

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

SPIE SAG GmbH
Balcke-Dürr-Allee 7, 40882 Ratingen

at the location:

Versuchs- und Technologiezentrum
Pittlerstraße 44, 63225 Langen

is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out tests in the following fields:

selected tests of the surface and strengths at fasteners;
mechanical-technological tests and hardness test at metals;
element analysis at iron- and aluminium-alloys;
wall- and layer thickness;
concrete testing, static and dynamic strength tests at conductor cables, insulators and valves for overhead lines - Measurement of forces, accelerations, strains, temperatures and geometric sizes

The accreditation certificate shall only apply in connection with the notice of accreditation of 05.07.2022 with the accreditation number D-PL-17453-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 9 pages.

Registration number of the certificate: **D-PL-17453-01-00**

Berlin,
05.07.2022

Dr. Tobias Poeste
Head of Technical Unit

Translation issued:
02.12.2022


Head of Technical Unit

The certificate together with the annex reflects the status as indicated by the date of issue.

The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de/en/accredited-bodies-search.html>.

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

See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-17453-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 05.07.2022

Date of issue: 02.12.2022

Holder of certificate:

SPIE SAG GmbH
Balcke-Dürr-Allee 7, 40882 Ratingen

at the location:

Versuchs- und Technologiezentrum
Pittlerstraße 44, 63225 Langen

Tests in the fields:

selected tests of the surface and strengths at fasteners;
mechanical-technological tests and hardness test at metals;
element analysis at iron- and aluminium alloys;
wall- and layer thickness measurements;
concrete testing, static and dynamic strength tests at conductor cables, insulators and valves for overhead lines - measurement of forces, accelerations, strains, temperatures and geometric sizes

Within the given testing field market 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 management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories. Laboratories that conform to the requirements of this standard, operate generally in accordance with the principles of DIN EN ISO 9001.

*The certificate together with the annex reflects the status as indicated by the date of issue.
The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de/en/content/accredited-bodies-dakks>.*

Abbreviations used: see last page

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

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

1 Tests on fasteners*

DIN EN ISO 898-1 2013-05	Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs with specified property classes - Coarse thread and fine pitch thread (except: <i>sections 9.10-9.13</i>)
DIN EN ISO 898-2 2012-08	Mechanical properties of fasteners made of carbon steel and alloy steel - Part 2: Nuts with specified property classes - Coarse thread and fine pitch thread

2 Mechanical-technological tests at metallic materials *

DIN EN ISO 6506-1 2015-02	Metallic materials - Brinell hardness test - Part 1: Test method
DIN EN ISO 6507-1 2018-07	Metallic materials - Vickers hardness test - Part 1: Test method
DIN EN ISO 6508-1 2016-12	Metallic materials - Rockwell hardness test - Part 1: Test method (only: <i>Scales B and C</i>)
DIN EN ISO 6892-1 2020-06	Metallic materials - Tensile testing - Part 1: Method of test at room temperature
DIN EN ISO 148-1 2011-01	Metallic materials - Charpy pendulum impact test - Part 1: Test method

3 Element analysis of iron and aluminium alloys*

DIN EN 14726 2019-06	Aluminium and aluminium alloys - Determination of the chemical composition of aluminium and aluminium alloys by spark optical emission spectrometry (here: <i>the elements Si, Fe, Cu, Mn, Mg, Zn, Ni, Cr, Pb, Sn, Ti, Ag, Zr, V, Ga</i>)
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DIN EN ISO 15351
2010-08 Steel and iron - Determination of nitrogen content - Thermal conductimetric method after fusion in a current of inert gas (Routine method)

ASTM E 1019
2018 Standard Test Methods for Determination of Carbon, Sulfur, Nitrogen, and Oxygen in Steel, Iron, Nickel, and Cobalt Alloys by Various Combustion and Inert Gas Fusion Techniques (Combustion analysis)
(here: *only nitrogen (Nitrogen)*)

In-house test procedure excluded from the flexible scope

PA 10/16-VTZ
2022-04 Element analysis on metals - Emission spectrometric determination with spark excitation of the elements C, Si, Mn, P, S, Al, Cu, Cr, Ni, Mo, Nb, Ti, V, Co in iron materials; Si, Fe, Cu, Mn, Mg, Zn, Ni, Cr, Pb, Sn, Ti, Ag, Zr, V, Ga in aluminium and aluminium alloys - Determination of the nitrogen content in steel by means of hot extrusion

4 Layer thickness measurements*

DIN EN ISO 2178
2016-11 Non-magnetic coatings on magnetic substrates - Measurement of coating thickness - Magnetic method

DIN EN ISO 1461
2009-10 Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods

In-house test procedure excluded from the flexible scope

PA 11-VTZ
2012-02 Measurement of coating thickness and sound velocity using ultra sonic

5 Concrete tests*

DIN EN 14630
2007-01 Products and systems for the protection and repair of concrete structures - Test methods - Determination of carbonation depth in hardened concrete by the phenolphthalein method

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6 Static and dynamic strength tests on conductors, insulators and fittings for overhead lines - Measurement of forces, accelerations, strains, temperatures and geometric parameters **

DIN EN 60652 VDE 0210-15 2004-06	Loading tests on overhead line structures
DIN EN 795 2012-10	Personal fall protection equipment - Anchor devices
VDE-AR-N 4210-3 2011-05	Test and evaluation methods for determining the load capacity of structural members made of Thomas steel in steel lattice overhead line towers with nominal voltages of 110 kV and above
DIN EN 61284 1998-05	Overhead lines - Requirements and tests for fittings (Tests in sections 9, 11, 12, 13 (only: Class A))
DIN EN 61897 1999-08	Overhead lines - Requirements and tests for Aeolian vibration dampers (except: Section 7.10)
IEEE 664 1993	IEEE Guide on the Laboratory Measurement of the Power Dissipation Characteristics of Aeolian Vibration Dampers for single Conductors
DIN EN 61854 VDE 0212-2 1999-08	Overhead lines - Requirements and tests for spacers (Tests in section 7.5)
DIN EN 50483-5 VDE 0278-483-5 2009-11	Test requirements for low voltage aerial bundled cable accessories - Part 5: Electrical ageing test
DIN EN 62568 VDE 0212-357 2010-10	Method for fatigue testing of conductors for overhead lines
DIN EN 62567 VDE 0212-356 2014-07	Overhead lines - Methods for testing self-damping characteristics of conductors (<i>withdrawn standard</i>)

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DIN 45667 1969-10	Classification methods for evaluation of random vibrations
DIN EN 61395 1998-11	Overhead electrical conductors - Creep test procedures for stranded conductors
CIGRE Recommendation, in: Electra No. 63, p. 103 1979	Recommendations for the evaluation of the lifetime of transmission line conductors
CIGRE Guide CIGRE SC 22 WG 11, TF 2 Entwurf 1992	Guide to vibration measurements on overhead lines
DIN ISO 2176 1997-05	Petroleum products - Lubricating grease - Determination of dropping point
DIN EN 50326 2003-01	Leiter für Freileitungen - Eigenschaften von Fetten <i>(Tests in section 6.13)</i>
IEC 61394 2011 + Corrigendum 1: 2012	Overhead lines - Requirements for greases for aluminium, aluminium alloy and steel bare conductors <i>(Tests in section 5.10 and Annex C)</i>
IEC 61089 1991-05 with Amendment 1: 2012	Round Wire Concentric Lay Overhead Electrical Stranded Conductors
DIN EN 60889 1997-08	Conductors for overhead lines - Characteristics of greases <i>(Tests in section 10)</i>
DIN EN 50189 2000-09	Conductors for overhead lines - Zinc coated steel wires
IEC 60888 1987	Zinc coated steel wires for stranded conductors
DIN EN 10244-1 2009-08	Steel wire and wire products - Non-ferrous metallic coatings on steel wire - Part 1: General principles
DIN EN 10244-2 2009-08	Steel wire and wire products - Non-ferrous metallic coatings on steel wire - Part 2: Zinc or zinc alloy coatings

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DIN EN 10244-3 2001-07	Steel wire and wire products - Non-ferrous metallic coatings on steel wire - Part 3: Aluminium coatings
DIN EN 50183 2000-12	Conductors for overhead lines - Aluminium-magnesium-silicon alloy wires
DIN EN 61232 2001-09	Aluminium-clad steel wires for electrical purposes (here only: <i>Chapter 6</i>)
IEC 60104 1987	Aluminium-Magnesium-Silikon Alloy Wire for Overhead Line Conductors
IEC 61232 1993-06	Aluminium Clad steel wires for electrical purposes
DIN EN 50182 2001-12 with correction 1 2006-08	Conductors for overhead lines - Round wire concentric lay stranded conductors (with the material standards listed in Tab. NA1)
DIN EN 50540 VDE 0212-355 2011-04	Conductors for overhead lines - Aluminium Conductors Steel Supported (ACSS)
DIN EN 62219 2003-01	Overhead electrical conductors - Formed wire, concentric lay, stranded conductors
DIN EN 62420 VDE 0212-354 2009-03	Concentric lay stranded overhead electrical conductors containing one or more gap(s)
DIN EN 10218-1 2012-03	Steel wire and wire products - General - Part 1: Test methods
DIN ISO 7800 2013-09	Metallic Materials - Wire - Simple torsion test
DIN ISO 7801 2008-10	Metallic Materials - Wire - Reverse bend test
DIN ISO 7802 2014-11	Metallic materials - Wire - Wrapping test

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DIN EN 62004 VDE 0212-303 2010-05	Thermal-resistant aluminium alloy wire for overhead line conductor
E DIN EN 62641 VDE 0212-304 2015-11	Conductors for overhead lines - Aluminium and aluminium alloy wires for concentric lay stranded conductors
DIN EN 50397-2 VDE 0276-397-2 2010-05	Covered conductors for overhead lines and the related accessories for rated voltages above 1 kV AC and not exceeding 36 kV AC - Part 2: Accessories for covered conductors - Tests and acceptance criteria <i>(Tests in sections 7.1-7.5, 7.7)</i>
DIN IEC 60468 1981-03	Method of measurement of resistivity of metallic materials
DIN EN 60794-4 VDE 0888-111-1 2004-05	Optical fibre cables - Part 4-10: Family specification - Optical ground wires (OPGW) along electrical power lines <i>(Tests in sections 9.2-9.5, 9.10, 9.11, 9.15)</i>
DIN EN 60794-1-21 2016-12	Optical fibre cables - Part 1-21: Generic specification - Basic optical cable test procedures - Mechanical tests methods
IEEE 1138 2009+ Corrigendum 1 2014	Standard for testing and performance for Optical Ground Wire (OPGW) for use on electric utility power lines <i>(Tests in sections 6.4.1, 6.4.2 (without optical properties), 6.4.3.1, 6.4.3.2, 6.4.3.5, 6.4.3.6, 6.5 without 6.5.3.2)</i>
DIN EN 60168 2001-12	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1 kV <i>(Tests in sections 3.3.4, 5.2, 5.3, 5.7)</i>
DIN EN 60383-1 1997-05 mit Berichtigung 1 2001-08	Insulators for overhead lines with a nominal voltage above 1 kV - Part 1: Ceramic or glass insulator units for a.c. systems - Definitions, test methods and acceptance criteria <i>(Tests in sections 17-24, 26-28, 29.3, 31.3, 32.2)</i>
DIN EN 62155 2004-03	Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1000 V <i>(Tests in sections 7.2, 7.3, 7.5, 8, 10.5, 10.6)</i>

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DIN EN 61109 2009-06	Insulators for overhead lines - Composite suspension and tension insulators for a.c. systems with a nominal voltage greater than 1000 V - Definitions, test methods and acceptance criteria (IEC 61109:2008) <i>(Tests in sections 10.3, 10.4, 11.2, 12.2, 12.4, 12.5)</i>
IEC 61952 2008	Insulators for overhead lines - Composite line post insulators for alternative current with a nominal voltage >1000 V <i>(Tests in sections 10.3, 10.4, 11.2, 12, 13)</i>
DIN EN 61462 2008-06	Composite hollow insulators - Pressurized and unpressurized insulators for use in electrical equipment with rated voltage greater than 1000 V - Definitions, test methods, acceptance criteria and design recommendations <i>(Tests in sections 8 and 9)</i>
DIN EN 62231 VDE 0674-7 2007-07 IEC 62231 2006-04	Composite station post insulators for substations with a.c. voltages greater than 1000 V up to 245 kV - Definitions, test methods and acceptance criteria <i>(Tests in sections 9.3 and 10)</i>
DIN EN ISO 3452-1 2014-09	Non-destructive testing - Penetrant testing - Part 1: General principles

In-house test procedure excluded from the flexible scope

BGR140/DGUV Regel 103-005 2002-01	Use of riser bolts and rizer bolt manholes
PA 20 VTZ 2012-03	Measurement of the longitudinal coefficient of thermal expansion of conductors for overhead line
PA 21 VTZ 2012-03	Measurement of the transition point of conductors for overhead lines
PA 22 VTZ 2012-03	Non-contact temperature measurements by using of infrared camera

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PA 23 VTZ 2012-03	Measurement of the DC resistance of conductors for overhead lines
PA 10/5-VTZ 1996-02	Tensile force-torque measurement
PA 10/6-VTZ 1997-06	Tests on insulators - chain tests (load redistribution)

Abbreviations used:

ASTM	American Society for Testing Materials
BGR	Trade association rules for safety and health at work
CIGRE	Conférence Internationale des Grands Réseaux Électriques
DGUV	German Statutory Accident Insurance
DIN	German Institute for Standardization r. a.
EN	European Standard
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
ISO	International Organization for Standardization
PA-VTZ	Inhouse-method of the SPIE SAG GmbH
VDE	Association of Electrical, Electronic & Information Technologies r. a.