

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-18511-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 17.03.2021

Date of issue: 17.03.2021

Holder of certificate:

**TÜV Rheinland Werkstoffprüfung GmbH
Im Kraftwerk Jänschwalde, 03182 Peitz**

at locations:

**Am Grauen Stein, 51105 Köln
Hertzstraße 70, 13158 Berlin**

Tests in the fields:

manual non-destructive testing methods (radiographic-, ultrasonic-, eddy current-, magnetic particle-, penetration-, leak-, and visual testing), mechanized ultrasound testing, strain measurements as well as mobile Hardness test at metallic material in the metal production and metalworking industry, in the plant engineering as well as at systems- and mechanical engineering; corrosion tests, mechanical test, metallographic analysis and impression method at metallic material;

**Analytics of measurement filters or solids on inorganic fibrous particles;
chemical Analysis on Metals;**

Optical Emission Spectroscopy (OES) on ferrous materials, nickel-based, Copper-based and aluminium alloys as well as hardness test on metallic materials

Within the given testing field marked with *, the testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use standards or equivalent testing

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 may be found respectively in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH <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.

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methods listed here with different issue dates. The testing laboratory maintains a current list of all testing methods within the flexible scope of accreditation.

The testing methods are marked with the following symbols for the sites at which they are performed:

Berlin (B) Köln (K)

1 Non-destructive testing*

1.1 Radiographic testing

DIN EN ISO 5579 2014-04	Non-destructive testing - Radiographic testing of metallic materials using film and X- or gamma rays - Basic rules (here: <i>chapter 6</i>)	B, K
DIN EN ISO 17636-1 2013-05	Non-destructive testing of welds - Radiographic testing - Part 1: X- and gamma-ray techniques with film	B, K
DIN EN ISO 17636-2 2013-05	Non-destructive testing of welds - Radiographic testing - Part 2: X- and gamma-ray techniques with digital detectors	B, K
DIN EN 12681-1 2018-02	Founding - Radiographic testing - Part 1: Film techniques	B, K
DIN EN 13068-3 2001-12	Non-destructive testing - Radioscopic testing - Part 3: General principles for the radioscopic testing of metallic materials by X- and gamma rays	B, K
DVGW GW 350 2015-06	Welding Joints of Steel Pipelines for Gas and Water Supply - Manufacturing, Testing and Evaluation (here: <i>chapter 9</i>)	B, K
AD 2000-data sheets HP 5/3 Annex 1 2015-04	Non-destructive testing of welded joints - Minimum requirements for non-destructive testing methods (here: <i>chapter 9</i>)	B, K

1.2 Ultrasonic testing

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DIN EN ISO 16810 2014-07	Non-destructive testing - Ultrasonic testing - General principles (here: <i>chapter 9</i>)	B, K
DIN EN ISO 17640 2019-02	Non-destructive testing of welds - Ultrasonic testing - Techniques, testing levels, and assessment (here: <i>chapter 7-10 and Annex A</i>)	B, K
DIN 54123 1980-10	Non-destructive Test; Ultrasonic Method of Testing Claddings, Produced by Welding, Rolling and Explosion (<i>withdrawn standard</i>)	B, K
SEL 072 1977-12	Ultrasonically tested heavy plate - technical delivery specifications (<i>withdrawn standard</i>)	B, K
DIN EN 10160 1999-09	Ultrasonic testing of steel flat product of thickness equal to or greater than 6 mm (reflection method)	B, K
SEP 1915 1994-09	Ultrasonic test of steel pipes for aberration (<i>withdrawn document</i>)	B, K
DIN EN ISO 10893-10 2011-07	Non-destructive testing of steel tubes - Part 10: Automated full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of longitudinal and/or transverse imperfections	B, K
SEP 1916 1989-12	Non-destructive testing fusion welded ferritic steel pipes	B, K
SEP 1918 1992-01	Ultrasonic test of steel pipes for transverse defects (<i>withdrawn document</i>)	B, K
SEP 1919 1977-06	Ultrasonic testing for laminations of pipes of creep-resistant steels (<i>withdrawn document</i>)	B, K
DIN EN ISO 10893-8 2011-07	Non-destructive testing of steel tubes - Part 8: Automated ultra- sonic testing of seamless and welded steel tubes for the detection of laminar imperfections	B, K
SEP 1920 1984-12	Ultrasonic testing of rolled semi-finished products on internal material discontinuities	B, K
SEP 1922 1985-07	Ultrasonic testing of forgings of ferritic steel (<i>withdrawn document</i>)	B, K

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SEP 1923 2009-02	Ultrasonic testing of steel forgings to stringent standards, in particular for components in turbine and generator systems	B, K
DIN EN 12680-1 2003-06	Founding - Ultrasonic examination - Part 1: Steel castings for general purposes	B, K
DIN EN 12680-2 2003-06	Founding - Ultrasonic examination - Part 2: Steel castings for highly stressed components	B, K
DIN EN 12680-3 2012-02	Founding - Ultrasonic testing - Part 3: Spheroidal graphite cast iron castings	B, K
SEP 1924 1989-10	Ultrasonic testing of castings made of cast iron with spheroidal-graphite <i>(withdrawn document)</i>	B, K
DIN EN 10228-3 2016-10	Non-destructive testing of steel forgings - Part 3: Ultrasonic testing of ferritic or martensitic steel forgings	B, K
DIN ISO 4386-1 2015-12	Plain bearings - Metallic multilayer plain bearings - Part 1: Non-destructive ultrasonic testing of bond of thickness $\geq 0,5$ mm	B, K
DIN EN 14127 2011-04	Non-destructive testing - Ultrasonic thickness measurement <i>(withdrawn standard)</i>	B, K
DIN EN ISO 16809 2020-02	Non-destructive testing - Ultrasonic thickness measurement	B, K
DIN EN ISO 17635 2017-04	Non-destructive testing of welds - General rules for metallic materials (here: <i>Ultrasonic testing</i>) (here: <i>chapter 6 and Annex A</i>)	B, K
AD 2000-data sheets HP 5/3 Annex 1 2015-04	Non-destructive testing of welded joints - Minimum requirements for non-destructive testing methods (here: <i>Ultrasonic testing</i>)	B, K
SEP 1914 1983-08	Non-destructive testing of fusion-welded seams in pipes of stainless steels	B, K
SEP 1917 1994-09	Non-destructive testing of resistance welded pipes of ferritic steels	B, K

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DIN EN 10228-4 2016-10	Non-destructive testing of steel forgings - Part 4: Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings	B, K
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1.3 Magnetic particle inspection

DIN EN ISO 9934-1 2017-03	Non-destructive testing - Magnetic particle testing - Part 1: General principles (here: <i>chapter 7-14</i>)	B, K
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DIN EN ISO 17638 2017-03	Non-destructive testing of welds - Magnetic particle testing	B, K
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SEP 1935 1982-06	Seam testing of castings of steel - magnetic powder test (<i>withdrawn document</i>)	B, K
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DIN EN 1369 2013-01	Founding - Magnetic particle testing	B, K
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DIN EN ISO 17635 2017-04	Non-destructive testing of welds - General rules for metallic materials	B, K
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DIN 54130 1974-04	Non-destructive testing; magnetic leakage flux testing, general (<i>withdrawn standard</i>)	B, K
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AD 2000-data sheet HP 5/3 Annex 1 2015-04	Non-destructive testing of welded joints - Minimum requirements for non-destructive testing methods (here: <i>for Magnetic particle inspection</i>)	B, K
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DIN EN 10228-1 2016-10	Non-destructive testing of steel forgings - Part 1: Magnetic particle inspection	B, K
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1.4 Penetrant testing

DIN EN ISO 3452-1 2014-09	Non-destructive testing - Penetrant testing - Part 1: General principles (here: <i>chapter 6</i>)	B, K
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SEP 1936 1982-06	Seam testing of castings of steel - penetration testing (<i>withdrawn standard</i>)	B, K
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DIN EN 1371-1 2012-02	Founding - Liquid penetrant testing - Part 1: Sand, gravity die and low pressure die castings	B, K
DIN EN 1371-2 2015-04	Founding - Liquid penetrant testing - Part 2: Investment castings	B, K
DIN ISO 4386-3 2020-04	Plain bearings - Metallic multilayer plain bearings - Part 3: Non-destructive penetrant testing	B, K
DIN EN 1559-2 2014-12	Founding - Technical conditions of delivery - Part 2: Additional requirements for steel castings	B, K
DIN EN ISO 17635 2017-04	Non-destructive testing of welds - General rules for metallic materials (here: <i>Penetrant testing</i>) (here: <i>chapter 6 and Annex A</i>)	B, K
DIN EN ISO 3452-5 2009-04	Non-destructive testing - Penetrant testing - Part 5: Penetrant testing at temperatures higher than 50 °C	B, K
DIN EN ISO 3452-6 2009-04	Non-destructive testing - Penetrant testing - Part 6: Penetrant testing at temperatures lower than 10 °C	B, K
AD 2000-data sheet HP 5/3 Annex 1 2015-04	Non-destructive testing of welded joints - Minimum requirements for non-destructive testing methods (here: <i>Penetrant testing</i>)	B, K
DIN EN 10228-2 2016-10	Non-destructive testing of steel forgings - Part 2: Penetrant testing	B, K

1.5 Leak testing

DIN EN 1593 1999-11	Non-destructive testing - Leak testing - Bubble emission techniques	K
DIN EN ISO 20485 2018-05	Non-destructive testing - Leak testing - Tracer gas method	K

1.6 Visual testing

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DIN EN ISO 17637 2017-04	Non-destructive testing of welds - Visual testing of fusion-welded joints	B, K
DIN EN 13018 2016-06	Non-destructive testing - Visual testing - General principles (here: <i>chapters 5 + 6</i>)	B, K
AD 2000-data sheet HP 5/1 2008-02	Manufacture and testing of joints - Procedural basics (here: <i>Visual testing</i>)	B, K
DIN EN ISO 17635 2017-04	Non-destructive testing of welds - General rules for metallic materials (here: <i>Visual testing</i>) (here: <i>chapter 6 and Annex A</i>)	B, K
DIN EN 1370 2012-03	Founding - Examination of surface condition	B, K

1.7 Strain measurement

VDI/VDE/GESA 2635 Sheet 2 2019-12	Experimental structural analysis - Recommended practice for high-temperature strain measurements	K
VdTÜV-data sheet 803 2008-10	Guidelines for the execution and evaluation of elongation measurements by wire strain gauges (DMS)	K

2 Mechanical testing*

2.1 Tensile- and creep tests

DIN EN ISO 4136 2013-02	Destructive tests on welds in metallic materials - Transverse tensile test	K
DIN EN ISO 9017 2018-04	Destructive tests on welds in metallic materials - Fracture test	K
DIN EN ISO 6892-1 2017-02	Metallic materials - Tensile testing - Part 1: Method of test at room temperature (here: <i>Procedure B</i>)	K
DIN EN ISO 6892-2 2018-09	Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature	K
ASTM E21 2017	Standard Test Methods for Elevated Temperature Tension Tests of Metallic Materials	K

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DIN EN ISO 204 2009-10	Metallic materials - Uniaxial creep testing in tension - Method of test	K
DIN EN ISO 5178 2019-05	Destructive tests on welds in metallic materials - Longitudinal tensile test on weld metal in fusion welded joints	K
DIN EN ISO 8493 2004-10	Metallic materials - Tube - Drift-expanding test	K
DIN EN ISO 8496 2014-03	Metallic materials - Tube - Ring tensile test	K
DIN EN ISO 6892-3 2015-07	Metallic materials - Tensile testing - Part 3: Method of test at low temperature	K
VdTÜV data sheet 1158 1985-06	Procedure test for welding tubes into tube plates (here: <i>tube pull-out and push-out test</i>) (<i>withdrawn document</i>)	K
ASTM E 8/E 8M 2016	Test Methods for Tension Testing of Metallic Materials	K

2.2 Impact and bending tests

DIN EN ISO 5173 2012-02	Destructive tests on welds in metallic materials - Bend tests	K
DIN EN ISO 148-1 2017-05	Metallic materials - Charpy pendulum impact test - Part 1: Test method	K
DIN EN ISO 7438 2016-07	Metallic materials - Bend test	K
DIN EN ISO 8492 2014-03	Metallic materials - Tube - Flattening test	K
ASTM E 23 2018	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials	K

2.3 Hardness tests

DIN EN ISO 6506-1	Metallic materials - Brinell hardness test - Part 1: Test method	B, K
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2015-02

DIN EN ISO 6507-1 2018-07	Metallic materials - Vickers hardness test - Part 1: Test method	B, K
DIN EN ISO 6508-1 2016-12	Metallic materials - Rockwell hardness test - Part 1: Test method	K
DIN EN ISO 16859-1 2016-02	Metallic materials - Leeb hardness test - Part 1: Test method	K
DIN 50159-1 2015-01	Metallic materials - Hardness testing with the UCI method - Part 1: Test method	B, K
ASTM E10 2018	Standard Test Methods for Brinell Hardness of Metallic Materials	K
ASTM E18 2019	Standard Test Methods Rockwell Hardnes of Metallic Materials	K
ASTM E92 2017	Standard Test Methods for Vickers Hardness and Knoop Hardnes of Metallic Materials	K

3 mechanical and functional test on components*

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	K
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	K
DIN EN ISO 2320 2016-05	Fasteners - Prevailing torque steel nuts - Functional properties	K

4 Surface texture*

DIN EN ISO 4288 1998-04	Geometrical Product Specifications (GPS) - Surface texture: Profile method - Rules and procedures for the assessment of surface texture	K
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5 Corrosion tests*

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DIN EN ISO 9227 2017-07	Corrosion tests in artificial atmospheres - Salt spray tests	K
DIN EN ISO 3651-1 1998-08	Determination of resistance to intergranular corrosion of stainless steels - Part 1: Austenitic and ferritic-austenitic (duplex) stainless steels - Corrosion test in nitric acid medium by measurement of loss in mass (Huey test)	K
DIN EN ISO 3651-2 1998-08	Determination of resistance to intergranular corrosion of stainless steels - Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels - Corrosion test in media containing sulfuric acid	K
DIN EN ISO 6270-2 2018-04	Paints and varnishes - Determination of resistance to humidity - Part 2: Condensation (in-cabinet exposure with heated water reservoir)	K
DIN EN ISO 10289 2001-04	Methods for corrosion testing of metallic and other inorganic coatings on metallic substrates - Rating of test specimens and manufactured articles subjected to corrosion tests	K
ASTM A 262 2015	Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels	K
DIN EN 60068-2-11 2000-02	Environmental testing - Part 2: Tests; test Ka: Salt mist	K
DIN EN ISO 9400 1995-12	Nickel-based alloys - Determination of resistance to intergranular corrosion	K
ASTM A 923 2014	Standard Test Methods for Detecting Detrimental Intermetallic Phase in Duplex Austenitic/Ferritic Stainless Steels	K
ASTM G 48 2011	Standard Test Methods for Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys by Use of Ferric Chloride Solution	K
ASTM G 28 2002	Standard Test Methods for Detecting Susceptibility to Intergranular Corrosion in Wrought, Nickel-Rich, Chromium-Bearing Alloys	K
VDA sheet 621-415 1982	Cyclic corrosion testing of materials and components in automotive construction <i>(withdrawn document)</i>	K
SEP 1877 1994-07	Test of the resistance of high-alloy, corrosion-proof materials against intercrystalline corrosion	K

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6 Metallographic analysis*

DIN EN ISO 643 2013-05	Steels - Micrographic determination of the apparent grain size	K
DIN EN ISO 2624 1995-08	Copper and copper alloys - Estimation of average grain size	K
DIN 54150 1977-08	Non-destructive testing - impression methods for surface examination (Replica-technique) <i>(withdrawn standard)</i>	K
DIN EN ISO 9015-1 2011-05	Destructive tests on welds in metallic materials - Hardness testing - Part 1: Hardness test on arc welded joints	K
DIN EN ISO 2639 2003-04	Steels - Determination and verification of the depth of carburized and hardened cases	K
DIN 50190-3 1979-03	Hardness depth of heat-treated parts - determination of the effective depth of hardening after nitriding	K
DIN EN ISO 8249 2018-11	Welding - Determination of Ferrite Number (FN) in austenitic and duplex ferritic-austenitic Cr-Ni stainless steel weld metals	K
ASTM E 562 2019	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count	K
AVS D 63/50 2012-06	Determination of the content of delta ferrite in austenitic steel with ferritic segregation (procedure of AREVA NP GmbH)	K
VDTÜV-data sheet 451 83/6 1983-08	Surfaceanalysis on creep stress tested components (in compliants to TRD 508	K
ASTM E 112 2013	Standard Test Methods for Determining Average Grain Size	K
ASTM E 45a 2018	Standard Test Methods for Determining the Inclusion Content of Steel	K
SEP 1572 2019-03	Microscopic testing of free-cutting steels for sulfide non-metallic inclusions using standard images	K
ASTM A 923 2014	Standard Test Methods for Detecting Detrimental Intermetallic Phase in Duplex Austenitic/Ferritic Stainless Steels	K

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ASTM A 262 2015	Standard Practice for Detecting Susceptibility to intergranular Attack in Austenitic Stainless Steels	K
ASTM A342 / A342M 2014	Standard Test Methods for Permeability of Weakly Magnetic Materials	K
ISO 4967 2013-07	Steel - Determination of content of non-metallic inclusions - Micro-graphic method using standard diagrams	K
EURONORM 103 1971	Microscopic determination of the ferrite or austenitic grain size of steels <i>(withdrawn document)</i>	K
ISO 4968 1979-11	Steel - Macrographic examination by sulfur print (Baumann method)	K
DIN EN ISO 945-1 2019-10	Microstructure of cast irons - Part 1: Graphite classification by visual analysis	K
DIN EN 10328 2005-04	Iron and steel - Determination of the conventional depth of hardening after surface heating	K

7 Analytcs of measuring filters or solids of inorganic fibrous particle*

VDI 3492 2013-06	Indoor air measurement - Ambient air measurement - Measurement of inorganic fibrous particles - Scanning electron microscopy method	K
VDI 3861 Sheet 2 2008-01	Stationary source emissions - Measurement of inorganic fibrous particles in exhaust gas - Scanning electron microscopy method	K
BGI/GUV-I 505-46 2014-02	Method for determining different inorganic fibrous particles separately - Scanning electron microscopy method (without sampling)	K
VDI 3866 Sheet 5 2017-06	Determination of asbestos in technical products - Scanning electron microscopy method <i>(here: with annex B - Köln)</i>	K
VDI 3877 Sheet 1 2011-09	Indoor air pollution - Measurement of fibrous dust on settled on surfaces - Sampling and analysis (REM/EDXA)	K

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8 Determination of chemical composition

QM-PA-20 2020-02	Optical spark emission spectroscopy to determine elements (18 elements) in ferrous materials and nickel-based alloys with C, Si, Mn, P, S, Cr, Mo, Ni, V, Al, Cu, Co, Pb, Nb, Ti, B, W, N - Copper alloys with elements (17 elements) Ag, Al, As, Be, Bi, Co, Cr, Fe, Mg, Mn, Ni, Pb, Si, Sn, Zn, Cd, Zr - Aluminium alloys with elements (23 elements) Ag, B, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Mg, Mn, Ni, Pb, Si, Sn, Sr, Ti, V, Zn, Zr, In	K
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Abbreviations used:

AD HP	Working group of pressure vessels; Production and testing
ASTM	American Society for Testing and Materials
AVS	Standard operation procedure
BGI	Employers' Liability Insurance Association Information
DIN	German Institute for Standardization
DVGW	German Technical and Scientific Association for Gas and Water
EN	European Standard
GESA	Association of experimental microstructure analysis
ISO	International Organization for Standardization
SEL	Steel-iron delivery conditions of the Association of German Steel
SEP	Steel and iron test sheet of the Association of German Steel Institute
VDA	German Association of the Automotive Industry
VDE	Association for Electrical, Electronical & Information Technologies
VDI	Association of German Engineers
VdTÜV	Association of TÜVs