1. Purpose and objective

This document shall give an overview of the test methods for which the MD ELEKTRONIK GmbH Test Laboratory is accredited. The revision statuses specified in this document comply with those in the DAkkS certificate appendix or with a subsequent version that is within the framework of the flexible accreditation.
In addition to this document, the certificate of the German national accreditation body (Deutsche Akkreditierungsstelle GmbH) also applies with the tests regarding the fields specified on the certificate.

2. Range of application

- Locations: MD(D), MD(CZ)
- Division: Test Laboratory

3. List of test methods

The following list contains all test methods including the publication date. The test methods marked with “X” can be performed at the respective location.

3.1 Test range: physically-chemical tests of plastics

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
Plastics testing	**DIN EN ISO 11357-1: 2016-05**	Plastics - Differential scanning calorimetry (DSC) - Part 1: General principles		X	
	DIN EN ISO 11357-1: 2017-02	Plastics - Differential scanning calorimetry (DSC) - Part 1: General principles	Differential scanning calorimetry with performance compensation is not available.	X	
	DIN EN ISO 11357-2: 2014-07	Plastics - Differential scanning calorimetry (DSC) - Part 2: Determination of glass transition temperature and glass transition step height		X	
	DIN EN ISO 11357-2: 2019-03	Plastics - Differential scanning calorimetry (DSC) - Part 2: Determination of glass transition temperature and glass transition step height		X	
	DIN EN ISO 11357-2: 2020-08	Plastics - Differential scanning calorimetry (DSC) - Part 2: Determination of glass transition temperature and step height		X	
	DIN EN ISO 11357-3: 2017-05	Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization		X	
	DIN EN ISO 11357-3: 2018-07	Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization		X	

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
	DIN EN ISO 11358-1: 2014-10	Plastics - Thermogravimetry (TG) of polymers - Part 1: General principles		X	
	DIN EN ISO 11358-1: 2020-12	Plastics - Thermogravimetry (TG) of polymers - Part 1: General principles		X	
	DIN EN ISO 1183-1: 2019-09	Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method	Limitation to: method A	X	
	DIN ISO 48-2: 2021-02	Rubber, vulcanized or thermoplastic - Determination of hardness - Part 2: Hardness between 10 IRHD and 100 IRHD	Limitation to: method M	X	

3.2 Test range: electrical engineering / EMC

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
Electrical engineering	**DIN EN 50289-1-2: 2002-02**	Communication cables - Specifications for test methods - Part 1-2: Electrical test methods; DC resistance		X	X
	DIN EN 50289-1-3: 2002-02	Communication cables - Specifications for test methods - Part 1-3: Electrical test methods; Dielectric strength		X	X
	DIN EN 50289-1-4: 2002-02	Communication cables - Specifications for test methods - Part 1-4: Electrical test methods; Insulation resistance		X	X
	DIN EN 50289-1-5: 2002-02	Communication cables - Specifications for test methods - Part 1-5: Electrical test methods; Capacitance		X	X
EMC	**DIN EN 50289-1-6: 2002-12**	Communication cables - Specifications for test methods - Part 1-6: Electrical test methods; Electromagnetic performance	Limitation to: 6.: surface transfer impedance, triaxial method 8.: screening attenuation, triaxial method	X	X
Electrical engineering	**DIN EN 50289-1-7: 2002-02**	Communication cables - Specifications for test methods - Part 1-7: Electrical test methods; Velocity of propagation		X	X
	DIN EN 50289-1-8, VDE 0819-289-1-8: 2016-11	Communication cables - Specifications for test methods - Part 1-8: Electrical test methods - Attenuation		X	
	DIN EN 50289-1-8, VDE 0819-289-1-8: 2018-02	Communication cables - Specifications for test methods - Part 1-8: Electrical test methods - Attenuation		X	X

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
	DIN EN 50289-1-9, VDE 0819-289-1-9: 2016-11	Communication cables - Specifications for test methods - Part 1-9: Electrical test methods - Unbalance attenuation (transverse conversion loss TCL transverse conversion transfer loss TCTL)		X	
	DIN EN 50289-1-9, VDE 0819-289-1-9: 2018-01	Communication cables - Specifications for test methods - Part 1-9: Electrical test methods - Unbalance attenuation (transverse conversion loss TCL transverse conversion transfer loss TCTL)		X	X
	DIN EN 50289-1-10: 2002-07	Communication cables - Specifications for test methods - Part 1-10: Electrical test methods; Crosstalk	Is performed without balun measuring technique	X	X
	DIN EN 50289-1-11, VDE 0819-289-1-11: 2017-08	Communication cables - Specifications for test methods - Part 1-11: Electrical test methods - Characteristic impedance, input impedance, return loss		X	
	DIN EN 50289-1-11, VDE 0819-289-1-11: 2018-08	Communication cables - Specifications for test methods - Part 1-11: Electrical test methods - Characteristic impedance, input impedance, return loss		X	X
	DIN EN 50289-1-12: 2005-10	Communication cables - Specifications for test methods - Part 1-12: Electrical test methods - Inductance		X	X
	DIN EN 60512-25-1: 2002-08	Connectors for electronic equipment - Tests and measurements - Part 25-1: Test 25a: Crosstalk ratio		X	X
	DIN EN 60512-25-2: 2002-12	Connectors for electronic equipment - Tests and measurements - Part 25-2: Test 25b: Attenuation (insertion loss)		X	X
	DIN EN 60512-25-3: 2002-08	Connectors for electronic equipment - Tests and measurements - Part 25-3: Test 25c: Rise time degradation		X	X
	DIN EN 60512-25-4: 2002-08	Connectors for electronic equipment - Tests and measurements - Part 25-4: Test 25d: Propagation delay		X	X
	DIN EN 60512-25-5: 2005-05	Connectors for electronic equipment - Tests and measurements - Part 25-5: Test 25e - Return loss		X	X
	DIN EN 60512-25-7: 2005-12	Connectors for electronic equipment - Tests and measurements - Part 25-7: Test 25g - Impedance, reflection coefficient and standing voltage wave ratio (VSWR)		X	X
	DIN EN 60512-1-1: 2003-01	Connectors for electronic equipment - Tests and measurements - Part 1-1: General examination; Test 1a: Visual examination		X	X

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
	DIN EN 13018: 2015-08	Non-destructive testing - Visual testing - General principles		X	
	DIN EN 13018: 2016-06	Non-destructive testing - Visual testing - General principles		X	X
	DIN EN 60512-2-1: 2003-01	Connectors for electronic equipment - Tests and measurements - Part 2-1: Electrical continuity and contact resistance tests; Test 2a: Contact resistance; Millivolt level method		X	X
	DIN EN 60512-2-2: 2004-01	Connectors for electronic equipment - Tests and measurements - Part 2-2: Electrical continuity and contact resistance tests - Test 2b: Contact resistance - Specified test current method		X	X
	DIN EN 60512-2-5 2e: 2004-01	Connectors for electronic equipment - Tests and measurements - Part 2-5: Electrical continuity and contact resistance tests - Test 2e: Contact disturbance		X	X
	DIN EN 60512-3-1: 2003-01	Connectors for electronic equipment - Tests and measurements - Part 3-1: Insulation tests; Test 3a: Insulation resistance		X	X
	DIN EN 60512-4-1: 2004-01	Connectors for electronic equipment - Tests and measurements - Part 4-1: Voltage stress tests - Test 4a: Voltage proof		X	X
	DIN EN 60512-5-1: 2003-01 With corrigendum: 2015-06	Connectors for electronic equipment - Tests and measurements - Part 5-1: Current-carrying capacity tests; Test 5a: Temperature rise		X	
	DIN EN 60512-5-2: 2003-01	Connectors for electronic equipment - Tests and measurements - Part 5-2: Current-carrying capacity tests; Test 5b: Current-temperature derating		X	
	DIN EN 60512-13-5: 2006-11 With corrigendum: 2008-11	Connectors for electronic equipment - Tests and measurements - Part 13-5: Mechanical operation tests - Test 13e: Polarizing and keying method		X	X
EMC	**DIN EN 62153-4-3: 2011-10**	Metallic communication cable test methods - Part 4-3: Electromagnetic Compatibility (EMC) - Surface transfer impedance - Triaxial method	Limitation to: method C	X	
	DIN EN 62153-4-3: 2011-10 (Withdrawn)	Metallic communication cable test methods - Part 4-3: Electromagnetic Compatibility (EMC) - Surface transfer impedance - Triaxial method		X	X
	IEC 62153-4-3: 2013-10	Metallic communication cable test methods - Part 4-3: Electromagnetic Compatibility (EMC) - Surface transfer impedance - Triaxial method		X	X

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
	DIN EN 62153-4-4, VDE 0819-153-4-4: 2012-07 (Withdrawn)	Metallic communication cable test methods - Part 4-4: Electromagnetic compatibility (EMC) - Shielded screening attenuation, test method for measuring of the screening attenuation as up to and above 3 GHz		X	X
	IEC 62153-4-4: 2015-04	Metallic communication cable test methods - Part 4-4: Electro Magnetic Compatibility (EMC) - Test method for measuring of the screening attenuation as up to and above 3 GHz, triaxial method		X	X
	DIN EN 62153-4-7, VDE 0819-153-4-7: 2016-12	Metallic communication cable test methods - Part 4-7: Electromagnetic compatibility (EMC) - Test method for measuring of transfer impedance ZT and screening attenuation as or coupling attenuation ac of connectors and assemblies up to and above 3 GHz - Triaxial tube in tube method		X	
	DIN EN 62153-4-7, VDE 0819-153-4-7: 2017-09	Metallic communication cable test methods - Part 4-7: Electromagnetic compatibility (EMC) - Test method for measuring of transfer impedance ZT and screening attenuation as or coupling attenuation ac of connectors and assemblies up to and above 3 GHz - Triaxial tube in tube method		X	
	DIN EN 62153-4-7, VDE 0819-153-4-7: 2018-12	Metallic communication cable test methods - Part 4-7: Electromagnetic compatibility (EMC) - Test method for measuring of transfer impedance ZT and screening attenuation as or coupling attenuation ac of connectors and assemblies up to and above 3 GHz - Triaxial tube in tube method		X	X
	IEC 62153-4-7: 2015-12 (Withdrawn)	Metallic communication cable test methods - Part 4-7: Electromagnetic compatibility (EMC) - Test method for measuring of transfer impedance ZT and screening attenuation as or coupling attenuation aC of connectors and assemblies up to and above 3 GHz - Triaxial tube in tube method		X	X
	IEC 62153-4-7: 2021-07	Metallic cables and other passive components test methods - Part 4-7: Electromagnetic compatibility (EMC) - Test method for measuring of transfer impedance ZT and screening attenuation aS or coupling attenuation aC of connectors and assemblies - Triaxial tube in tube method		X	X

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
	DIN EN 62153-4-9, VDE 0819-153-4-9: 2016-12 (Withdrawn)	Metallic Communication Cable test methods - Part 4-9: Electromagnetic compatibility (EMC) - Coupling attenuation of screened balanced cables, triaxial method		X	X
	IEC 62153-4-9: 2018-05	Metallic communication cable test methods - Part 4-9: Electromagnetic compatibility (EMC) - Coupling attenuation of screened balanced cables, triaxial method		X	X
Electrical engineering	**DIN 72594-2: 2009-05**	Road vehicles - 50 ohm radio frequency interface (50 Ω RFI) - Part 2: Test procedures	In case of chapter 6.6, the currently valid standard is used. Limitations (CZ): test group 4 mechan. shock/vibration is impossible	X	X
	ISO 6722-1: 2011-10	Road vehicles – 60 V and 600 V single-core cables – Part 1: Dimensions, test methods and requirements for copper conductor cables	Limitations: resistance to flame propagation; resistance to ozone	X	
	ISO 14572: 2011-10	Road vehicles – Round, sheathed, 60 V and 600 V screened and unscreened single- or multi-core cables – Test methods and requirements for basic- and high-performance cables	Limitations: resistance to flame propagation; artificial weathering; resistance to ozone	X	
	ISO 19642-2: 2019-01	Road vehicles – Automotive cables – Part 2: Test methods	Limitations: resistance to flame propagation; resistance to ozone; artificial weathering	X	
	ISO 19642-3: 2019-01	Road vehicles – Automotive cables – Part 3: Dimensions and requirements for 30 V a.c. or 60 V d.c. single core copper conductor cables	Limitations: resistance to flame propagation; resistance to ozone	X	
	ISO 20860-1: 2008-10	Road vehicles - 50 ohms impedance radio frequency connection system interface - Part 1: Dimensions and electrical requirements		X	X
	ISO 20860-2: 2009-03	Road vehicles - 50 ohms impedance radio frequency connection system interface - Part 2: Test procedures	In case of chapter 7.7, the currently valid standard is used. Limitations (CZ): test sequence 4 mech. shock/vibration is impossible	X	X

3.3 Test range: environmental simulation

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
Environmental simulation	**DIN EN 60068-2-1, VDE 0468-2-1: 2008-01**	Environmental testing - Part 2-1: Tests - Test A: Cold	Limitations: air velocity in the working space cannot be changed	X	X
	DIN EN 60068-2-2, VDE 0468-2-2: 2008-05	Environmental testing - Part 2-2: Tests - Test B: Dry heat	Limitations: air velocity in the working space cannot be changed	X	X
	DIN EN 60068-2-6, VDE 0468-2-6: 2008-10	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)		X	
	DIN EN 60068-2-11 Ka: 2000-02	Environmental testing - Part 2: Tests; test Ka: Salt mist		X	
	DIN EN 60068-2-14, VDE 0468-2-14: 2010-04	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	Limitations: method Nc is impossible	X	X
	DIN EN 60068-2-14 Na: 2010-04	Environmental testing - Part 2: Tests - Test N: Na: Temperature shock (without housing)		X	X
	DIN EN 60068-2-14: Nb: 2010-04	Environmental testing - Part 2: Tests - Test N: Nb: Change of temperature		X	X
	DIN EN 60068-2-27, VDE 0468-2-27: 2010-02	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock		X	
	DIN EN 60068-2-30: 2006-06	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)		X	X
	DIN EN 60068-2-38, VDE 0468-2-38: 2010-06	Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test		X	X
	DIN EN 60068-2-52: 1996-10	Environmental testing - Part 2: Tests, Test Kb: Salt mist, cyclic (sodium chloride solution)		X	
	DIN EN 60068-2-52, VDE 0468-2-52: 2017-03	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)		X	
	DIN EN IEC 60068-2-52, VDE 0468-2-52: 2018-08	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	Limitation to: test methods 1 - 6	X	
	DIN EN IEC 60068-2-52, VDE 0468-2-52: 2018-08 With corrigendum: 2019-02	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	Limitation to: test methods 1 - 6	X	
	DIN EN 60068-2-53, VDE 0468-2-53: 2011-02	Environmental testing - Part 2-53: Tests and guidance: Combined climatic (temperature/humidity) and dynamic (vibration/shock) tests		X	
	DIN EN 60068-2-60: 1996-09	Environmental testing - Part 2: Tests - Test Ke: Flowing mixed gas corrosion test	Limitation to: 6.3 method 4	X	
	DIN EN 60068-2-60, VDE 0468-2-60: 2014-09	Environmental testing - Part 2-60: Tests - Test Ke: Flowing mixed gas corrosion test	Limitation to: 6.3 method 4	X	

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
	DIN EN 60068-2-60, VDE 0468-2-60: 2016-06	Environmental testing - Part 2-60: Tests - Test Ke: Flowing mixed gas corrosion test	Limitation to: 6.3 method 4	X	
	DIN EN 60068-2-64, VDE 0468-2-64: 2017-05	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance		X	
	DIN EN 60068-2-64, VDE 0468-2-64: 2020-09	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance		X	
	DIN EN 60068-2-67: 1996-07	Environmental testing - Part 2: Tests; test Cy: Damp heat, steady state, accelerated test primarily intended for components		X	
	DIN EN 60068-2-67, VDE 0468-2-67: 2017-08	Environmental testing - Part 2: Tests; test Cy: Damp heat, steady state, accelerated test primarily intended for components		X	
	DIN EN 60068-2-67, VDE 0468-2-67: 2020-08	Environmental testing - Part 2-67: Tests - Test Cy: Damp heat, steady state, accelerated test primarily intended for components		X	X
	DIN EN 60068-2-78, VDE 0468-2-78: 2010-10	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state		X	
	DIN EN 60068-2-78, VDE 0468-2-78: 2014-02	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state		X	X
	DIN EN 60068-2-80: 2006-05	Environmental testing - Part 2-80: Tests - Test Fi: Vibration - Mixed mode		X	
	DIN EN 60512-11-14: 2004-06	Connectors for electronic equipment - Tests and measurements - Part 11-14: Climatic tests - Test 11p: Flowing single gas corrosion test		X	
	DIN EN 60512-14-5: 2006-11	Connectors for electronic equipment - Tests and measurements - Part 14-5: Sealing tests - Test 14e: Immersion at low air pressure		X	X
	DIN 75220: 1992-11	Ageing of automotive components in solar simulation units		X	
	ISO 20653: 2013-02	Road vehicles - Degrees of protection (IP code) - Protection of electrical equipment against foreign objects, water and access – Cleaning process with high pressure / steam jet cleaning	Limitation to IPX9K	X	

3.4 Test range: mechanical tests

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
Mechanical tests	**DIN EN 50289-3-17: 2002-09**	Communication cables - Specifications for test methods - Part 3-17: Mechanical test methods; Adhesion of dielectric and sheath		X	

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
	DIN EN 50525-2-21, VDE 0285-525-2-21: 2012-01	Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) - Part 2-21: Cables for general applications - Flexible cables with crosslinked elastomeric insulation		X	
	DIN EN 50396, VDE 0473-396: 2006-07 With update 2012-03	Non electrical test methods for low voltage energy cables		X	
	DIN EN 60068-2-31, VDE 0468-2-31: 2009-04	Environmental testing - Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens		X	X
	DIN EN 60512-1-2: 2003-01	Connectors for electronic equipment - Tests and measurements - Part 1-2: General examination; Test 1b: Examination of dimension and mass		X	X
	DIN EN 60512-7-1, VDE 0687-512-7-1: 2010-12	Connectors for electronic equipment - Tests and measurements - Part 7-1: Impact tests (free connectors) - Test 7a: Free fall (repeated)		X	X
	DIN EN 60512-13-1: 2006-11 With corrigendum: 2008-11	Connectors for electronic equipment - Tests and measurements - Part 13-1: Mechanical operation tests - Test 13a: Engaging and separating forces		X	X
	DIN EN 60512-13-2: 2006-11 With corrigendum: 2008-11	Connectors for electronic equipment - Tests and measurements - Part 13-2: Mechanical operation tests - Test 13b: Insertion and withdrawal forces		X	X
	DIN EN 60512-15-6: 2009-03	Connectors for electronic equipment - Tests and measurements - Part 15-6: Connector tests (mechanical) - Test 15f: Effectiveness of connector coupling devices		X	X
	DIN EN 60512-16-4: 2009-03	Connectors for electronic equipment - Tests and measurements - Part 16-4: Mechanical tests on contacts and terminations - Test 16d: Tensile strength (crimped connections)		X	X
	DIN EN 60811-201, VDE 0473-811-201: 2018-05	Electric and optical fibre cables - Test methods for non-metallic materials - Part 201: General tests - Measurement of insulation thickness		X	
	DIN EN 60811-202, VDE 0473-811-202: 2018-05	Electric and optical fibre cables - Test methods for non-metallic materials - Part 202: General tests - Measurement of thickness of non-metallic sheath		X	

Special field	Standard or test method / publication date	Title of the standard or test method	Limitations regarding the test method	Location	
				MD D	MD CZ
	DIN EN 60811-203, VDE 0473-811-203: 2012-12	Electric and optical fibre cables - Test methods for non-metallic materials - Part 203: General tests - Measurement of overall dimensions		X	
	DIN EN 60811-501, VDE 0473-811-501: 2019-04	Electric and optical fibre cables - Test methods for non-metallic materials - Part 501: Mechanical tests - Tests for determining the mechanical properties of insulating and sheathing compounds		X	
	DIN EN 60811-502, VDE 0473-811-502: 2012-12	Electric and optical fibre cables - Test methods for non-metallic materials - Part 502: Mechanical tests - Shrinkage test for insulations		X	
	DIN EN 60811-507, VDE 0473-811-507: 2012-12	Electric and optical fibre cables - Test methods for non-metallic materials - Part 507: Mechanical tests - Hot set test for cross-linked materials		X	
	DIN EN 60811-508, VDE 0473-811-508: 2018-05	Electric and optical fibre cables - Test methods for non-metallic materials - Part 508: Mechanical tests - Pressure test at high temperature for insulation and sheaths		X	
	DIN EN 50289-3-9: 2002-05	Communication cables - Specifications for test methods - Part 3-9: Mechanical test methods; Bending tests	Limitation to: section 4.3 method 1 and chapter 5	X	

Used abbreviations:

DIN	German Institute for Standardization
EMC	electromagnetic compatibility
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
VDE	Association for Electrical, Electronic & Information Technologies

4. Chronology of modifications:

Revision status	Originator	Date	Type of modification
10042973	Sicorschi	11/19/2014	Document created
10099362	Sicorschi	3/8/2017	Update
10115664	Sicorschi	3/19/2018	Update
10156157	Sicorschi	4/8/2019	Update
10158950	Sicorschi	5/20/2019	Update
10215852	Sicorschi	4/26/2021	Update of publication date
10216751	Sicorschi U. / Krauter M.	11/15/2021	Complete update - Chapters 2 and 3 updated - Standard/test method/publication date revised - Location MD(CZ) added - English language version added

Release and control:

	Name *(in block letters)*	Signature	Date
Checked by specialist department/division:	Dr. Haas A.		
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