Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-14153-02-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **12.01.2021**

Date of issue: 12.01.2021

Holder of certificate:

TÜV SÜD Industrie Service GmbH
Labor der Industrie Service
Westendstraße 199, 80686 München

at the locations:

Headquarter München
Westendstr. 199, 80686 München

Branch Stuttgart, Location Filderstadt
Gottlieb-Daimler-Str. 7, 70794 Filderstadt

Branch Leipzig, Location Grimma – Gewerbegebiet Grimma Süd
Bahnhofstr. 5, Gebäude 48, 04668 Grimma

Branch Regensburg
Ludwig-Eckert-Str. 8, 93049 Regensburg

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

The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH. https://www.dakks.de/en/content/accredited-bodies-dakks

Abbreviations used: see last page

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

Tests in the fields:

Mechanical-technological and metallographic tests as well as corrosion tests on metallic materials;
scanning electron microscopy on metallic and non-metallic materials;
testing of pipes for gas and drinking water installation;
spark emission spectrometry on low and high alloy steels, aluminum and nickel alloys;

Non-destructive tests (RT, UT, MT, PT, ET, VT, AT) on components and installations;

Examination of Plastics and Organic Materials;

Selected Physical, Physicochemical and Chemical Analyses of Water;

Measurements of wind potential; determination of site quality and determination of the energy yield of Wind Turbines; Performing wind measurements using LiDAR; Evaluation of turbulence intensity; Shadow flicker prognoses and acoustic noise immission prognoses;

Testing of prefabricated accessories for roofing within the scope of Regulation (EU) No. 305/2011, setting forth harmonised conditions for the marketing of construction products (Construction Products Regulation)

The procedures are identified by the following symbols of the sites where they are performed:

F - Filderstadt G - Grimma M - Munich R - Regensburg

Within the accreditation areas marked with *, the testing laboratory is permitted to use the standardized or equivalent test methods listed here with different versions without the prior information and approval of the DAkkS.

The testing laboratory has a current list of all testing procedures in the flexible accreditation area.

-Translation-

1 Mechanical-Technological Tests

1.1 Tensile Tests *

DIN EN ISO 4136 2013-02	Destructive tests on welds in metallic materials - Transverse tensile test	F, G, M
DIN EN ISO 5178 2019-05	Destructive tests on welds in metallic materials - Longitudinal tensile test on weld metal in fusion welded joints	F, G, M
DIN EN ISO 6892-1 2020-06	Metallic materials - Tensile testing - Part 1: Method of test at room temperature; F, M only method B	F, G, M
DIN EN ISO 6892-2 2018-09	Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature F only method B	F, G
DIN EN ISO 14273 2016-11	Resistance welding - Destructive testing of welds - Specimen dimensions and procedure for tensile shear testing resistance spot and embossed projection welds	M
DIN 50162 1978-09	Testing of clad steels; determination of shear strength between cladding metal and parent metal in shear test	G

1.2 Bend and Pressure Tests *

DIN EN ISO 5173 2012-02	Destructive tests on welds in metallic materials - Bend tests	F, G, M
DIN EN ISO 7438 2016-07	Metallic materials - Bend test	G, M
DIN EN ISO 9017 2018-04	Destructive tests on welds in metallic materials - Fracture test	F, G, M
DIN 50106 2016-11	Testing of metallic materials - Compression test at room temperature	M

1.3 Charpy Impact Tests *

DIN EN ISO 148-1 2017-05	Metallic materials - Charpy pendulum impact test - Part 1: Test method	F, G, M

1.4 Pipe Tests *

DIN EN ISO 8491 2004-10	Metallic materials - Tube (in full section) - Bend test	M
DIN EN ISO 8492 2014-03	Metallic materials - Tube - Flattening test	F, G, M
DIN EN ISO 8493 2004-10	Metallic materials - Tube - Drift-expanding test	F, M
DIN EN ISO 8494 2014-03	Metallic materials - Tube - Flanging test	F, M
DIN EN ISO 8495 2014-03	Metallic materials - Tube - Ring-expanding test	F, M
DIN EN ISO 8496 2014-03	Metallic materials - Tube - Ring tensile test	F, G, M

1.5 Hardness Tests *

DIN EN ISO 2639 2003-04	Steels - Determination and verification of the depth of carburized and hardened cases	F, G, M
DIN EN ISO 6506-1 2015-02	Metallic materials - Brinell hardness test – Part 1: Test method F: HBW 2,5/187,5; HBW 2,5/62,5 G: HBW 2,5/187,5; HBW 2,5/62,5 M: HBW2,5/187,5; HBW 2,5/62,5; HBW2,5/31,25	F, G, M
DIN EN ISO 6507-1 2018-07	Metallic materials - Vickers hardness test – Part 1: Test method F: HV 0,5; HV 1; HV 10 G: HV 1; HV 5; HV 10 M: HV 0,5; HV 1; HV 5; HV 10; HV 30	F, G, M

DIN EN ISO 6508-1 2016-12	Metallic materials - Rockwell hardness test – Part 1: Test method G: HRC M: HRC	G, M
DIN EN ISO 9015-1 2011-05	Destructive tests on welds in metallic materials - Hardness testing - Part 1: Hardness test on arc welded joints	F, G, M
DIN EN 10328 2005-04	Iron and steel - Determination of the conventional depth of hardening after surface heating	F, M
DIN 50159-1 2015-01	Metallic materials - Hardness testing with the UCI method - Part 1: Test method	G, M
DIN 50190-3 1979-03	Hardness depth of heat-treated parts; determination of the effective depth of hardening after nitriding	F, G, M
DIN 32525-4 2010-05	Welding consumables - Testing of welding consumables by means of weld metal specimens - Part 4: Test piece for determining the hardness of surfacing	G, M

1.6 Testing of Weld and Solder Joints *

DIN EN 12797 2000-12	Brazing - Destructive tests of brazed joints Clause 6: Metallographic examination	G, M

2 Metallography and Scanning Electron Microscopy Examinations

2.1 Metallography

DIN EN ISO 643* 2020-06	Steels - Micrographic determination of the apparent grain size	F, M
DIN EN ISO 945-1* 2019-10	Microstructure of cast irons – Part 1: Graphite classification by visual analysis	M
DIN EN ISO 3887* 2018-05	Steels - Determination of the depth of decarburization	M

DIN EN ISO 17639* 2013-12	Destructive tests on welds in metallic materials - Macroscopic and microscopic examination of welds	F, G, M
DIN EN 10247* 2017-09	Micrographic examination of the non-metallic inclusion content of steels using standard pictures	M
DIN 50602* 1985-09	Metallographic examination; microscopic examination of special steels using standard diagrams to assess the content of non-metallic inclusions *(withdrawn)*	F
ISO 3057* 1998-03	Non-destructive testing - Metallographic replica techniques of surface examination	G
SEP 1571 Teil 1* 2017-08	Evaluation of inclusions in special steels based on their surface areas - Part 1: Basics	F
SEP 1571 Teil 2* 2017-08	Evaluation of inclusions in special steels based on their surface areas - Part 2: Methods K and M	F
SEP 1571 Teil 3* 2017-08	Evaluation of inclusions in special steels based on their surface areas - Part 3: Method E	F
ASTM E 112-13* 2013	Standard Test Methods for Determining Average Grain Size	F
VGB-S-517-00 2014-11	Guideline for evaluating the structure formation and creep damage of high-temperature steels for high-pressure pipelines and boiler components and their welded joints (Richtreihen zur Bewertung der Gefügeausbildung und Zeitstandschädigung warmfester Stähle für Hochdruckrohrleitungen und Kesselbauteile und deren Schweißverbindungen)	M

2.2 Corrosions Tests *

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	F

2.3 Scanning Electron Microscopy

MUC-WMR-A 004 2020-01	Performance of length measurements using a scanning electron microscope (Durchführung von Längenmessungen mittels Rasterelektronenmikroskop)	M

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DIN ISO 22309* 2015-11	Microbeam analysis - Quantitative analysis using energy-dispersive spectrometry (EDS) for elements with an atomic number of 11 (Na) or above	M

2.4 X-ray fluorescence analysis

MUC-WMR-A 016 2020-10	X-ray fluorescence analysis (XRF analysis) of Al-, Fe-, Ni, Cu-based materials (in German) Röntgenfluoreszensanalyse (RFA) für den stationären und mobilen Einsatz zur quantitativen Bestimmung von Werkstoffen auf AL-, Fe-, Ni, Cu-Basis	M

3 Testing of Pipes for Gas and Drinking Water Installations *

DIN EN 10240 1998-02	Internal and/or external protective coatings for steel tubes - Specification for hot dip galvanized coatings applied in automatic plants	M
DIN EN 10255 2007-07	Non-Alloy steel tubes suitable for welding and threading - Technical delivery conditions	M
DVGW W 534 2015-07	Pipe connectors and pipe joints in drinking water installation *(without 12.6 and 12.7)*	M
DVGW GW 541 2004-10	Stainless steel pipes for gas and drinking water installations – Requirements and tests (Rohre aus nichtrostenden Stählen für Gas- und Trinkwasser-Installation - Anforderungen und Prüfungen)	M

4 Optical Emission Spectrometry on Low- and High-Alloy Steels, Aluminium-, Copper- and Nickel Alloys

MUC-WMR-A008 2020-10	Optical emission spectrometry (OES) to determine 25 elements in steel and iron materials and nickel-based alloys, 18 elements in copper-based alloys and 17 elements in aluminium -based alloys. (Optische Funkenemmissionsspektrometrie (OES) zur Bestimmung von 25 Elementen in Stahl- und Eisenwerkstoffen, in Nickel-Basislegierungen, 18 Elementen in Kupfer-Basislegierungen sowie von 17 Elementen in Aluminium-Basislegierungen.)	M
LEI-A002 2019-10	Spectral analysis of Fe and Ni based alloys with "Spectrolab" spectrometer (Spektralanalyse von Fe- und Ni-Basislegierungen mit Laborspektrometer „Spektrolab“) **-Translation-**	G

5 Nondestructive Testing

5.1 Radiographic Testing (RT) *

DIN EN ISO 5579 2014-04	Non-destructive testing - Radiographic testing of metallic materials using film and X- or gamma rays - Basic rules	F, G, M
DIN EN ISO 10893-6 2019-06	Non-destructive testing of steel tubes - Part 6: Radiographic testing of the weld seam of welded steel tubes for the detection of imperfections	F, G, M
DIN EN ISO 10893-7 2019-06	Non-destructive testing of steel tubes - Part 7: Digital radiographic testing of the weld seam of welded steel tubes for the detection of imperfections Digitalisierte	F, M
DIN EN ISO 17636-1 2013-05	Non-destructive testing of welds - Radiographic testing - Part 1: X- and gamma-ray techniques with film	F, G, M
DIN EN ISO 17636-2 2013-05	Non-destructive testing of welds - Radiographic testing - Part 2: X- and gamma-ray techniques with digital detectors	F, M
DIN EN 12681-1 2018-02	Founding - Radiographic testing - Part 1: Film techniques;	F, M
DIN EN 12681-2 2018-02	Founding - Radiographic testing - Part 2: Techniques with digital detectors	F, M
DIN 25435-7 2014-01	In-service inspections for primary coolant circuit components of light water reactors - Part 7: Radiographic testing	F, M

5.2 Ultrasonic Testing (UT)

DIN EN ISO 10863* 2011-12	Non-destructive testing of welds - Ultrasonic testing - Use of time-of-flight diffraction technique (TOFD)	F, M
DIN EN ISO 13588* 2019-07	Non-destructive testing of welds - Ultrasonic testing - Use of automated phased array technology	F, M

DIN EN ISO 16810* 2014-07	Non-destructive testing - Ultrasonic testing - General principles	F, G, M
DIN EN ISO 16823* 2014-07	Non-destructive testing - Ultrasonic testing - Transmission technique	F, G, M
DIN EN ISO 16826* 2014-06	Non-destructive testing - Ultrasonic testing - Examination for discontinuities perpendicular to the surface	F, M
DIN EN ISO 17640* 2019-02	Non-destructive testing of welds - Ultrasonic testing - Techniques, testing levels, and assessment	F, G, M
Din EN ISO 20601* 2019-04	Non-destructive testing of welds - Ultrasonic testing - Use of automated phased array technology for thin-walled steel components	M
DIN EN ISO 22825* 2018-02	Non-destructive testing of welds - Ultrasonic testing - Testing of welds in austenitic steels and nickel-based alloys	F, M
DIN EN 1802* 2002-09	Transportable gas cylinders - Periodic inspection and testing of seamless aluminium alloy gas cylinders	M
DIN EN 1968* 2005-12	Transportable gas cylinders - Periodic inspection and testing of seamless steel gas cylinders	F, M
DIN EN 3718* 2012-08	Aerospace series - Test method for metallic materials - Ultrasonic inspection of tubes	F, M
DIN EN 10160* 1999-09	Ultrasonic testing of steel flat product of thickness equal to or greater than 6 mm (reflection method)	F, G, M
DIN EN 10228-3* 2016-10	Non-destructive testing of steel forgings - Part 3: Ultrasonic testing of ferritic or martensitic steel forgings	F, G, M
DIN EN 10228-4* 2016-10	Non-destructive testing of steel forgings - Part 4: Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings	F, G, M
DIN EN 10306* 2002-04	Iron and steel - Ultrasonic testing of H beams with parallel flanges and IPE beams	F, M

DIN EN 10307* 2002-03	Non-destructive testing - Ultrasonic testing of austenitic and austenitic-ferritic stainless steels flat products of thickness equal to or greater than 6 mm (reflection method);	F, M
DIN EN 10308* 2002-03	Non-destructive testing - Ultrasonic testing of steel bars	F, G, M
DIN EN 12680-1* 2003-06	Founding - Ultrasonic examination – Part 1: Steel castings for general purposes	F, M
DIN EN 12680-2* 2003-06	Founding - Ultrasonic examination – Part 2: Steel castings for highly stressed components	F, M
DIN EN 12680-3* 2012-02	Founding - Ultrasonic testing – Part 3: Spheroidal graphite cast iron castings	F, M
DIN EN 13100-3* 2005-02	Non-destructive testing of welded joints in thermoplastics semi-finished products - Part 3: Ultrasonic testing	F, M
DIN EN ISO 16809* 2020-02	Non-destructive testing - Ultrasonic thickness measurement;	F, G, M
DIN 25435-1* 2014-01	In-service inspections for primary coolant circuit components of light water reactors - Part 1: Automated ultrasonic testing	M
ISO 4992-1* 2020-03	Steel castings - Ultrasonic examination - Part 1: Steel castings for general purposes	F, M
ISO 4992-2* 2020-03	Steel castings - Ultrasonic examination - Part 2: Steel castings for highly stressed components	F, M
SEP 1915 2005-12	Ultrasonic testing of steel tubes for longitudinal defects *(withdrawn)*	G
SEP 1920* 1984-12	Ultrasonic testing of rolled semi-finished products on internal material discontinuities	G
SEP 1922 1985-07	Ultrasonic testing of ferritic steel castings *(withdrawn)*	G

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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	G
DGZfP US 1 1998-08	Thickness measurement with ultrasound (Dickenmessung mit Ultraschall)	G

5.3 Magnetic Particle Testing (MT) *

DIN EN ISO 9934-1 2017-03	Non-destructive testing - Magnetic particle testing - Part 1: General principles	F, G, M
DIN EN ISO 10893-5 2011-07	Non-destructive testing of steel tubes - Part 5: Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections	F, G, M
DIN EN ISO 17638 2017-03	Non-destructive testing of welds - Magnetic particle testing	F, G, M
DIN EN 1369 2013-01	Founding - Magnetic particle testing	F, G, M
DIN EN 10228-1 2016-10	Non-destructive testing of steel forgings - Part 1: Magnetic particle inspection	F, G, M
ISO 4986 2020-02	Steel castings - Magnetic particle inspection	F, M

5.4 Penetrant Testing (PT) *

DIN EN ISO 3452-1 2014-09	Non-destructive testing - Penetrant testing - Part 1: General principles	F, G, M
DIN EN ISO 3452-5 2009-04	Non-destructive testing - Penetrant testing - Part 5: Penetrant testing at temperatures higher than 50 °C	F, M
DIN EN ISO 3452-6 2009-04	Non-destructive testing - Penetrant testing - Part 6: Penetrant testing at temperatures lower than 10 °C	F, M
DIN EN ISO 10893-4 2011-07	Non-destructive testing of steel tubes - Part 4: Liquid penetrant inspection of seamless and welded steel tubes for the detection of surface imperfections	F, G, M

DIN ISO 4386-3 2020-04	Plain bearings; metallic multilayer plain bearings; non-destructive penetrant testing	G, M
DIN EN 1371-1 2012-02	Founding - Liquid penetrant testing – Part 1: Sand, gravity die and low pressure die castings	F, M
DIN EN 1371-2 2015-04	Founding - Liquid penetrant testing – Part 2: Investment castings	F, M
DIN EN 10228-2 2016-10	Non-destructive testing of steel forgings – Part 2: Penetrant testing	F, G, M
ISO 4386-3 2018-07	Plain bearings - Metallic multilayer plain bearings - Part 3: Non-destructive penetrant testing	G, M

5.5 Eddy Current Testing (ET) *

DIN EN ISO 2360 2017-12	Non-conductive coatings on non-magnetic electrically conductive base metals - Measurement of coating thickness - Amplitude-sensitive eddy-current method	F, M
DIN EN ISO 15549 2019-10	Non-destructive testing - Eddy current testing - General principles	F, M
DIN EN ISO 17643 2015-12	Non-destructive testing of welds - Eddy current examination of welds by complex plane analysis	F, M
DIN EN 1971-1 2020-02	Copper and copper alloys - Eddy current test for measuring defects on seamless round copper and copper alloy tubes - Part 1: Test with an encircling test coil on the outer surface	M
DIN EN 1971-2 2020-02	Copper and copper alloys - Eddy current test for measuring defects on seamless round copper and copper alloy tubes - Part 2: Test with an internal probe on the inner surface	M
DIN 25435-6 2014-01	In-service inspections for primary coolant circuit components of light water reactors - Part 6: Eddy current testing of steam generator heating tubes	F, M
DKI WP 781 2008-03	Eddy current testing of round condenser and heat exchanger tubes of copper and wrought copper alloys	F, M
DKI WP 801 2008-03	Eddy-current testing of the tightness of rolled, finned tubes made from copper and wrought copper alloys according to EN 12452 and VdTÜV material specification 420.	F, M

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DKI WP 821 2008-03	Eddy-current testing of oval tubes made from copper and wrought copper alloys.	F, M

5.6 Visual Testing (VT) *

DIN EN 13100-1 2017-08	Non destructive testing of welded joints of thermoplastics semi-finished products - Part 1: Visual examination	M
DIN EN ISO 17637 2017-04	Non-destructive testing of welds - Visual testing of fusion-welded joints	F, G, M
DIN EN 13018 2016-06	Non-destructive testing - Visual testing - General principles	F, M
DIN 25435-4 2014-01	In-service inspections for primary collant circuit components of light water reactors - Part 4: Visual testing	F, M

5.7 Acoustic Emission Testing (AT) *

DIN EN 14584 2013-07	Non-destructive testing - Acoustic emission testing - Examination of metallic pressure equipment during proof testing - Planar location of AE sources	M
DIN EN 15495 2008-02	Non-destructive testing - Acoustic emission - Examination of metallic pressure equipment during proof testing - Zone location of AE sources	M

5.8 General Non-Destructive Testing Methods *

DIN EN ISO 17635 2017-04	Non-destructive testing of welds - General rules for metallic materials	F, G, M
DIN EN 12799 2000-12	Brazing - Non-destructive examination of brazed joints	F, G, M
DIN EN 13445-5 2018-12	Unfired pressure vessels - Part 5: Inspection and testing	F, M

DIN EN 13480-5 2017-12	Metallic industrial piping - Part 5: Inspection and testing	M
DIN 25435-2 2014-01	In-service inspections for primary coolant circuit components of light water reactors – Part 2: Magnetic particle and penetrant testing	F, M
AD 2000-Merkblatt HP 5/3 2015-04	Manufacture and testing of joints - Non-destructive testing of welded joints	F, G, M
AD 2000-Merkblatt HP 5/3 Anlage 1 2015-04	Non-destructive testing of welded joints - Minimum requirements for non-destructive testing methods	F, G, M
KTA 3201.1 2017-11	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Components of the reactor coolant pressure boundary of light water reactors - Part 1: Materials and product forms Annex B: Performance of manual ultrasonic examinations Annex C: Performance of surface examination by magnetic particle and liquid penetrant methods	F, M
KTA 3201.3 2017-11	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Components of the Reactor Coolant Pressure Boundary of Light Water Reactors Part 3: Manufacture Annex C: Performance of manual ultrasonic examinations Annex D: Performance of manual ultrasonic angled pitch-catch examinations Annex E: Performance of surface examination by magnetic particle and liquid penetrant methods	F, M
KTA 3201.4 2016-11	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Components of the reactor coolant pressure boundary of light water reactors - Part 4: Inservice inspections and operational monitoring	F, M
KTA 3204 2017-11	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Reactor pressure vessel internals Chapter 8.9: Requirements for non-destructive testing and evaluation od test results	F, M

KTA 3211.1 2017-11	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Pressure and activity retaining components of systems outside the primary circuit – Part 1: Materials Annex D: Performance of manual ultrasonic examinations Annex E: Performance of surface examination by magnetic particle and liquid penetrant methods	F, M
KTA 3211.3 2017-11	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Pressure and Activity Retaining Components of Systems Outside the Primary Circuit – Part 3: Manufacture Annex D: Performance of manual ultrasonic examinations Annex E: Performance of surface examination by magnetic particle and liquid penetrant methods	F, M
KTA 3211.4 2017-11	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Pressure and Activity Retaining Components of Systems Outside the Primary Circuity – Part 4: Inservice Inspections and Operational Monitoring	F, M
KTA 3401.4 2017-11	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Reactor containments of steel – Part 4: Inservice inspections	F, M
KTA 3903 2012-11 Amendment 2013-05	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Inspection, Testing and Operation of Lifting Equipment in Nuclear Power Plants Annex B: Non-destructive testing	F, G, M
KTA 3905 2012-11 Amendment 2013-05	Safety Standards of the Nuclear Safety Standards Commission (KTA) - Load Attaching Points on Loads in Nuclear Power Plants Annex B: Non-destructive testing	F, G, M
SEP 1914 1983-08	Non-destructive testing of fusion-welded seams in pipes of stainless steels	G
SEP 1916 1989-12	Non-destructive testing of fusion welded ferritic steel tubes	G
SEP 1917 1994-09	Nondestructive testing of resistance welded pipes of ferritic steels	G
DVGW GW 350 2015-06	Welding Joints of Steel Pipelines for Gas and Water Supply - Manufacturing, Testing and Evaluation **-Translation-**	F, G, M

6 Examination of Plastic Materials and Organic Materials

6.1 Thermic Tests at Plastic Materials *

DIN EN ISO 75-1 2020-06	Plastics - Determination of temperature of deflection under load - Part 1: General test method	M
DIN EN ISO 306 2014-03	Plastics - Thermoplastic materials - Determination of Vicat softening temperature (VST)	M
DIN EN ISO 1133-1 2012-03	Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics – Part 1: Standard method	M
DIN EN ISO 1133-2 2012-03	Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 2: Method for materials sensitive to time-temperature history and/or moisture	M
DIN EN ISO 11357-2 2020-08	Plastics - Differential scanning calorimetry (DSC) – Part 2: Determination of glass transition temperature and glass transition step height	M
DIN EN ISO 11357-3 2018-07	Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization	M
DIN EN ISO 11357-6 2018-07	Plastics - Differential scanning calorimetry (DSC) - Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)	M
DIN EN 728 1997-03	Plastics piping and ducting systems - Polyolefin pipes and fittings - Determination of oxidation induction time *(withdrawn)*	M
DIN 51007 2019-04	Thermal analysis - Differential thermal analysis (DTA) and differential scanning calorimetry (DSC) - General Principles	M
DIN 53497 2017-04	Testing of plastics - Hot storage test on mouldings made of thermoplastic moulding materials without external mechanical stressing	M

6.2 Other material tests on plastic materials *

DIN EN ISO 178 2019-08	Plastics - Determination of flexural properties	M
DIN EN ISO 179-1 2010-11	Plastics - Determination of Charpy impact properties - Part 1: Non-instrumented impact test	M
DIN EN ISO 527-2 2012-06	Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics	M
DIN EN ISO 527-3 2019-02	Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets	M
DIN EN ISO 1183-1 2019-09	Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pyknometer method and titration method *(only 5.1)*	M
BS 1970 2012-12	Hot water bottles manufactured from rubber and PVC – Specification *(only 4,5, 6.1-6.3, 6.4.3, 6.5.2-6.5.3, 6.6, 7)*	M

6.3 Testing of Piping, Fittings and Sheets Made from Thermoplastics *

DIN EN ISO 1167-1 2006-05	Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 1: General method	M
DIN EN ISO 1167-2 2006-05	Thermoplastics pipes, fittings and assemblies for the conveyance of fluids - Determination of the resistance to internal pressure - Part 2: Preparation of pipe test pieces	M
DIN EN ISO 10931 2015-11	Plastics piping systems for industrial applications - Poly(vinylidene fluoride) (PVDF) - Specifications for components and the system	M
DIN EN 12201-2 2013-12	Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 2: Pipes	M
DIN EN 12201-3 2013-01	Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 3: Fittings	M

DIN EN 12666-1 2011-11	Plastics piping systems for non-pressure underground drainage and sewerage - Polyethylene (PE) - Part 1: Specifications for pipes, fittings and the system	M
DIN 8061 2016-05	Unplasticized polyvinyl chloride (PVC-U) pipes - General quality requirements, testing	M
DIN 8075 2018-08	Polyethylene (PE) pipes - PE 80, PE 100 - General quality requirements, testing	M
DIN 8078 2008-09	Polypropylene (PP) pipes - PP-H, PP-B, PP-R, PP-RCT - General quality requirements and testing	M
DIN 8080 2009-10	Chlorinated polyvinyl chloride (PVC-C) pipes - General quality requirements, testing	M
DIN 16961-1 2018-08	Thermoplastics pipes and fittings with profiled wall and smooth pipe inside - Part 1: Classification and dimensions	M
DIN 16961-2 2018-04	Thermoplastics pipes and fittings with profiled wall and smooth pipe inside - Part 2: Technical delivery specifications *(without 5.4)*	M
DIN 19537-3 1990-11	Prefabricated high density polyethylene (PE-HD) manholes for use in sewerage systems; dimensions and technical delivery conditions *(withdrawn)*	M
DVGW GW 335-A1 2003-06	Plastic piping systems in gas and water distribution; requirements and testing - Part A 1: PVC-U pipes and fittings made therefrom for water distribution; including corr. 2006-06	M
DVGW GW 335-A2 2005-11	Plastic piping systems in gas and water distribution; requirements and testing - Part A2: PE 80 and PE 100 pipes, incl. corr. 2008-02 and supplement 1, 2010-12	M
DVGW GW 335-A5 2015-12	Plastic piping systems in gas- and water distribution; requirements and testing - Part A 5: PE multilayer pipes with reinforcement (PE stretched) and associated fittings and joints	M

DVGW GW 335-A6 2015-12	Plastic piping systems in gas- and water distribution; requirements and testing - Part A 6: PA-U 160 and PA-U 180 pipes and associated fittings and joints *(sub-clauses 3.2-3.4, 3.6-3.7, 3.13-3.17, 3.19-3.21, 3.23, 3.26 only)*	M
DVGW GW 335-B2 2004-09	Plastic piping systems in gas- and water distribution; requirements and testing - Part B2: PE 80 and PE 100 fittings; incl. supplement 1, 2013-02	M
DVGW W 544 2007-05	Plastic pipes in drinking water installations	M
DBS 918064 2013-12	Technical delivery conditions - Plastic pipes and plastic shafts for the drainage of railway systems *(without Ziffer 2.3.2 and 2.3.6)*	M

6.4 Testing of Joints between Plastics *

DIN EN 12814-1 1999-12	Testing of welded joints of thermoplastics semi-finished products - Part 1: Bend test	M
DIN EN 12814-2 2000-03	Testing of welded joints of thermoplastics semi-finished products - Part 2: Tensile test	M
DIN EN 12814-4 2018-08	Testing of welded joints of thermoplastics semi-finished products - Part 4: Peel test	M

7 Selected Physical, Physicochemical and Chemical Analyses of Water

7.1 Sample taking

MUC-CPW-A 130 2019-12	Sampling and physical monitoring of water and steam circuits	M

7.2 Physical Processes, Physical and Physicochemical Parameters *

DIN EN ISO 10523 (C5) 2012-04	Water quality - Determination of pH	M
DIN EN 27888 (C8) 1993-11	Water quality; determination of electrical conductivity	M
DIN 38404-4 (C4) 1976-12 Amendment 1 2018-12	German Standard Methods for Analysing of Water, Waste Water and Sludge; Physical and Physical-chemical Parameters (Group C); Determination of Temperature	M
DIN 38404-6 (C6) 1984-05 Amendment 1 2018-12	German standard methods for the examination of water, waste water and sludge; physical and physico-chemical parameters (group C); determination of the oxidation reduction (redox) potential	M

7.3 Anions

DIN 38405-1 (D1)* 1985-12	German standard methods for the examination of water, waste water and sludge; anions (group D); determination of chloride ions	M
MUC-CPW-A125 2019-09	Determination of the concentration of free carbon dioxide in water using titration (Titrimetrische Bestimmung der Konzentration an freiem Kohlenstoffdioxid in Wasser)	M
QMA-Nr. MUC-CPW-A126 2019-09	Determination of the sodium sulphite concentration in water using titration (Titrimetrische Bestimmung der Natriumsulfitkonzentration in Wasser)	M

7.4 Cations

DIN 38406-3 (E3)* 2002-03	German standard methods for the examination of water, waste water and sludge - Cations (group E) - Part 3: Determination of calcium and magnesium, complexometric method	M
MUC-CPW-A106 2019-09	Determination of the sodium concentration using a sodium monitor (Bestimmung der Natriumkonzentration mittels Natriummonitor)	M

7.5 Gaseous Components

DIN EN ISO 5814 (G22)* 2013-02	Water quality - Determination of dissolved oxygen - Electrochemical probe method	M
DIN EN ISO 7393-2 (G4-2)* 2019-03	Water quality - Determination of free chlorine and total chlorine - Part 2: Colorimetric method using N,N-dialkyl-1,4-phenylenediamine, for routine control purposes	M
DIN ISO 17289* 2014-12	Water quality - Determination of dissolved oxygen - Optical sensor method	M
MUC-CPW-A 107 2019-09	Determination of the oxygen concentration of water using a rapid test	M

7.6 Summary of Impact and Material Parameters *

DIN EN ISO 9963-1 (C23) 1996-02	Water quality - Determination of alkalinity - Part 1: Determination of total and composite alkalinity	M
DIN 38409-7 (H7) 2005-12	German standard methods for the examination of water, waste water and sludge - Parameters characterizing effects and substances (group H) - Part 7: Determination of acid and base-neutralizing capacities	M
MUC-CPW-A122 2019-12	Determination of permanganate consumption	M

7.7 Single Components *

DIN 38413-1 (P 1) 1982-03	German standard methods for the analysis of water, waste water and sludge; Individual components (Group P); Determination of hydrazine	M

7.8 Selected Quick Tests for Water Analysis Using Ready-To-Use Reagents

Hach Aluminon Method (Method 8012) 2018-01	Evaluation of Aluminon (Measuring range: 0,008 to 0,8 mg/l Al)	M
Hach Mercaptoacetic Acid Method (Method 8036) 2019-08	Evaluation of Molybdenum (Measuring range: 0,2 to 40,0 mg/l Mo	M
Hach Mercuric Thiocyanate Method (Method 8113) 2018-02	Evaluation of Chloride (Measuring range: 0,1 to 25,0 mg/l Cl^-)	M
Hach Molybdovanadate Method (Method 8114) 2019-08	Evaluation of Phosphorus (Measuring range: 0,3 to 45,0 mg/l PO_4^{3-})	M
Hach Porphyrin Method (Method 8143) 2014-01	Evaluation of Copper (Measuring range: 1 to 210 µg/l Cu)	M
Hach FerroZine Method (Method 8147) 2014-01	Evaluation of Iron (Measuring range: 0,009 to 1,4 mg/l Fe)	M
Hach Silicomolybdate Method (Method 8185) 2014-01	Evaluation of Silica (Measuring range: 1 to 100 mg/l SiO_2)	M
Hach Heteropoly Blue Method (Method 8186) 2014-01	Evaluation of Silica (Measuring range: 0,01 to 1,6 mg/l SiO_2)	M

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8 Measurements and investigations of the wind potential and determination of the energy yield

8.1 Performing wind measurements using LiDAR

AAWSC-001 Rev. 12 2019-10	Measurement of wind potential with meteorological measuring devices	R
IEC 61400-12-1* 2017-03	Wind energy generation systems - Part 12-1: Power performance measurements of electricity producing wind turbines	R
FGW TR 6, Rev. 10* 2017-10	Assessment of wind potential and energy yield	R

8.2 Site-specific assessment of wind potential and energy yield; Assessment of the site quality

AAWSC-002 Rev. 11 2019-10	Measurement of wind potential with meteorological measuring devices	R
FGW TR5 Rev. 7* 2017-01	Assessment and application of des reference yields	R
FGW TR6 Rev. 10* 2017-10	Assessment of wind potential and energy yield	R
IEC 61400-12-1* 2017-03	Wind energy generation systems - Part 12-1: Power performance measurements of electricity producing wind turbines, 2nd edition in conjunction with: *Gesetz zur Neuregelung des Rechts der Erneuerbaren Energien im Stromrecht (EEG 2017)*	R

8.3 Evaluation of ambient, characteristic and effective turbulence intensity and calculation of extreme winds

AAWSC-004 Rev. 05 2019-09	Assessment of the characteristic, representative and induced turbulence of the suitability for the location and the extreme winds	R
FGW TR6 Rev. 10* 2017-09	Assessment of wind potential and energy yield	R
DIBt-Richtlinie 2015-03	Guideline Wind turbines: Actions and stability checks for tower and foundations	R
DIN EN IEC 61400-1* 2019-12 IEC 61400-1 2019-02	Wind energy generation system – Part 1: Design requirements	R

8.4 Shadow flicker prognoses and acoustic noise immission prognoses

AAWSC-006 Rev. 06 2019-10	Shadow flicker prognoses and acoustic noise prognoses	R
AAWSC-007 Rev. 07 2019-10	Acoustic noise immission prognoses	R
LAI 2002-03	Information on the determination and assessment of the optical immissions of wind turbines (WEA - Schattenwurf - Hints) Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen (WEA – Schattenwurf – Hinweise)	R
LAI 2016-06	Information on sound immission protection in wind turbines (WKA), with changes Hinweise zum Schallimmissionsschutz bei Windkraftanlagen (WKA), mit Änderungen	R
DIN ISO 9613-2* 1999-10	Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation	R

9 Testing of pipes made from unalloyed steel and testing of prefabricated accessories for roofing within the scope of Regulation (EU) No. 305/2011 setting forth harmonised conditions for the marketing of construction products (Construction Products Regulation) *

EU Commission Decision	System[1)]	Technical specification	Location
1998/436/EC Roof coverings, skylights, roof windows and ancillary products	3	**EN 516:2006** Prefabricated accessories for roofing - Installations for roof access - Walkways, treads and steps;	**M**
		EN 517:2006 Prefabricated accessories for roofing - Roof safety hooks	**M**

[1)] System for evaluating and checking performance consistency

The requirements for a testing laboratory set forth in Article 43 of the Construction Product Regulation are fulfilled.

Abbreviations used:

AAWSC	QM-procedure of TÜV SÜD Industrie Service GmbH, Wind Cert Services
AD	Arbeitsgemeinschaft Druckbehälter
ASTM	American Society for Testing and Materials
BS	British Standard
DBS	procedure of Deutsche Bahn AG
DGZfP	Deutsche Gesellschaft für Zerstörungsfreie Prüfungen
DIBt	Deutsches Institut für Bautechnik
DIN	Deutsches Institut für Normung e.V.
DKI	Deutsches Kupferinstitut
DVGW	Deutscher Verein des Gas- und Wasserfaches
DVS	Deutscher Verband für Schweißen und verwandte Verfahren e. V.
EN	Europäische Norm
FGW TR	FGE e.V. – Fördergesellschaft Windenergie und anere dezentrale Energien, Technische Richtlinien
IEC	International Electrotechnical Cimission
ISO	International Organization for Standardization
KTA	Kerntechnischer Ausschuss
LAI	Länderarbeitsgemeinschaft für Immissionsschutz
LEI-Y000	Procedure of TÜV SÜD Industrie Service GmbH
MUC-XXX-Y000	Procedure of TÜV SÜD Industrie Service GmbH
QMA	Hausverfahren der TÜV SÜD Industrie Service GmbH
SEP	Stahl-Eisen-Prüfblatt
VdTÜV	Verband der Technischen Überwachungs-Vereine
VGB	Vereinigung der Großkesselbesitzer neu VG Power Tech e.V.

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