

## Deutsche Akkreditierungsstelle GmbH

**Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV**

Signatory to the Multilateral Agreements of  
EA, ILAC and IAF for Mutual Recognition

# Accreditation



The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

**Industrieanlagen-Betriebsgesellschaft mbH (IABG)  
Betriebsfestigkeitslabor (IBL)  
Einsteinstraße 20, 85521 Ottobrunn**

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

**mechanical testing of metallic and polymer materials; metallographic testing of metallic materials; paints and varnishes - selected tests on coating materials; cyclic testing of metallic materials specimen and components; fracture mechanics testing; vibration testing and earthquake simulation; climatical tests of components**

The accreditation certificate shall only apply in connection with the notice of accreditation of 18.12.2017 with the accreditation number D-PL-12001-02 and is valid until 17.12.2022. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 14 pages.

Registration number of the certificate: **D-PL-12001-02-00**

Berlin,  
18.12.2017

Dipl.-Ing. (FH) Ralf Egner  
Head of Division

Translation issued:  
08.01.2018

  
Head of Division

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

# Deutsche Akkreditierungsstelle GmbH

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The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkKS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkKS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:

EA: [www.european-accreditation.org](http://www.european-accreditation.org)

ILAC: [www.ilac.org](http://www.ilac.org)

IAF: [www.iaf.nu](http://www.iaf.nu)

## Deutsche Akkreditierungsstelle GmbH

### Annex to the Accreditation Certificate D-PL-12001-02-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 18.12.2017 to 17.12.2022

Date of issue: 08.01.2018

Holder of certificate:

**Industrieanlagen-Betriebsgesellschaft mbH (IABG)  
Betriebsfestigkeitslabor (IBL)  
Einsteinstraße 20, 85521 Ottobrunn**

Tests in the fields:

**mechanical testing of metallic and polymer materials; metallographic testing of metallic materials; paints and varnishes - selected tests on coating materials; cyclic testing of metallic materials specimen and components; fracture mechanics testing; vibration testing and earthquake simulation; climatical tests of components**

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.**

**Materials Laboratory (IBL-M)**

**1 Hardness tests \***

DIN EN ISO 6506-1 2015-02	Metallic materials - Brinell hardness test - Part 1: Test method
ASTM E 10 2017	Standard Test Method for Brinell Hardness of Metallic Materials
DIN EN ISO 6507-1 2006-03	Metallic materials - Vickers hardness test - Part 1: Test method
ASTM E 384 2016	Standard Test Method for Microindentation Hardness of Materials
DIN EN ISO 6508-1 2016-12	Metallic materials - Rockwell hardness test - Part 1: Test method (here: <i>C scale</i> )
ASTM E 18 2017	Standard Test Methods for Rockwell Hardness of Metallic Materials
DIN EN ISO 2639 2003-04	Steels - Determination and verification of the depth of carburized and hardened cases
DIN EN ISO 3887 2003-10	Steels - Determination of depth of decarburization
DIN EN 10328 2005-04	Iron and steel - Determination of the conventional depth of hardening after surface heating
DIN EN ISO 9015-1 2011-05	Destructive tests on welds in metallic materials - Hardness testing - Part 1: Hardness test on arc welded joints
DIN EN ISO 9015-2 2016-10	Destructive tests on welds in metallic materials - Hardness testing - Part 2: Microhardness testing of welded joints
DIN 50190-3 1979-03	Hardness depth of heat-treated parts; determination of the effective depth of hardening after nitriding
DIN 50190-4 1999-09	Hardness depth of heat-treated parts - Part 4: Determination of the fusion hardening depth and the fusion depth

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DIN ISO 48 2016-09	Rubber, vulcanized or thermoplastic - Determination of hardness (hardness between 10 IRHD and 100 IRHD)
DIN ISO 7619-1 2012-02	Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 1: Durometer method (Shore hardness)
DIN EN ISO 868 2003-10	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)

**2 Metallographic tests \***

DIN EN ISO 643 2013-05	Steels - Micrographic determination of the apparent grain size
DIN EN 10247 2017-09	Micrographic examination of the non-metallic inclusion content of steels using standard pictures
DIN EN ISO 3887 2003-10	Steels - Determination of depth of decarburization
ASTM E 45 2013	Standard Test Methods for Determining the Inclusion Content of Steel
ASTM E 112 2013	Standard Test Methods for Determining Average Grain Size
DIN EN ISO 945-1 2010-09	Microstructure of cast irons - Part 1: Graphite classification by visual analysis
DIN EN ISO 1463 2004-08	Metallic and oxide coatings - Measurement of coating thickness - Microscopical method
SEP 1520 1998-09	Microscopic examination of carbide structure in steels by means of diagram series
SEP 1572 1971-08	Microscopic test of free cutting steels for solid nonmetallic inclusions in metal by means of strip mosaics
SEP 1615 1975-01	Microscopic and macroscopic testing of high-speed steels for their carbide distribution by means of strip mosaics

### 3 Paints and varnishes \*

DIN EN ISO 2409 2013-06	Paints and varnishes - Cross-cut test
ASTM D 3359 2017	Standard Test Methods for Rating Adhesion by Tape Test
DIN EN ISO 4628-2 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 2: Assessment of degree of blistering
DIN EN ISO 4628-3 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 3: Assessment of degree of rusting
ASTM D 714 2002	Standard Test Method for Evaluating Degree of Blistering of Paints
ASTM D 610 2008	Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces

### 4 Component metallography \*

DIN 54150 1977-08	Non-destructive testing; impression methods for surface examination (Replica-technique) <i>(withdrawn document)</i>
ISO 3057 1998-03	Non-destructive testing - Metallographic replica techniques of surface examination

The tests in the fields of the flexible accreditation are characterized by the test statistics mentioned in the following tables.

Method		Test	Exemplary standard
1	Hardness tests on polymer and metallic materials	Vickers Brinell Rockwell HRC IRHD Shore A and D	DIN EN ISO 6507-1 ASTM E384 DIN EN 9015-1 DIN EN 9015-2 DIN EN ISO 2639 DIN EN 10328 DIN 50190-3 DIN 50190-4 DIN EN ISO 3887 DIN EN ISO 6506-1 ASTM E10 DIN EN ISO 6508-1 ASTM E18 DIN ISO 48 DIN ISO 7619-1 DIN EN ISO 868
2	Metallographic tests	Light microscopy	DIN ISO 643 DIN EN ISO 3887 DIN EN ISO 945 DIN EN 10247 ASTM E45 ASTM E112 SEP 1520 SEP 1572 SEP 1615 DIN EN ISO 1463
3	Paints and varnishes	Cross cut test Test on coating material	DIN EN ISO 2409 ASTM D3359 DIN EN ISO 4628-2 ASTM D714 DIN EN ISO 4628-3 ASTM D 610
4	Ambulance metallographic services	Replica-technique	DIN 54150 ISO 3057

**Laboratory for Specimen Testing (IBL-P), Laboratory for Component Testing (IBL-B) and  
Laboratory for Environmental Simulation (IBL-U)**

**1 Mechanical and technological tests \***

DIN EN ISO 6892-1 2017-02	Metallic materials - Tensile testing - Part 1: Method of test at room temperature (here: <i>Method B</i> )
DIN EN ISO 6892-2 2011-05	Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature
DIN EN ISO 6892-3 2015-07	Metallic materials - Tensile testing - Part 3: Method of test at low temperature
ASTM D 3518 2013	Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a $\pm 45^\circ$ Laminate
ASTM D 3039 2014	Standard test method for tensile properties of polymer matrix composite materials

**2 Fatigue tests \***

DIN 50100 2016-12	Load controlled fatigue testing - Execution and evaluation of cyclic tests at constant load amplitudes on metallic specimens and components
ASTM E 466 2015	Standard Practice for Conducting Force Controlled Constant Amplitude Axial Fatigue Tests of Metallic Materials

**3 Fracture mechanic tests \***

ISO 12108 2012-08	Metallic materials - Fatigue testing - Fatigue crack growth method
ASTM E 647 2015	Standard Test Method for Measurement of Fatigue Crack Growth Rates
ASTM E 399 2012	Standard Test Method for Linear-Elastic Plane-Strain Fracture Toughness $K_{Ic}$ of Metallic Materials



The tests in the fields of the flexible accreditation are characterized by the test statistics mentioned in the following tables.

Method	Test	Exemplary standard	
1	Quasi-static tests under temperature and/or media impact	Tensile test at RT	DIN EN ISO 6892-1 DIN EN ISO 6892-2
		Compression test at RT	DIN EN ISO 6892-3
		Tensile test at elevated temperatures	DIN ISO 15579 ASTM D 695
		Tensile test at low temperatures	ASTM D 3039 ASTM D 3518
		Bending test	ASTM D 3528 ASTM D 5656
		Torsion test	ASTM D 5961 ASTM D 6484 ASTM D 7332
2	Single- and multi-stage fatigue tests under temperature and/or media impact	Test under axial load (Tension/Compression)	DIN 50100 ASTM E 466-96
		Bending test	
		Rotating bending test	
		Torsion test	
		Single- and multi-channel fatigue tests for components	
3	Fatigue tests with operating loads under temperature and/or media impact	Single- and multi-channel fatigue tests for components	DIN 50100
4	Fracture mechanical tests under temperature and/or media impact	Crack propagation testing	ISO 12108 ASTM E 647-05
		Estimation of fracture toughness	ASTM E 399-09

#### 4 Vibration tests and earthquake simulation without / with climatical terms \*

IEEE 693 2005	Recommended Practice for Seismic Design of Substations
ANSI/IEEE 344 2004	Recommended Practice for Seismic Qualification for Class 1E Equipment for Nuclear Power Generating Stations
ANSI/IEEE 382 2006	Standard for Qualification of Safety-Related Actuators for Nuclear Power Generating Stations
KTA 2201.4 2012-11	Design of Nuclear Power Plants against Seismic Events - Part 4: Requirements for Procedures for Verifying the Safety of Mechanical and Electrical Components against Earthquakes
KTA 3504 2015-11	Electrical Drive Mechanisms of the Safety System in Nuclear Power Plants
DIN EN 60068-2-6 2008-10	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)
DIN EN 60068-2-57 2015-10	Environmental testing - Part 2-57: Tests - Test Ff: Vibration - Time-history and sine-beat method
DIN EN 60068-2-64 2009-04	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance
DIN IEC 60068-3-3 1993-09	Environmental testing; seismic test methods for equipments; guidance
DIN EN 300019-2-3 2016-07	Environmental Engineering (EE) - Environmental conditions and environmental tests for telecommunications equipment - Part 2-3: Specification of environmental tests; Stationary use at weatherprotected locations
DIN EN 300019-2-4 2016-07	Environmental Engineering (EE) - Environmental conditions and environmental tests for telecommunications equipment - Part 2-4: Specification of environmental tests; Stationary use at non-weatherprotected locations
DIN EN 60255-21-3 1995-11	Electrical relays - Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment; section 3: Seismic tests

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IEC 60980 1989-06	Recommended practices for seismic qualification of electrical equipment of the safety system for nuclear generating stations
DIN EN 61373 2011-04	Railway applications - Rolling stock equipment - Shock and vibration tests
DIN EN 61587-2 2012-06	Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 - Part 2: Seismic tests for cabinets and racks
DIN EN 62271-207 2013-02	High-voltage switchgear and controlgear - Part 207: Seismic qualification for gas-insulated switchgear assemblies for rated voltages above 52 kV
DIN EN 1998-1 2010-12	Eurocode 8: Design of structures for earthquake resistance - Part 1: General rules, seismic actions and rules for buildings
GR-63-CORE NEBS 2012-04	Network Equipment-Building System Requirements: Physical Protection
IEC TS 62271-210 2013	High-voltage switchgear and controlgear - Part 210: Seismic qualification for metal enclosed and solid-insulation enclosed switchgear and controlgear assemblies for rated voltages above 1 kV and up to and including 52 kV
ICC-ES AC156 2015-05	Acceptance criteria for seismic certification by shake-table testing of nonstructural components
RCC-E 2016	Design and construction rules for electrical equipment of PWR nuclear islands (Restriction: <i>only seismic vibration tests</i> )
IEC/TR 62271-300 2006	High-voltage switchgear and controlgear - Part 300: Seismic qualification of alternating current circuit-breakers (Restriction: <i>only seismic vibration tests</i> )
IEC/IEEE 60780-323 2016-04	IEC/IEEE International Standard - Nuclear facilities - Electrical equipment important to safety - Qualification
STANAG 4370 2014-09	ENVIRONMENTAL TESTING AECTP-400: Mechanical environmental tests - Method 401: Vibration (Restriction: <i>only seismic vibration tests</i> ) ( <i>withdrawn document</i> )

**Schedule 1:**

Type of test	Typical test methods
Sine Sweep	DIN EN 60068-2-6 DIN EN 60980 DIN EN 60068-3-3
Sinus Beat	DIN EN 60068-2-57
Sinus (fixed frequency)	DIN EN 60068-2-6
Broadband random	DIN EN 60068-2-64 STANAG AECTP 400 Method 401 DIN EN 61373
Synthetically generated operating basis and safe shutdown earthquakes; Real-time earthquake loadings	DIN EN 300019-2-3 DIN EN 300019-2-4 DIN EN 60068-3-3 DIN EN 60980 DIN EN 60068-2-57 DIN EN 60255-21-3 KTA 2201.4 IEEE 693 IEEE 344 IEEE 382 IEC/IEEE 60780-323 IEC 62271-207 IEC 62271-300 IEC TS 62271-210 GR-63-CORE NEBS ICC-ES AC156 RCC-E B8400 DIN EN 1998-1
APC Air Plane Crash	KTA 2201.4 KTA 3504
Windmilling: FBO Fan Blade Out SEI Sustained Engine Imbalance LGTB Landing Gear Tyre Burst	STANAG AECTP 400 Method 401
Operation load simulation trial	IEEE 693 DIN EN 61587-2 GR-63-CORE NEBS

**Schedule 2:**

Type of test	Typical test methods
Sine Sweep	DIN EN 60068-2-6 DIN EN 60980 DIN EN 60068-3-3
Sinus Beat	DIN EN 60068-2-57
Sinus (fixed frequency)	DIN EN 60068-2-6
Broadband random	DIN EN 60068-2-64 STANAG AECTP 400 Method 401 DIN EN 61373
Synthetically generated operating basis and safe shutdown earthquakes; Real-time earthquake loadings	DIN EN 300019-2-3 DIN EN 300019-2-4 DIN EN 60068-3-3 DIN EN 60068-2-57 DIN EN 60225-21-3 IEEE 382 GR-63-CORE NEBS DIN EN 1998-1
APC Air Plane Crash	KTA 2201.4 KTA 3504
Windmilling: BFO Fan Blade Out SEI Sustained Engine Imbalance LGTB Landing Gear Tyre Burst	STANAG AECTP 400 Method 401
Operation load simulation trial	DIN EN 61587-2 GR-63-CORE NEBS

**Schedule 3:**

Type of test	Typical test methods
Sine Sweep	DIN EN 60068-2-6, DIN EN 60068-3-3 DIN EN 60980
Sinus Beat	DIN EN 60068-2-57
Sinus (fixed frequency)	DIN EN 60068-2-6
Broadband random	DIN EN 60068-2-64 STANAG AECTP 400 Method 401 DIN EN 61373
Synthetically generated operating basis and safe shutdown earthquakes; Real-time earthquake loadings	DIN EN 300019-2-3 DIN EN 300019-2-4 DIN EN 60068-3-3 DIN EN 60980 DIN EN 60068-2-57 DIN EN 60225-21-3 KTA 2201.4 IEEE 693 IEEE 344 IEEE 382 IEC/IEEE 60780-323 IEC 62271-207 IEC 62271-300 IEC TS 62271-210 GR-63-CORE NEBS ICC-ES AC156 RCC-E B8400 DIN EN 1998-1
APC Air Plane Crash	KTA 2201.4, KTA 3504
Windmilling: FBO Fan Blade Out SEI Sustained Engine Imbalance LGTB Landing Gear Tyre Burst	STANAG AECTP 400 Method 401
Operation load simulation trial	IEEE 693 DIN EN 61587-2 GR-63-CORE NEBS

## 5 Environmental tests

DIN EN 60068-2-1 2008-01	Environmental testing - Part 2-1: Tests - Test A: Cold
DIN EN 60068-2-2 2008-05	Environmental testing - Part 2-2: Tests - Test B: Dry heat
DIN EN 60068-2-14 2010-04	Environmental testing - Part 2-14: Tests - Test N: Change of temperature (here: <i>Test Na and Nb</i> )
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 60068-2-38 2010-06	Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test
DIN EN 60068-2-78 2014-02	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state
ISO 16750-4 2010-04	Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 4: Climatic loads
RTCA DO-160 G 2010	Radio Technical Commission for Aeronautics Environmental Conditions and Test Procedure for Airborne Equipment (here: <i>Section 4.5.1 to 4.5.5 - Temperature and Attitude</i> <i>Section 5 - Temperature Variation</i> <i>Section 6 - Humidity</i> )

**abbreviations used:**

ANSI	American National Standards Institution
ASTM	American Society for Testing and Materials
AECTP	Allied Environmental Conditions and Test Publication
EMBRAER	Embresa Brasileira de Aeronáutica S. A.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
KTA	Kerntechnischer Ausschuss
MIL-STD	Military-Standards
RTCA	Radio Technical Commission for Aeronautics
SEP	Iron and Steel test sheets from German Iron and Steel Institute
STANAG	Standardization Agreement (Standardization Agreement of NATO Contracting States concerning the use of standardized procedures or similar equipment. The STANAG guidelines issued by the NATO Standardization Office (NSO)).