

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-20658-01-00  
according to ISO/IEC 17025:2005

Period of validity: 13.06.2018 to 12.06.2023

Date of issue: 13.06.2018

Holder of certificate:

**IMAT Shenyang Automotive Technology Co. Ltd.**  
**G8-G6/7 Guizhuxiang street, Sujiatun District,**  
**110100 Shenyang, Liaoning province**  
**P.R. CHINA**

Tests in the fields:

**Temperature, humidity, solar simulation and in their combination environmental simulation tests (qualification tests), measurements of gloss, color and three-dimensional deformation of technical products**

Abbreviations used: see last page

**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.**

## 1 Colour fastness and environmental tests

### 1.1 Colour 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 $\Delta L^*/\Delta a^*/\Delta b^*$ Colour difference: $\Delta E^*$	Geometry of the measurement 0°/45° Illuminant D65 10° Normal observer Measuring field diameter 11 mm	Colorimetric quantity (L*/a*/b*) 0,52% Distance ( $\Delta L^*/\Delta a^*/\Delta b^*$ ) 0,2 Colour difference: ( $\Delta E^*$ ) 0,38	VW 50190 DIN EN ISO 11664-4 DIN EN ISO 105-A05
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 ISO 11664-4  
2012-06

Colorimetry - Part 4: CIE 1976 L\*a\*b\* Color space

DIN 6174  
2007-10

Colorimetric evaluation of colour coordinates and colour differences to the approximated uniform CIELAB colour space  
(*withdrawn standard*)

VW 50190  
2011-01

Components of the vehicle interior trim - Colorimetric evaluation  
(here only: *colour*)

VW 50190  
2006-10

Components of the vehicle interior trim - Colorimetric evaluation  
(here only: *colour*)

VW 50195  
2002-11

Colorimetric Evaluation of Automobile Paint Coatings § 3.2.1 Solid paint

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DIN EN ISO 4628-1 2016-07	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
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 <i>(withdrawn standard)</i>
DIN EN 20105-A02 1994-10	Textiles - Tests for colour fastness - Part A02: Grey scale for assessing change in colour
ISO 105-A02 1993-09	Textiles - Tests for colour fastness - Part A02: Grey scale for assessing change in colour
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
DIN EN ISO 2813 2015-02	Paints and varnishes - Determination of specular gloss of non-metallic coatings with 20°, 60° and 85° (according to JIS K 5400 & MS & MS 652-14 600-60)
DIN EN ISO 2813 1999-06	Paints and varnishes - Determination of specular gloss of non-metallic coatings with 20°, 60° and 85° (according to JIS K 5400 & MS & MS 652-14 600-60) <i>(withdrawn standard)</i>
DIN 67530 1982-01	Reflectometer as a means for gloss assessment of plane surfaces of paint coatings and plastics <i>(withdrawn standard)</i>

## 1.2 Environmental tests with temperature, humidity, solar simulation 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 1,5 - 46 m <sup>3</sup>		DBL 5471 DIN EN 60068-2-14 DIN EN 60068-2-30 PV 1200 PV 2005 BMW PR 308.2 BMW PR 303.5
	Temperature	Climate (-40°C) to +10 °C to + 120 °C  Cold/ Warmth -40 °C to +150 °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.	
Sun simulation with metal-halogenide lamps	Irradiance	550 - 1100 W/m <sup>2</sup> (280 nm to 3.000 nm)	50 W/m <sup>2</sup>	DIN 75220 PR 306.5
Length measurement	Length	Micrometer gauge 0 mm - 25 mm	0,01 mm	
		Slide gauge 0 mm - 150 mm	0,08 mm	
		Metal rule 0 mm - 300 mm	0,55 mm	
		0 mm - 1000 mm	1,5 mm	
		Feeler gauge 0,05 mm - 2 mm	0,029 - 0,048 mm	
		Steel rule 0 - 50 m	10 mm	

DIN EN 60068-2-14  
2010-04

Environmental testing - Part 2-14: Tests - Test N: Change of temperature; § 8: Test Nb: Changes of temperature with specified rate of change

DIN EN 60068-2-30  
2006-06

Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)

DIN EN ISO 9142  
2004-05

Adhesives - Guide to the selection of standard laboratory ageing conditions for testing bonded joints - Cycle D2: Heat, cold (thermal shock) and moisture cycle

BMW PR 303.5  
2010-01

Climate cycle test for equipment parts

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BMW PR 308.2 2006-04	Climatic testing of adhesive joints and material bonds of equipment parts
BMW AA-P 276 2006-05	Temperature Cycle Test
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § 4.1.2 Dry-warm/humid-cold (warm climate cycle test B) + 4.3 color change
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § 4.1.3 Dry-hot/humid-cold (hot climate cycle test) + 4.3 color change
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § 4.1.1 Dry-warm/humid-cold (warm climate cycle test A) + 4.3 color change
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § -4.2.4 Humid-warm ageing + 4.3 color change
Daimler DBL 9202 2013-01	Supply Specification Decorative Parts in Vehicle Interiors; § 9.1 Thermal cycling 1 - TWT 1
Daimler DBL 9202 2013-01	Supply Specification Decorative Parts in Vehicle Interiors; § 9.2 Thermal cycling 1 - TWT 2
Daimler DBL 9202 2013-01	Supply Specification Decorative Parts in Vehicle Interiors; § 9.7 Alternating climate test - KWT AKLV steering wheel
Daimler DBL 9202 2013-01	Supply Specification Decorative Parts in Vehicle Interiors; § 9.8 Accelerated test
VW PV 2005-A 2000-09	Vehicle parts - Testing of resistance to environmental cycle test; Variant A: single parts
VW PV 1200 2004-10	Vehicle parts - Testing of resistance to environmental cycle test (+80/-40) °C
VW TL 203 2015-02	Electroplated Ni-Cr coatings - Requirements for surface protection; § 3.4d: Resistance to temperature cycling

GM/Opel GMW 14124 2012-07	Automotive Environmental Cycles <ul style="list-style-type: none"> <li>- Test cycle H: Dimensional stability test cycle</li> <li>- Test cycle M: Interior trim dimensional stability cycle</li> <li>- Test cycle P: Covered door panel delamination/dimensional stability cycle</li> <li>- Test cycle R: Shrinkage of upholstery materials used for wrapping instrument panels (IP) and rear window trim (RWT)</li> <li>- Test cycle S: Accelerated ageing of leather and plastic rolled goods</li> <li>- Test cycle W: Interior adhesive/sealant humidity high temperature test cycle</li> </ul>
GM/Opel GMW 14124 2010-11	Automotive Environmental Cycles <ul style="list-style-type: none"> <li>- Test cycle M: Interior trim dimensional stability cycle</li> <li>- Test cycle P: Covered door panel delamination/dimensional stability cycle</li> </ul>
Porsche PPV 4015 2006-04	Exterior - Test of add-on parts - Climate cycle test
VW 96379 2006-04	Exterior - Test of add-on parts - Climate cycle test
Porsche PPV 5002 2016-11	Leather - Determination of shrinkage behavior
Porsche PPV 5002 2006-02	Leather - Determination of shrinkage behavior
VW 96395 2016-11	Leather - Determination of shrinkage behavior
VW 96395 2006-02	Leather - Determination of shrinkage behavior
Ford FLTM BQ 104-07 2000-11	Environmental Test Cycles (only procedures: 1 to 6)
Renault RT D45 1564 2005-04	Textiles - Dimensional variations in humidity
Renault D47 1309 2007-03	Automobile equipment trimming materials and parts - Ageing according to given climatic cycle

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Renault RT 1309 1995-04	Trim materials and parts - Ageing by a given climatic cycle
PSA D47 1309 2008-11	PSA Peugeot - Citroen: Materials and parts for automotive equipment - Ageing according to a given climatic cycle
PSA D47 1309 2006-09	PSA Peugeot - Citroen: Materials and parts for automotive equipment - Ageing according to a given climatic cycle
TPJLR 52.360 2015-02	Accelerated Environmental Ageing for Adhesives Used in Trim Applications
TPJLR.52.356 2005-08	Jaguar Cars & Land Rover: High heat & humidity ageing (climate cycle)
ASTM D5427 2003-10	Standard practice for accelerated ageing of inflatable restraint fabrics; § 8.4: Cycle aging
ASTM D5427 2009-01	Standard practice for accelerated ageing of inflatable restraint fabrics; § 8.4: Cycle aging
DIN 75220 1992-11	Ageing Automobile Components in Solar Simulation Units - D: (Long term Testing) - Z: (cycle Test)
VDA 230-219 2011-10	Ageing of automotive components in solar simulation units - D: (long term testing) - Z: (cycle testing)
BMW PR 306.5 2014-04	Solar simulation for trim parts - part a: Instrument panel and rear shelf - part b: Door trim panel - part c: Test behind horizontal glass pane - part d: Other interior components - part e: Exterior add-on parts - part f: Complete vehicle
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § -4.4 Solar simulation
Daimler FuVo_A_0010060099_DE_20 10_02_ZGS001	Function Specification Instrument Panel Assembly; - § 3.1.1 Solar Simulation DIN 75220 (SoSi) - Indoor Solar Simulation - § 3.1.2 Solar Simulation DIN 75220 (SoSi) - Outdoor Solar Simulation

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DIN EN 60068-2-78 2002-09	Environmental testing Part 2-78: Tests - test Cab: Damp heat, steady state ( <i>withdrawn standard</i> )
ISO 2796 1986-08	Cellular plastics, rigid - Test for dimensional stability
BMW AA-0203 2011-07	Hydrolysis test
BMW AA-P 308 2007-06	Hydrolysis test
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § -4.2.4 + 4.3 - Humid-warm ageing + color change
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § -4.2.4 + 4.3 - Humid-warm ageing + color change
Daimler DBL 9202 2013-01	Supply Specification Decorative Parts in Vehicle Interiors; § 9.6 Climate storage 2 - KL
VW TL 226 2016-10	Paintwork on Materials of Vehicle Interior Equipment; 3.7 Table 3 section 5.3: Hydrolysis aging
GM/Opel GMW 14124 2012-07	Automotive Environmental Cycles; Test cycle Q: Ageing condition for bond strength and hydrolytic stability of laminated textile materials
Renault D47 1997-05	Plastics and products applied to the body in white or coated in paint - Accelerated ageing - climate storage (constant climate)
PSA D47 1165 2006-07	PSA Peugeot - Citroen: Products applied to body-in-white or paint coated body, plastics - Accelerated ageing; only methods N / R / W / X (climate storages)
Daimler DBL 5306 2008-12	General technical delivery conditions and test methods for interior equipment materials and similar products; § 7.3: Cold resistance - ball drop test
DIN 53100 2007-06	Metallic coatings - Electroplated coatings of nickel plus chromium and of copper plus nickel plus chromium on plastics materials; § 7.5: Thermal cycle test (appendix D)



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DIN 53497 2017-04	Testing of plastics - Heat storage test of moulded articles made of thermoplastic moulding materials without outside mechanical stress - Method A: constant storage period - Method B: constant temperature
BMW AA-0026 2014-12	Ageing resistance test - Scope Exterior
BMW AA-0026 2011-09	Ageing resistance test - Scope Exterior
BMW AA-P 275 2006-05	Ageing resistance test
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § 4.2.2 + 4.3 - Dry-warm endurance test B (warm temperature test + color change
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § 4.2.3 + 4.3 - Dry-hot endurance test (heat test) + color change
Daimler DBL 5471 2007-05	Supply specification - trim panels and molded padded parts for vehicle interiors (compound parts); § 4.2.1 + 4.3 - Dry-warm endurance test A (warm temperature test) + color change
Daimler DBL 5306 2008-12	General technical delivery conditions and test methods for interior equipment materials and similar products; § 6.1: Heat resistance - Loose exposure
Daimler DBL 9202 2013-01	Supply Specification Decorative Parts in Vehicle Interiors  - § 9.3 Hot storage 1 - WL 1 - § 9.4 Hot storage 2 - WL 2 - § 9.5 Hot storage 3 - WL 3
VW TL 226 2016-10	Paintwork on Materials of Vehicle Interior Equipment - 3.7 Table 3 section 4.1: Dimensional stability under heat in a forced-air oven
VW PV 3355 2014-10	PVC-parts contact heat storage
TPJLR.52.352 2011-02	Jaguar Cars & Land Rover: Resistance to heat ageing

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TPJLR.52.301 2004-09	Jaguar Cars & Land Rover: Dimensional stability under humidity and dry heat, Index J and K: Procedure for dry heat
Renault D47 1165 1997-05	Plastics and products applied to the body in white or coated in paint - Accelerated ageing - heat storage (constant temperature)
Renault D47 1234 2010-02	Renault: Parts containing plastic elements - Reaction to heat in a non-radiant dry oven
Renault D45 1601 2004-07	Passenger compartment materials - Volatility of additives on surfaces
PSA D45 1234 1997-08	PSA Peugeot - Citroen: Parts containing plastic elements - Reaction to heat in a non-radiant dry oven
PSA D45 1139 2001-09	PSA Peugeot - Citroen: Covering materials - Dimensional variations and changes in appearance under heat
Jaguar JNS 30.32.04 1989-11	Resistance to heat ageing - General
Fiat 50444 § 1.2 2008-06	Genuine leather, imitation leather and vinyl sheeting: color fastness and aging test - § 1.2 Hot aging
Chrysler LP-463LB-13-01 2001-09	Leather - Physical testing, Heat aging of Trim material
DIN EN ISO 1110 1998-03	Plastics - Polyamides; Accelerated conditioning of test specimens
BMW AA-0420 2010-09	Hydrolysis at Leather
VW PV 3959 2013-10	Hydrolysis test on the roof liner with laminated interior décor
VW PV 5015 BR 2000-10	Test Prescription - Resistance to hydrolysis in PU foams
GMW 14357 2017-03	For cellular and related materials: Determination of Resistance to Humidity ageing
Ford FLTM BI 106-03 2001-03	Hydrolysis resistance of painted plastic panels

### 1.3 Photogrammetry

Determination\_of\_                      Determination of Dimensional Photogrammetry/Tritop  
 Dimensional\_                              Deformation Analysis Shenyang  
 Photogrammetry/  
 Tritop\_Deformation\_  
 Analysis\_SHE  
 2017-03

Type of test	Measurand/ test parameter	Range of performance	smallest attainable measurement uncertainty	Characteristic test processes
optical component measurement	3D dimension (X,Y,Z vectors)	Optical component measurement 0,2 m - 5 m	0,01 mm	Determination of Dimensional Photogrammetry/Tritop Deformation Analysis Shenyang

#### Used abbreviations:

ASTM	American Society for Testing and Materials
BMW AA	BMW work instruction
BMW PR	BMW test procedure
Crysler LP	Crysler Laboratory Procedures
DBL	Daimler Benz delivery instruction
DIN	German Institute for Standardisation
EN	European Standard
FLTM	Ford Laboratory Test Method
GMW	General Motors Worldwide
Hyundai MS	Hyundai Material Specification
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
Porsche PPV	Porsche test procedure
PSA	Peugeot Société Anonyme
Renault RT	Renault Trucks SAS
TPJLR	Test Procedure Jaguar and Land Rover
VDA	Association for automobile industry
VW PV	Volkswagen test procedure
VW TL	Volkswagen technical delivery specification