
DIN EN ISO 6270-2 2005-09	Paints and varnishes - Determination of resistance to humidity - Part 2: Procedure for exposing test specimens in condensation-water atmospheres	H
BMW PR 303.5 2010-01	Alternate climate test for trim parts	M H
BMW PR 308.2 2006-04	Climatic Test for bonded joints and composite materials on trim parts	M H

TPJLR.52.353 2011-02	Accelerated Environmental Ageing	M
Porsche PPV 4015 2006-04	Testing of Attachment Parts; Alternate Climate Test	M H
VW PV 1200 2004-10	Testing of Resistance to Environmental Cycle Test (+80/-40) °C	M H
VW PV 2005-A 2000-09	Testing of Resistance to Environmental Cycle Test - Variant A Single Parts	M H
GMW 14124 Test Cycle T 2012-07	Automotive Environmental Cycles	M
DIN EN ISO 2440 2015-02	Flexible and rigid cellular polymeric materials - Accelerated ageing tests	M
DIN EN 60068-2-1 2008-01	Environmental testing - Part 2: Tests - Test Group A: Cold	M H
DIN EN 60068-2-2 2008-05	Environmental testing - Part 2: Tests - Test Group B: Dry heat	M H
DIN EN 60068-2-14 2010-04	Environmental testing - Part 2: Tests; test N: Change of temperature	M H
DIN EN 60068-2-30 2006-06	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	M H
TD_G_CB_FR_5.4_176_G_0 2014-11	Test Equipment Instruction - Visual Component Measuring (Test Equipment Instruction)	H
VDA 237-101 1996-01	Test procedures for foils and artificial leather; Appendix 3: Ball drop test	H
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts) A 4.6 (Cold resistance)	H
VW PV 3905 2005-09	Organic materials - Ball drop test	H

Jaguar TPJLR.52.709 2009-10	Jaguar Cars & Landrover; Resistance to Low Temperature Impact Method A (rubber ball) and Method B (steel ball)	H
Ford FLTM BO 151-01 2006-06	Resistance to low temperature impact (Ball drop test) Method A (rubber ball) Method B (steel ball)	H

5.4.1 Measurement of coating thickness

DIN EN ISO 2360 2004-04	Non-conductive coatings on non-magnetic electrically conductive basis materials - Measurement of coating thickness - Amplitude-sensitive eddy current method	H

5.4.2 Infrared test

GM/ Opel GMW 15432 2012-05	Irradiation Testing	H

5.5 Resistance of paint or other surfaces material to mechanical stress like stone impact or steam jet

5.5.1 Stone impact test *

DIN EN ISO 20567-1 2014-11	Paints and varnishes - Determination of stone-chip resistance of coatings - Part 1: Multi-impact testing	H
BMW AA-0079 2014-09	Determination of multi impact stone chip resistance	H
Daimler DBL 5416 2011-2	Supply Specification - Parts Manufactured from Thermoplastics for Paneling, Housings and Functional Parts for External Applications A.3.6 (Multi impact stone chip resistance test for topcoated parts) Appendix D	H
VW PV 3.14.7 2010-02	Test of Stone-Chip Resistance	H

5.5.2 steam jet test *

DIN EN ISO 16925 2014-06	Paints and varnishes - Determination of the resistance of coatings to pressure water-jetting	H
Daimler DBL 5416 2011-2	Supply Specification - Parts Manufactured from Thermoplastics for Paneling, Housings and Functional Parts for External Applications A.3.9 (Steam jet test for topcoated and primed parts)	H
BMW AA- 0136 2015-3	Steam jet test- Testing of resistance to pressure water jetting	H
VW PV 1503 2008-05	Paint coating of metallic an non-metallic materials - Pressure washer test	H

5.6 Ageing / environmental simulation tests at metallic and non-metallic materials and component parts as well as its evaluation

5.6.1 Corrosion test *

DIN EN ISO 4628-1 2004-01	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 1: General introduction and designation system	H
DIN EN ISO 4628-2 2004-01	Beschichtungsstoffe - Beurteilung von Beschichtungsschäden - Bewertung der Menge und der Größe von Schäden und der Intensität von gleichmäßigen Veränderungen im Aussehen - Teil 2: Bewertung des Blasengrades	H
DIN EN ISO 4628-3 2004-09	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting	H
DIN EN ISO 4628-4 2004-09	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 4: Assessment of degree of cracking	H

DIN EN ISO 4628-8 2013-03	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 8: Assessment of degree of delamination and corrosion around a scribe or other artificial defect	H
DIN EN ISO 6270-2 2005-9	Paints and varnishes - Determination of resistance to humidity - Part 2: Procedure for exposing test specimens in condensation-water atmospheres	H
DIN EN ISO 9227 2012-09	Corrosion tests in artificial atmospheres - Salt spray tests	H
DIN EN ISO 11997 2006-04	Paints and varnishes - Determination of resistance to cyclic corrosion conditions - Part 1: Wet (salt fog)/dry/humidity	H
ASTM B 117 2011	“Standard Practice for Operating Salt Spray (Fog) Apparatus”- Saltspray-test	H
Daimler DBL 5416 2011-2	Supply Specification - Parts Manufactured from Thermoplastics for Paneling, Housings and Functional Parts for External Applications A.3.7 (Condensation water constant atmosphere)	H
Daimler DBL 7392 2009-01	Supply specification - Coating/varnishing for parts with moderate corrosion stress §5.8 Condensation water constant atmosphere §5.9 Saltspray-test §5.10 Cyclic corrosion test	H
BMW AA-0213 2015-04	Condensation water constant atmosphere test	H
BMW PA-P 208 2004-05	Condensation water constant atmosphere test	H
BMW AA- 0324 2014-11	Saltspray-test	H
BMW AA-0224 2015-06	Cyclic corrosion test	H

VW TL 226 2013-08	Paint Coating on Materials used in the Vehicle Interior Trim - Requirements § 3.11.1 (Condensation water constant atmosphere) § 3.11.2 (Cyclic corrosion test (only for paint coated metallic raw material))	H
Jaguar TPJLR.52.351 2011-02	Jaguar Cars & Landrover: Resistance to Humidity	H
Daimler DBL 7392 2009-01	Supply specification - Coating/varnishing for parts with moderate corrosion stress; § 5.7 - Evaluation of degree of rusting, edge corrosion	H

6 Sports functional, protective and technological tests from synthetic turf's covering and synthetic turf systems ***

DIN EN 1367-1 2007-06	Tests for thermal and weathering properties of aggregates - Part 1: Determination of resistance to freezing and thawing	M
DIN EN 933-1 2012-03	Tests for geometrical properties of aggregates - Part 1: Determination of particle size distribution - Sieving method	M
DIN EN 933-4 2008-09	Tests for geometrical properties of aggregates - Part 4: Determination of particle shape - Shape index	M
DIN EN 14955 2006-01	Surfaces for sports areas - Determination of composition and particle shape of unbound mineral surfaces for outdoor sports areas	M
E DIN 18035-7 2013-06	Sports grounds - Part 7: Synthetic turf areas Par. 6.6 Ageing by Xenon Radiation (*withdrawn standard*)	M
E DIN 18035-7 2013-06	Sports grounds - Part 7: Synthetic turf areas Abs. 6.7 Stress through hot Water and Heat (*withdrawn standard*)	M
DIN 53477 1992-11	Testing of plastics; determination of particle size distribution of moulding materials by dry sieving analysis	M

DIN EN 1097-3 1998-06	Tests for mechanical and physical properties of aggregates - Part 3: Determination of loose bulk density and voids	M

Abbreviations used:

ASTM	American Society for Testing and Materials
BGI	Berufsgenossenschaftliche Informationen - Maßnahmenkatalog zur Berufssicherheit
BIA	Berufsgenossenschaftliches Institut für Arbeitssicherheit
BMW AA	BMW Arbeitsanweisung
BMW GS	BMW Group Standard
BMW PR	BMW Prüfvorschrift
DBL	Daimler Benz Liefervorschrift
DIN	Deutsches Institut fur Normung e.V.
EN	Europäische Norm
FIFA	Federation Internationale de Football Association
FLTM	Ford Laboratory Test Method
FMVSS	Federal Motor Vehicle Safety Standard
GMW	General Motors Worldwide
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
Hyundai MS	Hyundai Material Specification
Porsche PPV	Porsche Prüfvorschrift
RAL	Deutsches Institut für Gütesicherung und Kennzeichnung e. V.
SAA	Standard-Arbeitsanweisung der imat-uve gmbh
SOP	Standard Operating Procedure
Suzuki SES N	Suzuki Engineering Standard
TPJLR	Test Procedure Jaguar and Land Rover
VDA	Verband der Automobilindustrie e.V.
VDI	Verein Deutscher Ingenieure
VDLUFA	Verband Deutscher Landwirtschaftlicher Untersuchungs- und Forschungsanstalten
VW PV	Volkswagen Prüfvorschrift
VW TL	Volkswagen Technische Lieferbedingungen