

## Deutsche Akkreditierungsstelle GmbH

### Annex to the Accreditation Certificate D-PL-18511-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 17.11.2014 to 19.03.2018

Date of issue: 27.01.2015

Holder of certificate:

**TÜV Rheinland Werkstoffprüfung GmbH**

with its sites

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Am Grauen Stein, 51105 Köln  
Lessingstraße 79 / Halle B1j, 13158 Berlin  
Am Klinikum 7, 02828 Görlitz**

Tests in the fields:

**manual non-destructive testing methods (radiographic testing, ultrasonic testing, eddy current testing, magnetic particle testing, liquid penetrant testing, leak testing, acoustic emission testing, visual testing), mechanized ultrasonic testing, strain gauge analysis and mobile hardness testing of metallic materials in metalproducing and metalworking industry as well as in mechanical engineering and plant technology;  
corrosion testing, mechanical testing, metallographic and microstructure replica analysis of metallic materials; mechanical testing of polymers;  
determination of inorganic fibrous particles**

Abbreviations used: see last page

**The laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use standard test methods listed here with different issue dates or revision status updates.**

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

Berlin = B      Görlitz = G      Köln = K      Peitz = P

**Non-destructive testing**

**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	B, G, K, P
DIN EN ISO 17636-1 2013-05	Non-destructive testing of welds - Radiographic testing - Part 1: X- and gamma-ray techniques with film	B, G, K, P
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, G, K, P
DIN EN 12681 2003-06	Founding - Radiographic examination	B, G, K, P
DVGW-GW 350 2006-10	Welding joints of steel pipelines for gas and water supply - manufacturing, testing and evaluation	B, G, K, P

**each in connection with:**

<i>DIN EN ISO 11699-2 2012-01</i>	<i>Non-destructive testing - Industrial radiographic films - Part 2: Control of film processing by means of reference values</i>
<i>DIN EN ISO 6520-1 2007-11</i>	<i>Welding and allied processes - Classification of geometric imperfections in metallic materials - Part 1: Fusion welding</i>
<i>DIN EN ISO 10675-1 2013-12</i>	<i>Non-destructive testing of welds - Acceptance levels for radiographic testing - Part 1: Steel, nickel, titanium and their alloys</i>
<i>DIN EN 25580 1992-06</i>	<i>Non-destructive testing - industrial radiographic illuminators - minimum requirements</i>

*DIN EN ISO 5817  
2014-06*

*Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfection*

*DIN EN ISO 10042  
2006-02*

*Welding - Arc-welded joints in aluminium and its alloys - Quality levels for imperfections*

**Ultrasonic testing**

DIN EN ISO 16810 2014-07	Non-destructive testing - Ultrasonic testing - General principles	B, G, K, P
DIN EN ISO 17640 2011-04	Non-destructive testing of welds - Ultrasonic testing - Techniques, testing levels, and assessment	B, G, K, P
DIN 54123 1980-10	Non-destructive Test - Ultrasonic Method of Testing Claddings, Produced by Welding, Rolling and Explosion	B, G, K, P
SEL 072 1977-12	Ultrasonically tested heavy plate - technical delivery specifications ( <i>withdrawn document</i> )	B, G, K, P
DIN EN 10160 1999-09	Ultrasonic testing of steel flat product of thickness equal to or greater than 6 mm (reflection method)	B, G, K, P
SEP 1915 1994-09	Ultrasonic testing of steel pipes for aberration ( <i>withdrawn document</i> )	B, G, K, P
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, G, K, P
SEP 1916 1989-12	Non-destructive testing, fusion-welded ferritic steel tubes	B, G, K, P
SEP 1918 1992-01	Ultrasonic testing of steel tubes for the detection of transverse imperfections ( <i>withdrawn document</i> )	B, G, K, P

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SEP 1919 1977-06	Ultrasonic testing for laminations of pipes of creep-resistant steels <i>(withdrawn document)</i>	B, G, K, P
DIN EN ISO 10893-8 2011-07	Non-destructive testing of steel tubes - Part 8: Automated ultrasonic testing of seamless and welded steel tubes for the detection of laminar imperfections	B, G, K, P
SEP 1920 1984-12	Ultrasonic testing of rolled semi-finished products on internal material discontinuities	B, G, K, P
SEP 1922 1985-07	Ultrasonic testing of forgings of ferritic steel <i>(withdrawn document)</i>	B, G, K, P
DIN EN 12680-1 2003-06	Founding - Ultrasonic examination - Part 1: Steel castings for general purposes	B, G, K, P
SEP 1924 1989-10	Ultrasonic testing of castings of cast iron with nodular <i>(withdrawn document)</i>	B, G, K, P
DIN EN 12680-3 2012-02	Founding - Ultrasonic testing - Part 3: Spheroidal graphite cast iron castings	B, G, K, P
DIN EN 10228-3 1998-07	Non-destructive testing of steel forgings - Part 3: Ultrasonic testing of ferritic or martensitic steel forgings	B, G, K, P
DIN ISO 10228-4 1999-10	Non-destructive testing of steel forgings - Part 4: Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings	K

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DIN ISO 4386-1  
1992-11 Plain bearings - metallic multilayer plain bearings - non-destructive ultrasonic testing of bond B, G, K, P

**each in connection with:**

*DIN EN ISO 11666  
2011-04 Non-destructive testing of welds -  
Ultrasonic testing - Acceptance levels*

*DIN EN ISO 23279  
2010-08 Non-destructive testing of welds - Ultra-  
sonic testing - Characterization of  
indications in welds*

**Magnetic particle testing**

DIN EN ISO 9934-1  
2002-03 Non-destructive testing - Magnetic particle testing - Part 1:  
General principles B, G, K, P

DIN EN ISO 17638  
2010-03 Non-destructive testing of welds - Magnetic particle testing B, G, K, P

SEP 1935  
1982-06 Seam testing of castings of steel - magnetic powder test  
(*withdrawn document*) B, G, K, P

DIN EN 1369  
2013-01 Founding - Magnetic particle testing B, G, K, P

**each in connection with:**

*DIN EN ISO 23278  
2010-03 Non-destructive testing of welds - Magnetic  
particle testing of welds - Acceptance levels*

*DIN EN 1559-2  
2000-04 Founding - Technical conditions of delivery -  
Part 2: Additional requirements for steel  
castings*

**Liquid penetrant testing**

DIN EN ISO 3452-1  
2014-09 Non-destructive testing - Penetrant testing - Part 1: General  
principles B, G, K, P

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SEP 1936 1982-06	Seam testing of castings of steel - penetration testing <i>(withdrawn document)</i>	B, G, K, P
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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, G, K, P
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DIN EN 1371-2 1998-07	Founding - Liquid penetrant inspection - Part 2: Investment castings	B, G, K, P
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**each in connection with:**

<i>DIN EN ISO 23277 2010-03</i>	<i>Non-destructive testing of welds - Penetrant testing of welds - Acceptance levels</i>
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**Leak testing**

DIN EN 1593 1999-11	Non-destructive testing - Leak testing - Bubble emission techniques	K
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**in connection with:**

<i>DIN EN 1779 1999-10 correction 1 2005-02</i>	<i>Non-destructive testing - Leak testing - Criteria for the method and technique selection</i>
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**Visual testing**

DIN EN ISO 17637 2011-05	Non-destructive testing of welds - Visual testing of fusion-welded joints	B, G, K, P
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**Acoustic emission testing**

DIN EN 14584 2005-11	Non-destructive testing - Acoustic emission - Examination of metallic pressure equipment during proof testing - Planar location of AE sources	K
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VdTÜV-MB 369 2001-05	Guideline of acoustic emission tests at gas pressure testing on pressure vessels of gas tanks	K
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VdTÜV-MB 375 2008-07	Guideline of acoustic emission tests at gas pressure testing on gas tanks for compressed natural gas (CNG) in filling plants	K
DIN EN 13554 2011-04	Non-destructive testing - Acoustic emission testing - General principles	K
ISO 16148 2006-05	Gas cylinders - Refillable seamless steel gas cylinders - Acoustic emission testing (AT) for periodic inspection	K
TRBS 1201 2012-08	Technical Rules of operating safety - Tests on work equipment and tools requiring surveillance	K
ASME BPVC Sect. 5 2013	ASME Boiler & Pressure Vessel Code - Section 5: Nondestructive Examination (here: <i>Acoustic emission testing</i> )	K

**in connection with:**

*DGZfP - SE 3  
1991-09*

*Guideline for the characterization of the test equipment for acoustic emission*

DIN EN 15856 2010-05	Non-destructive testing - Acoustic emission - General principles of AE testing for the detection of corrosion within metallic surrounding filled with liquid	K
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**Eddy current testing**

DIN EN 1711 2000-03	Non-destructive examination of welds - Eddy current examination of welds by complex plane analysis	B, G, K, P
DIN EN ISO 2360 2004-04	Non-conductive coatings on non-magnetic electrically conductive basis materials - Measurement of coating thickness - Amplitude-sensitive eddy current method	B, G, K, P
DIN 54141-1 1982-10	Non-destructive testing - Eddy current testing of pipes and tubes - General remarks on testing using concentric test coils and the single-frequency method	B, G, K, P
DIN 54141-2 1982-10	Non-destructive testing - Eddy current testing of pipes and tubes - Reference method for the determination and calibration of the properties of an eddy current testing system using concentric test coils	B, G, K, P

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DIN 54141-3 1987-02	Non-destructive testing - eddy current testing of pipes and tubes - procedure	B, G, K, P
DIN EN ISO 10893-1 2011-07	Non-destructive testing of steel tubes - Part 1: Automated electromagnetic testing of seamless and welded (except submerged arc-welded) steel tubes for the verification of hydraulic leaktightness	B, G, K, P
DIN EN ISO 10893-2 2011-07	Non-destructive testing of steel tubes - Part 2: Automated eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of imperfections	B, G, K, P
DIN EN ISO 2178 1995-04	Non-magnetic coatings on magnetic substrates - Measurement of coating thickness - Magnetic method	B, G, K, P
SEP 1914 1983-08	Non-destructive testing of fusion-welded seams in pipes of stainless steels	B, G, K, P
SEP 1917 1994-09	Nondestructive testing of resistance welded pipes of ferritic steels	B, G, K, P
SEP 1925 1980-01	Electromagnetic testing of pipes for the proof of impermeability	B, G, K, P
ASTM E 309 2011-01	Standard Practice for Eddy-Current Examination of Steel Tubular Products Using Magnetic Saturation	B, G, K, P
ASTM E 426 2012-01	Standard Practice for Electromagnetic (Eddy-Current) Examination of Seamless and Welded Tubular Products, Titanium, Austenitic Stainless Steel and Similar Alloys	B, G, K, P

**in connection with:**

*DIN EN ISO 15549  
2011-03*

*non-destructive testing - Eddy current  
testing - General principles*

**Methods cross standards for NDT**

DIN EN ISO 17635 2010-08	Non-destructive testing of welds - General rules for metallic materials	B, G, K, P
AD 2000 HP 5/3 2011-05	Manufacture and testing of joints - Non-destructive testing of welded joints	B, G, K, P



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AD 2000 HP 5/3 Annex 1 2002-01	Non-destructive testing of welded joints - Minimum requirements for non-destructive testing methods	B, G, K, P
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**Structural mechanical tests**

**Tensile tests and creep testing in tension**

DIN EN ISO 4136 2011-05	Destructive tests on welds in metallic materials - Transverse tensile test	K
DIN EN ISO 9017 2013-12	Destructive tests on welds in metallic materials - Fracture test	K
DIN EN ISO 6892-1 2009-12	Metallic materials - Tensile testing - Part 1: Method of test at room temperature (here: <i>method B</i> )	K
DIN EN ISO 6892-2 2011-05	Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature (here: <i>method B</i> )	K
DIN EN ISO 204 2009-10	Metallic materials - Uniaxial creep testing in tension - Method of test	K
DIN EN ISO 5178 2011-05	Destructive tests on welds in metallic materials - Longitudinal tensile test on weld metal in fusion welded joints	K

**in connection with:**

*DIN EN 10164  
2005-03*

*Steel products with improved deformation properties perpendicular to the surface of the product - Technical delivery conditions*

**Impact and bending tests**

DIN EN ISO 9016 2011-05	Destructive tests on welds in metallic materials - Impact tests - Test specimen location, notch orientation and examination	K
DIN EN ISO 5173 2012-01	Destructive tests on welds in metallic materials - Bend tests	K

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DIN EN ISO 148-1  
2011-01                      Metallic materials - Charpy pendulum impact test - Part 1: Test method                      K

**in connection with:**

*DIN EN ISO 148-1  
Annex 1  
2014-02                      Metallic materials - Charpy pendulum impact test - Part 1: Test method - Supplement 1: Special test pieces*

DIN EN ISO 7438  
2012-03                      Metallic materials - Bend test                      K

DIN 50115  
1991-04                      Notched bar impact testing of metallic materials using test pieces other than ISO test pieces                      K

**Strain measurements**

VDI/VDE/GESA 2635  
Sheet 2  
2004-01                      Experimental structural analysis - Recommended practice for high-temperature strain measurements                      K

VdTÜV-Merkblatt 803  
2008-10                      Guidelines for the execution and evaluation of elongation measurements by wire strain gauges (DMS)                      K

**in connection with:**

*VDI/VDE/GESA 2635  
Sheet 1  
2007-04                      Experimental structure analysis - Metallic bonded resistance strain gages - Characteristics and testing conditions*

*AD 2000-Merkblatt S4  
2000-10                      Evaluation of stresses determined by way of calculation and experimental stress analysis*

**Hardness tests**

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 6506-1  
2006-03                      Metallic materials - Brinell hardness test - Part 1: Test method                      K

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DIN EN ISO 6507-1 2006-03	Metallic materials - Vickers hardness test - Part 1: Test method	K
DIN EN ISO 6508-1 2006-03	Metallic materials - Rockwell hardness test - Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)	K
DIN EN ISO 2639 2003-04	Steels - Determination and verification of the depth of carburized and hardened cases	K
DIN EN 10328 2005-04	Iron and steel - Determination of the conventional depth of hardening after surface heating	K
DIN 50190-3 1979-03	Hardness depth of heat-treated parts - determination of the effective depth of hardening after nitriding	K
DIN EN 1043-1 1996-02	Destructive test on welds in metallic materials - Hardness testing - Part 1: Hardness test on arc welded joints <i>(zurückgezogene Norm)</i>	K
DIN 50159-1 2008-10	Metallic materials - Hardness testing with the UCI method - Part 1: Test method	K
DIN 50159-2 2008-10	Metallic materials - Hardness testing with the UCI method - Part 2: Verification and calibration of the testing devices	K
<b>Corrosion tests</b>		
DIN EN ISO 9227 2012-09	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

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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 2005-09	Paints and varnishes - Determination of resistance to humidity - Part 2: Procedure for exposing test specimens in condensation-water atmospheres	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 2013-01	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 2014-01	Standard Test Methods for Detecting Detrimental Intermetallic Phase in Duplex Austenitic/Ferritic Stainless Steels	K
ASTM G 48 2011-01	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 2002-01	Standard Test Methods of Detecting Susceptibility to Intergranular Corrosion in Wrought, Nickel-Rich, Chromium-Bearing Alloys	K
VDA-Blatt 621-415 1982-02	Testing of corrosion protection of motorcar coatings at cyclic load	K
SEP 1877 1994-07	Test of the resistance of high-alloy, corrosion-proof materials against intercrystalline corrosion	K
Stamicarbon 2009-Rev. L 2009-01	Sampling, Huey-test and microscopic examination of corrosion resistant steels according to the specification 18005 material designation BC.01 and BC.05	K

**Metallographic analysis**

DIN 50600 1980-03	Testing of metallic materials - Metallographic Micrographs - Picture scales and formats	K
DIN 50602 1985-09	Metallographic examination - microscopic examination of special steels using standard diagrams to assess the content of non- metallic inclusions <i>(withdrawn standard)</i>	K
DIN EN 10247 2007-07	Micrographic examination of the non-metallic inclusion content of steels using standard pictures	K
	<b>in connection with:</b>	
	<i>DIN EN ISO 5817 2006-10</i>	<i>Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections</i>
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
ISO 4967 2013-07	Steel - Determination of content of nonmetallic inclusions - Micrographic method using standard diagrams	K
DIN 54150 1977-08	Non-destructive testing - impression methods for surface examination (Replica-technique)	K
DIN EN ISO 945-1 2010-09	Microstructure of cast irons - Part 1: Graphite classification by visual analysis	K
	<b>in connection with:</b>	
	<i>DIN EN ISO 6520-1 2007-11</i>	<i>Welding and allied processes - Classification of geometric imperfections in metallic materials - Part 1: Fusion welding</i>
ASTM E 562 2011-01	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count	K

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AVS 63A/000 1981-03	Determination of the content of delta ferrit in austenitic steel with ferritic segregation	K
VGB TW 507 2005-01	Standard series for determination the microstructure of creep resting steels for high pressure pipelines and vessels	K
ASTM E 112 2013-01	Determining average grain size	K
ASTM E 45 2013-01	Standard Test Methods for Determining the inclusion content of steel	K
SEP 1572 1971-08	Microscopic test of free cutting steels for solid nonmetallic inclusions in metal by means of strip mosaics	K
ASTM A 923 2014-01	Standard Test Methods for Detecting Detrimental Intermetallic Phase in Duplex Austenitic/Ferritic Stainless Steels	K
EURONORM 103 1971	Microscopic determination of the ferrite or austenitic grain size of steels <i>(withdrawn document)</i>	K
<b>Plastics analysis</b>		
DIN EN ISO 178 2013-09	Plastics - Determination of flexural properties	K
DIN EN ISO 527-1 2012-06	Plastics - Determination of tensile properties - Part 1: General principles	K
DIN EN ISO 527-2 2012-06	Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics	K
DIN EN ISO 527-3 2003-07	Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets	K
DIN EN ISO 527-4 1997-07	Plastics - Determination of tensile properties - Part 4: Test conditions for isotropic and anisotropic fibre-reinforced plastic composites	K
DIN EN ISO 14125 2011-05	Fibre-reinforced plastic composites - Determination of flexural properties	K

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DIN EN ISO 2815 2003-10	Paints and varnishes - Buchholz indentation test	K
DIN 53504 2009-10	Testing of rubber - determination of tensile strength at break, tensile stress at yield, elongation at break and stress values in a tensile test	K
DIN ISO 7619-1 2012-02	Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 1: Durometer method (Shore hardness)	K
DIN EN ISO 1172 1998-12	Textile-glass-reinforced plastics - Prepregs, moulding compounds and laminates - Determination of the textile-glass and mineral-filler content - calcination methods	K
DIN EN 59 1977-11	Glass Reinforced Plastics - Measurement of Hardness by Means of a Barcol Impressor	K
	<b>in connection with:</b>	
	<i>DVS 2202-1 2006-07</i>	<i>Imperfections in thermoplastic welding joints - Features, descriptions, evaluation</i>
DVS 2203-1 2003-01	Testing of welded joints of thermoplastics sheet and pipes - Test methods - Requirements	K
DVS 2203-2 2010-08	Testing of welded joints between panels and pipes made of thermoplastics - Tensile test	K
DVS 2203-5 1999-08	Testing of welded joints of thermoplastics plates and tubes - Technological bend test	K
DVS 2206 1975-11	Testing of building components and structures of thermoplastics ( <i>withdrawn document</i> )	K
DVS 2206-1 2011-09	Non-destructive testing of thermoplastic vessels and pipelines - dimensional and visual testing	K

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DVS 2206-4 2011-09	Non-destructive tests on tanks, apparatus and piping made of thermoplastics - Testing with electrical high voltage	K
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	K

**Determination of inorganic fibrous particles in filters and solids**

VDI 3492 2013-06	Indoor air measurement - Ambient air measurement - Measurement of inorganic fibrous particles - Scanning electron microscopy method (without sampling)	K
VDI 3861 Sheet 2 2008-01	Stationary source emissions - Measurement of inorganic fibrous particles in exhaust gas - Scanning electron microscopy method (without sampling)	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 2004-10	Determination of asbestos in technical products - Scanning electron microscopy method (without sampling)	K

**in connection with:**

<i>VDI 3866 Sheet 1 2000-12</i>	<i>Determination of asbestos in technical products - Principle - Sampling and sample preparation</i>
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VDI 3877 Sheet 1 2011-09	Indoor air pollution - Measurement of fibrous dust on settled on surfaces - Sampling and analysis (REM/EDXA) (without sampling)
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**applicable standards:**

<i>GefStoffV (26.11.2010) - Anhang I, Nr. 2 - Anhang II, Nr. 1 und Nr. 5</i>	K
<i>Asbest Richtlinie (1 - 1996 / NRW 1997)</i>	K



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TRGS 402 2010-01	Analysis and evaluation the Health hazard of hazardous materials at working places	K
TRGS 519 2014-01	Asbestos: demolition - , clean up- or maintenance operations	K
TRGS 905 2014-03	Index of carcinogenic -, gene-changing or toxic to reproduction substances	K

**Abbreviations used:**

AD HP	Working group of pressure vessels; Production and testing
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AVS	Standard operation procedure
BGI	Employers' Liability Insurance Association Information
DIN	German Institute for Standardization
DVS	German welding society (DVS).
DVGW	German Technical and Scientific Association for Gas and Water
EN	European Standard
GESA	Association of experimental microstructure analysis
IEC	International Electrotechnical Commission
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
TRBS	Technical rules for operating safety
TRGS	Technical rules
VDA	German Association of the Automotive Industry
VDE	Association for Electrical, Electronical & Information Technologies
VDI	Association of German Engineers
VdTÜV	Association of TÜVs
VGB	European technical association for power and heat generation