

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-PL-20258-01-01 according to DIN EN ISO/IEC 17025:2018

Valid from: 24.07.2025

Date of issue: 08.10.2025

This annex is part of the Accreditation Certificate D-PL-20258-01-00.

Holder of the Accreditation Certificate:

**Amphenol-Tuchel Electronics Gesellschaft mit beschränkter Haftung
August-Häusser-Straße 10, 74080 Heilbronn**

with the location

**Amphenol-Tuchel Electronics Gesellschaft mit beschränkter Haftung
Prüflaboratorium
August-Häusser-Straße 10, 74080 Heilbronn**

The testing laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The testing laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories and they conform to the principles of DIN EN ISO 9001.

Tests in the fields:

Electrical, mechanical, and environmental simulation tests involving temperature, humidity, corrosion, IP protection classes, vibration, and mechanical shock, as well as combinations thereof, for the qualification of connectors and other technical products.

*This annex to the certificate was issued by the Deutsche Akkreditierungsstelle GmbH (DAkkS) and is digitally sealed.
This annex to the certificate is only valid together with the written accreditation certificate and reflects the status as indicated by the date of issue. The current status of any valid and surveyed accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH (www.dakks.de).*

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Flexible Scope of Accreditation:

Within the indicated test areas the testing laboratory is permitted without being required to prior inform and obtain approval from DAkkS

[Flex A] to use standardised or equivalent test methods listed here with different issue dates.

[Flex B] to have the free choice from standardised or equivalent test methods.

The test methods listed are examples. The testing laboratory has an up-to-date list of all test methods within the flexible scope of accreditation. The list is publicly available on the website of the testing laboratory.

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Test field [Flex A]			
Testing Field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure	Test Range / Restrictions
Connectors	DIN EN 60512-1-1: 2003-01	Tests and measurements - Part 1-1: General examination - Test 1a: Visual examination	
Connectors	DIN EN 60512-1-2: 2003-01	Tests and measurements - Part 1-2: General examination - Test 1b: Examination of dimension and mass	
Connectors	DIN EN 60512-2-1: 2003-01	Tests and measurements -Part 2-1: Electrical continuity and contact resistance tests - Test 2a: Contact resistance - Millivolt level method	
Connectors	DIN EN 60512-2-2: 2004-01	Tests and measurements - Part 2-2: Electrical continuity and contact resistance tests - Test 2b: Contact resistance – Specified test current method	
Connectors	DIN EN 60512-2-5: 2004-01	Tests and measurements - Part 2-2: Electrical continuity and contact resistance tests - Test 2e: Contact disturbance	
Connectors	DIN EN 60512-2-6: 2003-01	Tests and measurements - Part 2-2: Electrical continuity and contact resistance tests - Test 2f: Housing (shell) electrical continuity	
Connectors	DIN EN 60512-3-1: 2003-01	Tests and measurements - Part 3-1: Insulation tests - Test 3a: Insulation resistance	
Connectors	DIN EN 60512-4-1: 2004-01	Tests and measurements - Part 4-1: Voltage stress tests - Test 4a: Voltage proof	
Connectors	DIN EN 60512-5-1: 2003-01 + Ber 1:2015-06	Tests and measurements - Part 5-1: Current-carrying capacity tests - Test 5a: Temperature rise	
Connectors	DIN EN 60512-5-2: 2003-01	Tests and measurements - Part 5-2: Current-carrying capacity tests - Test 5b: Current-temperature derating	
Connectors	DIN EN 60512-6-3: 2003-01	Tests and measurements - Part 6-3: Dynamic stress tests - Test 6c: Shock	

Test field [Flex A]			
Testing Field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure	Test Range / Restrictions
Connectors	DIN EN 60512-6-4: 2003-01	Tests and measurements - Part 6-4: Dynamic stress tests - Test 6d: Vibration (sinusoidal)	
Connectors	DIN EN 60512-6-5: 2003-01	Basic testing procedures and measuring methods - Part 6: Dynamic stress tests; section 5: Test 6e: Random vibration	
Connectors	DIN EN 60512-7-1: 2010-12	Tests and measurements - Part 7-1: Impact tests (free connectors) – Test 7a: Free fall (repeated)	
Connectors	DIN EN 60512-7-2: 2012-09	Tests and measurements - Part 7-2: Impact tests (free connectors) – Test 7b: Mechanical strength impact	
Connectors	DIN EN 60512-8-1: 2011-07	Tests and measurements - Part 8-1: Static load tests (fixed connectors) – Test 8a: Static load, transverse	
Connectors	DIN EN 60512-8-2: 2012-02	Tests and measurements - Part 8-2: Static load tests (fixed connectors) – Test 8b: Static load, axial	
Connectors	DIN EN 60512-8-3: 2018-10	Tests and measurements - Part 8-3: Static load tests (fixed connectors) – Test 8c: Robustness of actuating lever	
Connectors	DIN EN 60512-9-1: 2010-12	Tests and measurements - Part 9-1: Endurance tests - Test 9a: Mechanical operation	
Connectors	DIN EN 60512-9-2: 2012-09	Tests and measurements - Part 9-2: Endurance tests - Test 9b: Electrical load and temperature	
Connectors	DIN EN 60512-9-5: 2021-02	Tests and measurements - Part 9-5: Endurance tests - Test 9e: Current loading, cyclic	
Connectors	DIN EN 60512-10-4: 2004-06	Tests and measurements - Part 10-4: Impact tests (free components), static load tests and overload tests - endurance tests and overload tests - Test 10d: Electrical overload (connectors)	

Test field [Flex A]			
Testing Field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure	Test Range / Restrictions
Connectors	DIN EN 60512-11-1: 2021-03	Basic testing procedures and measuring methods - Part 11: Climatic tests; Section 1: Test 11a: Climatic sequence	Low pressure tests exempted
Connectors	DIN EN 60512-13-1: 2006-11 + Ber 1:2008-11	Tests and measurements - Part 13-1: Mechanical operation tests - Test 13a: Engaging and separating forces	
Connectors	DIN EN 60512-13-2: 2006-11 + Ber 1:2008-11	Tests and measurements - Part 13-2: Mechanical operation tests - Test 13b: Insertion and withdrawal forces	
Connectors	DIN EN 60512-13-5: 2006-11 + Ber 1:2008-11	Tests and measurements - Part 13-5: Mechanical operation tests - Test 13e: Polarizing and keying method	
Connectors	DIN EN 60512-15-6: 2009-03	Tests and measurements - Part 15-6: Connector tests (mechanical) - Test 15f: Effectiveness of connector coupling devices	
Connectors	DIN EN 60512-16-4: 2009-03	Tests and measurements - Part 16-4: Mechanical tests on contacts and terminations - Test 16d: Tensile strength	
Connectors	DIN EN 61984: 2009-11	Safety requirements and tests	
Connectors	DIN EN 60352-2: 2014-04	Solderless connections - Part 2: Crimped connections - General requirements, test methods and practical guidance	
Schutzarten	DIN EN 60529: 2014-09 + Ber 1:2017-02 + Ber2:2019-06	Degrees of protection provided by enclosures (IP Code)	Only: Protection against access IP 1x to IP 4x Protection against water IP x7 and IPx8
Schutzarten	ISO 20653: 2023-08	Road vehicles - Degrees of protection provided by enclosures (IP Code)	Only: Touch protection IP 1x to IP 4x Water resistance IP x7 and IPx8

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Test field [Flex A]			
Testing Field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure	Test Range / Restrictions
Connectors Climate test	VW 60330: 2013-12	Crimp connections Solderless electrical connections	Without DIN EN 60512-16-8
Connectors Climate test	VW 75174: 2010-04 (LV 214:2010-03)	Automotive connectors Test specification	Without DIN EN 60068-2-13 DIN EN 60512-1-3 DIN EN 60512-1-4 DIN EN 60512-11-14 DIN EN 60512-14-5 DIN 40050-9 E 5.1
Connectors Climate test	VW 75174: 2018-10	Automotive connectors Test specification	Without: DIN EN 60068-2-13 DIN EN 60512-1-3 DIN EN 60512-1-4 DIN EN 60512-11-14 DIN EN 60512-14-5 DIN 40050-9 E 5.1
Connectors Climate test	VW 75174-2: 2008-01 (LV 214-2:2007-10)	Automotive contacts, slow-motion tests	
Connectors Climate test	VW 75174-2: 2020-02	Automotive contacts, slow-motion tests	
Connectors Climate test	VW 80302: 2013-03 (LV 215-2:2013-02)	High-voltage automotive contacts, test standard	Without: DIN EN 60068-2-13 DIN EN 60512-1-3 DIN EN 60512-1-4 DIN EN 60512-11-14 DIN EN 60512-14-5 DIN 40050-9 VG 95214-11 DIN EN 60664-1

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Test field [Flex A]			
Testing Field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure	Test Range / Restrictions
Connectors Climate test	VW 80304: 2013-02 (LV 215-1:2013-02)	High-voltage automotive contacts, specifications	
Connectors Climate test	VW 80332: 2021-02	High-voltage automotive contacts	Without: DIN EN 60068-2-13 DIN EN 60512-1-3 DIN EN 60512-1-4 DIN EN 60512-11- 14 DIN EN 60512-14-5 ISO 20653 IP5xk, IP6xk, IPx1k - to IPx6k, IPx9k VG 952114-11 DIN EN 50289-1-11 DIN EN 60664-1
Connectors / Components Climate test	VW 80000: 2013-06 (LV 124:2013-02)	Electric and electronic components in vehicles up to 3.5t - general requirements, test conditions and tests	Without: E-01, E-02, E-03, E- 04, E-05, E-06, E- 07, E-08, E-09, E- 10, E-11, E-12, E- 13, E-14, E-15, E- 16, E-17, E-19, E- 21, E-22, M-02, M- 03, K-05 Prüfverfahren Nc, K-10, K-11, K- 12, K-15, K-17, K- 18

Test field [Flex A]			
Testing Field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure	Test Range / Restrictions
Connectors / Components Climate test	VW 80000: 2021-01	Electric and electronic components in vehicles up to 3.5t - general requirements, test conditions and tests	Ausgenommene sind: P-04, E-01, E-02, E-03, E-04, E-05, E-06, E-07, E-08, E-09, E-10, E-11, E-12, E-13, E-14, E-15, E-16, E-17, E-19, E-21, E-22, M-02, M-03, M-07 M-09, K-05 testing method Nc, K-10, K-11, K-12, K-15, K-17, K-18
Connectors Climate test	USCAR 2 Rev 7 2020-02	Performance Specification for Automotive Electrical Connector Systems	Without: 5.4.13, 5.6.7
Connectors Climate test	USCAR 21 Rev 4 2020-01	Performance Specification for Cable to Terminal electrical Crimps	
Environment	DIN EN 60068-2-1: 2008-01	Environmental testing - Part 2-1: Tests - Test A: Cold	
Environment	DIN EN 60068-2-2: 2008-05	Environmental testing - Part 2-1: Tests - Test A: Cold	
Environment	DIN EN 60068-2-6: 2008-10	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	
Environment	DIN EN 60068-2-11: 2020-09	Environmental testing - Part 2: Tests; test Ka: Salt mist	
Environment	DIN EN 60068-2-14: 2025-03	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	
Environment	DIN EN 60068-2-27: 2010-02	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	
Environment	DIN EN 60068-2-30: 2006-06	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic	
Environment	DIN EN 60068-2-31: 2009-04	Environmental testing - Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens	

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Test field [Flex A]			
Testing Field	Standard / In-House Procedure / Version	Title of Standard or In-House Procedure	Test Range / Restrictions
Environment	DIN EN 60068-2-38: 2022-09	Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature / humidity cyclic test	
Environment	DIN EN 60068-2-52: 2018-08 + Ber1:2019-02	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic	Without test method 7 and 8
Environment	DIN EN 60068-2-61: 1993-12	Environmental testing; part 2: test methods; test Z/ABDM: climatic sequence	Low pressure tests exempted
Environment	DIN EN 60068-2-64: 2020-09	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance	
Environment	DIN EN 60068-2-67: 2020-08	Environmental testing - Part 2-67: Tests - Test Cy: Damp heat, steady state, accelerated test primarily intended for components	
Environment	DIN EN 60068-2-78: 2014-02	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	
Environment	DIN EN 60068-2-80: 2006-05	Environmental testing - Part 2-80: Tests - Test Fi: Vibration - Mixed mode	
Corrosion	DIN EN ISO 9227: 2024-10	Corrosion tests in artificial atmospheres - Salt spray tests	NSS only
Corrosion	ASTM B 117:2019	Standard Practice for Operating Salt Spray (Fog) Apparatus	NSS only
Corrosion	DIN EN ISO 6270-2: 2018-04	Paints and varnishes - Determination of resistance to humidity - Part 2: Condensation	

Test field [Flex B]			
Type of test / test parameters	Test range	Limit deviation	Typical test procedures
Dry Heat / Cold	-70 °C to + 180 °C	±2 K	DIN EN 60068-2-1 DIN EN 60068-2-2
Change of temperature	-70 °C to +180 °C	±2 K	DIN EN 60068-2-14 Nb

Test field [Flex B]			
Type of test / test parameters	Test range	Limit deviation	Typical test procedures
Temperature shock	-70 °C to +180 °C	±2 K	DIN EN 60068-2-14 Na
Temperature	-70 °C to +180 °C	-	DIN EN 60068-2-1 DIN EN 60068-2-2-
Constant humidity	10 % to 100 % r.F.	±3 % r.F.	DIN EN 60068-2-78 DIN EN ISO 6270-2 CHT
Change of climate	10 % to 100 % r.F.	±3 % r.F.	DIN EN 60068-2-38 DIN EN ISO 6270-2 AT / AHT
Relative humidity	95 % r.F.		DIN EN 60068-2-78
IPX7 / IPX8 Immersion test	at RT up to 25 m		DIN EN 60529 ISO 20653
Pressure	up to 4 bar		DIN EN 60529
IP1X to IP4X Object / access probe		Test force: ±10 %	DIN EN 60529 ISO 20653
Sine excitation / Frequency range	5 Hz to 2.000 Hz	Frequency: ±1 Hz from 5 Hz to 50 Hz ±2 % over 50 Hz Acceleration reference point: ±15 %	DIN EN 60068-2-6
Noise excitation frequency	5 Hz to 2.000 Hz	±10 % g _{RMS}	DIN EN 60068-2-64
Shock excitation	Acceleration: 5 g bis 50 g shock duration: 2 ms bis 30 ms	±15 % m/s	DIN EN 60068-2-27
Excitation with temperature superposition	-50 °C to +150 °C	±2 K	DIN EN 60068-2-14 Nb DIN EN 60068-2-64
Frequency	2 Hz to 5.000 Hz		DIN EN 60068-2-64
Acceleration	0,1 m/s ² to 1.000 m/s ²		DIN EN 60068-2-64
Salt spray	RT (UT + 5 K) to 50 °C	±2 K	DIN EN ISO 9227 DIN EN 60068-2-11 DIN EN 60068-2-52

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Test field [Flex B]			
Type of test / test parameters	Test range	Limit deviation	Typical test procedures
Condensed water, CH, AHT, AT	RT (UT + 5 K) to 42 °C	±3 K	DIN EN ISO 6270-2
DC voltage measurement	1 mV to 100V		VW 751742018-10 USCAR 2 Rev7
DC Voltage proof test	0,1 kV to 6 kV	±(2%+50V)	DIN EN 60512-4-1
AC test 50Hz Voltage proof	0,1 kV to 5 kV	±(2%+50V)	DIN EN 60512-4-1
DC measurement Current	0,1 mA to 2.000 A		DIN EN 60512-5-2 DIN EN 60512-2-2
Electrical resistance	0,05 mΩ to 10 MΩ		DIN EN 60512-2-1
Insulation resistance measurement at 100 V / 250 V / 500 V / 1000 V	10 MΩ to 10 GΩ		DIN EN 60512-3-1
Visual inspection	Magnification: 8x to 1,000x stereo		DIN EN 60512-1-1
Contact interruption	1 μs 10 μs	Span of time: ±10 %	DIN EN 60512-2-5
Current heating Temperature rise	Current: 1 A bis 2.000 A Temperature: 20 °C bis 250 °C	Current: ±1 %	DIN EN 60512-5-1 DIN EN 60512-5-2 DIN EN 60512-10-4
Pressure and tensile force	1 N to 100 kN		DIN EN 60512-13-1 DIN EN 60512-13-2

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Abbreviations used:

ASTM	American Society for Testing and Materials
DIN	Deutsches Institut für Normung e.V. - German institute for standardization
EN	Europäische Norm - European Standard
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LV	Liefervorschrift - Delivery specification
USCAR	United States Council for Automotive Research
VW	Volkswagen