

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-17360-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 25.10.2021

Date of issue: 25.10.2021

Holder of certificate:

**Outokumpu Nirosta GmbH
Zentrales Prüflaboratorium Krefeld
Oberschlesienstraße 16, 47807 Krefeld**

Tests in the fields:

**Spark emission spectrometry of steel and ferrous materials;
Mechanical-technological testing of steels and surface tests;
Chemical and metallographic testing of steels;
Corrosion testing of metallic materials;
Selected methods for analysis of waste water;
Specialist module for water**

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 procedures 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 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

Page 1 of 11

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

Annex to the accreditation certificate D-PL-17360-01-00

1 Testing of steels and ferrous materials ***

DIN EN ISO 15350 2010-08	Steel and iron - Determination of total carbon and sulphur content - Infrared absorption method after combustion in an induction furnace (routine method)
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)
DIN EN 10276-2 2003-10	Chemical analysis of ferrous materials - Determination of oxygen content in steel and iron - Part 2: Infrared method after fusion under inert gas
OTK factory specification AVS E-W-C12 2016-05	Determination of C, Si, Mn, P, S, Cr, Mo, Ni, V, W, Co, Cu, Sn, Al, B, As, Ti, Nb, Pb, Sb in steels by emission spectrometric analysis

2 Analysis of waste water

DIN 38404-C 4 1976-12	Determination of temperature
DIN EN ISO 10523 (C 5) 2012-04	Water quality - Determination of pH
DIN EN 27888 (C 8) 1993-11	Water quality; Determination of electrical conductivity
DIN EN 26777 (D 10) 1993-04	Water quality; determination of nitrite; spectrometric method
DIN EN ISO 10304-1 (D 20) 2009-07	Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulphate (Limitation: <i>no nitrite</i>)
DIN 38405-D 24 1987-05	Photometric determination of chromium(VI) using 1,5-diphenylcarbonohydrazide
DIN 38406-E 5-1 1983-10	Photometric determination of ammonium nitrogen using sodium dichloroisocyanurate and sodium salicylate
DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of selected elements by inductively coupled plasma optical emission spectroscopy (ICP-OES)

Valid from: 25.10.2021
Date of issue: 25.10.2021

Annex to the accreditation certificate D-PL-17360-01-00

DIN 38409-H 9-2 1980-07	Determination of the settleable matter by volume in water and waste water with a sample volume of 2 l
DIN EN 872 (H 33) 2005-04	Water quality – Determination of suspended solids – Method by filtration through glass fibre filters
DIN 38409-H 41 1980-12	Determination of chemical oxygen demand (COD) in the range over 15 mg/l

3 Test method list for specialist module for WATER

Revised: LAWA of 18.10.1018

Section 1: Sampling and general parameters

not used

Section 2: Photometry, ion chromatography, titration

Parameter	Method	Was	Sur	Raw
UV absorption at 254 nm (SAC 254)	DIN 38404-C 3: 2005-07	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
UV absorption at 436 nm (SAC 436)	DIN EN ISO 7887: 2012-09 (C 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ammonium nitrogen	DIN EN ISO 11732: 2005-05 (E 23)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38406-E 5: 1983-10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14911: 1999-12 (E 34)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN ISO 15923-1: 2014-07 (D 49)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nitrite nitrogen	DIN EN 26777: 1993-04 (D 10)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 10304-1: 2009-07 (D 20)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 13395: 1996-12 (D 28)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN ISO 15923-1: 2014-07 (D 49)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nitrate nitrogen	DIN EN ISO 10304-1: 2009-07 (D 20)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 13395: 1996-12 (D 28)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38405-D 9: 2011-09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38405-D 29: 1994-11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN ISO 15923-1: 2014-07 (D 49)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total phosphorus	DIN EN ISO 6878: 2004-09 (D 11)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15681-1: 2005-05 (D 45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15681-2: 2005-05 (D 46)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Valid from: 25.10.2021

Date of issue: 25.10.2021

Parameter	Method	Was	Sur	Raw
Orthophosphate	DIN EN ISO 10304-1: 2009-07 (D 20)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 6878: 2004-09 (D 11)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15681-1: 2004-07 (D 45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15681-2: 2005-05 (D 46)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN ISO 15923-1: 2014-07 (D 49)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fluoride (dissolved)	DIN 38405-D 4, section 1985-07	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 10304-1: 2009-07 (D 20)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chloride	DIN EN ISO 10304-1: 2009-07 (D 20)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15682: 2002-01 (D 31)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN ISO 15923-1: 2014-07 (D 49)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 10304-4: 1999-07 (D 25)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38405-D 1: 1985-12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulphate	DIN EN ISO 10304-1: 2009-07 (D 20)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38405-D 5: 1985-01	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN ISO 15923-1: 2014-07 (D 49)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide (readily liberated)	DIN 38405-D 13-2: 1981-02	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14403-1: 2012-10 (D 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14403-2: 2012-10 (D 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38405-D 7: 2002-04	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide (total)	DIN 38405-D 13-2: 1981-02	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14403-1: 2012-10 (D 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14403-2: 2012-10 (D 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38405-D 7: 2002-04	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chromium VI	DIN 38405-D 24: 1987-05	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 10304-3: 1997-11 (D 22), Section 6 (dissolved chromate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 23913: 2009-09 (D 41)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 18412: 2007-02 (D 40)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulphide (readily liberated)	DIN 38405-D 27: 1992-07	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 3: Elemental analysis

Parameter	Method	Was	Sur	Raw
Aluminium	DIN EN ISO 11885: 2009-09 (E 22)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 12020: 2000-05 (E 25)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arsenic	DIN EN ISO 11969: 1996-11 (D 18)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 11885: 2009-09 (E 22)	<input type="checkbox"/>		
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38405-D 35: 2004-09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lead	DIN EN ISO 11885: 2009-09 (E 22)	<input type="checkbox"/>		
	DIN 38406-E 6: 1998-07	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cadmium	DIN EN ISO 11885: 2009-09 (E 22)	<input type="checkbox"/>		
	DIN EN ISO 5961: 1995-05 (E 19)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02(E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Calcium	DIN EN ISO 11885: 2009-09 (E 22)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38406-E 3: 2002-03		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 7980: 2000-07 (E 3a)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14911: 1999-12 (E 34)		<input type="checkbox"/>	<input type="checkbox"/>
Chromium	DIN EN ISO 11885: 2009-09 (E 22)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN 1233: 1996-08 (E 10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Iron	DIN EN ISO 11885: 2009-09 (E 22)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38406-E 32: 2000-05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38406-E 1: 1983-05		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E29), with collision cell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Potassium	DIN 38406-E 13: 1992-07		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 11885: 2009-09 (E 22)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14911: 1999-12 (E 34)		<input type="checkbox"/>	<input type="checkbox"/>

Parameter	Method	Was	Sur	Raw
Copper	DIN EN ISO 11885: 2009-09 (E 22)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38406-E 7: 1991-09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manganese	DIN EN ISO 11885: 2009-09 (E 22)			<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)			<input type="checkbox"/>
	DIN 38406-E 33: 2000-06			<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)			<input type="checkbox"/>
	DIN EN ISO 14911: 1999-12 (E 34)			<input type="checkbox"/>
Sodium	DIN 38406-E 14: 1992-07		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 11885: 2009-09 (E 22)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14911: 1999-12 (E 34)		<input type="checkbox"/>	<input type="checkbox"/>
Nickel	DIN EN ISO 11885: 2009-09 (E 22)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38406-E 11: 1991-09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mercury	DIN EN 1483: 2007-07 (E 12)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17852: 2008-04 (E 35)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 12846: 2012-08 (E 12)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zinc	DIN EN ISO 11885: 2009-09 (E 22)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38406-E 8: 2004-10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15586: 2004-02 (E 4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boron	DIN EN ISO 11885: 2009-09 (E 22)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magnesium	DIN EN ISO 11885: 2009-09 (E 22)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38406-E 3: 2002-03		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 7980: 2000-07 (E 3a)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14911: 1999-12 (E 34)		<input type="checkbox"/>	<input type="checkbox"/>
Phosphorus (phosphorus compounds in original sample as phosphorus)	DIN EN ISO 11885: 2009-09 (E 22)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17294-2: 2005-02 (E 29)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 4/5: Group and sum parameters

Parameter	Method	Was	Sur	Raw
Biological oxygen demand (BOD ₅)	DIN EN 1899-1: 1998-05 (H 51)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN 1899-2: 1998-05 (H 52)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical oxygen demand (COD)	DIN 38409-H 41: 1980-12	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38409-H 44: 1992-05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN ISO 15705: 2003-01 (H 45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phenol index	DIN 38409-H 16-2: 1984-06	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38409-H 16-1: 1984-06	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 14402: 1999-12 (H 37)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Methods in accordance with Section 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Filterable solids	DIN EN 872: 2005-04 (H 33)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38409-H 2-3: 1987-03	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acid and base capacity	DIN 38409-H 7: 2005-12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total organic carbon (TOC)	DIN EN 1484: 1997-08 (H 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dissolved organic carbon (DOC)	DIN EN 1484: 1997-08 (H 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total bound nitrogen (TN _b)	DIN EN 12260: 2003-12 (H 34)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 11905-1: 1998-08 (H 36)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adsorbable organic halogens (AOX)	DIN EN ISO 9562: 2005-02 (H 14)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38409-H 22: 2001-02	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 6: Gas chromatographic methods

not used

Section 7: HPLC methods

not used

Section 8: Microbiological methods

not used

Section 9.1: Biological methods, bio-assays (part 1)

not used

Section 9.2: Biological methods, bio-assays (part 2)

not used

Annex to the accreditation certificate D-PL-17360-01-00

4 Material behaviour under mechanical stress ***

ISO 7668 2018-02	Anodizing of aluminium and its alloys - Measurement of specular reflectance and specular gloss of anodic oxidation coatings at angles of 20°, 45°, 60° or 85° <i>(here application to bright-annealed stainless steels)</i>
ISO 10113 2006-09	Metallic materials - Sheet and strip - Determination of plastic strain ratio
DIN EN ISO 4288 1998-04	Geometrical Product Specifications (GPS) - Surface texture: Profile method - Rules and procedures for the assessment of surface texture
DIN EN ISO 6507-1 2006-03	Metallic materials - Vickers hardness test - Part 1: Test methods
DIN EN ISO 6508-1 2016-12	Metallic materials - Rockwell hardness test - Part 1: Test method (scales B, C, F)
DIN EN ISO 6892-1 2017-02	Metallic materials - Tensile testing - Part 1: Method of test at room temperature (method B)
DIN EN ISO 7438 2016-07	Metallic materials - Bend test
DIN EN 10049 2014-03	Measurement of roughness average Ra and peak count R _{Pc} on metallic flat products

5 Metallographic testing ***

5.1 Testing of steels for non-metallic inclusions

ISO 4968 1979-11	Steel - Macrographic examination by sulfur print (Baumann method)
DIN 50602 1985-09	Metallographic examination - Microscopic examination of special steels using standard diagrams to assess the content of non-metallic inclusions
ASTM E 45 2018	Standard Test Methods for Determining the Inclusion Content of Steel
ASTM E381 2017	Standard Method of Macroetch Testing Steel Bars, Billets, Blooms, and Forgings

Valid from: 25.10.2021
Date of issue: 25.10.2021

Annex to the accreditation certificate D-PL-17360-01-00

ASTM E 562 2011	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count
OTK Werkspezifikation BAE-WI-RD-KR-RD-1207_de 2019-10	Microscopic examination of special steels using standard diagrams to assess the content of non-metallic inclusions

5.2 Determination of grain size

DIN EN ISO 643 2013-05	Steels - Micrographic determination of the apparent grain size
ASTM E 112 2013	Standard Test Methods for Determining Average Grain Size

6 Corrosion testing ***

6.1 General corrosion tests

DIN EN ISO 6270-2 2018-04	Paints and varnishes - Determination of resistance to humidity - Part 2: Procedure for exposing test specimens in condensation-water atmospheres
DIN EN ISO 9227 2017-07	Corrosion tests in artificial atmospheres - Salt spray tests
DIN 50905-1 2009-09	Corrosion of metals - Corrosion testing - Part 1: General guidance
DIN 50905-2 1987-01	Corrosion of metals - Corrosion testing - Corrosion characteristics under uniform corrosion attack
DIN 50905-3 1987-01	Corrosion of metals - Corrosion testing - Corrosion characteristics under nonuniform and localized corrosion attack without mechanical stress
DIN 50905-4 1987-01	Corrosion of metals - Corrosion testing - Corrosion testing in liquids under laboratory conditions without mechanical stress
ASTM B 117 2018	Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM B 368 2009	Standard Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test)

Valid from: 25.10.2021
Date of issue: 25.10.2021

ASTM G 85
2011

Standard Practice for Modified Salt Spray (Fog) Testing

6.2 Special corrosion tests on ferrous materials

ISO 3651-3 2017-05	Determination of resistance to intergranular corrosion of stainless steels - Part 3: Corrosion test for low-Cr ferritic stainless steels
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)
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 sulphuric acid
SEP 1877 1994-07	Test of the resistance of high-alloy, corrosion-proof materials against intercrystalline corrosion
ASTM A 923 2014	Standard Test Methods for Detecting Detrimental Intermetallic Phase in Wrought Duplex Austenitic/Ferritic Stainless Steels
ASTM A 262 2015	Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels
ASTM G 28 2002	Standard Test Methods of Detecting Susceptibility to Inter-granular Corrosion in Wrought, Nickel-Rich, Chromium-Bearing Alloys
ASTM G 48 2011	Standard Test Methods for Pitting and Crevice Corrosion Resistance of Stainless Steels and related Alloys by Use of Ferritic Chloride Solution
ASTM G 150 2013	Standard Test Method for Electrochemical Critical Pitting Temperature Testing of Stainless Steels

Annex to the accreditation certificate D-PL-17360-01-00

6.3 Testing of inorganic coatings

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
VDA-Prüfblatt 621-415 1982-02	Test of the corrosion protection of motor vehicles under cyclically changing loads

6.4 Corrosion tests of general importance

DIN 50918 2018-09	Corrosion of metals; electrochemical corrosion tests
ASTM G 5 2014	Standard Reference Test Method for Making Potentiostatic and Potentiodynamic Anodic Polarization Measurements
ASTM G 36 1994	Standard Practice for Evaluating Stress-Corrosion; Cracking Resistance of Metals and Alloys in a Boiling Magnesium Chloride Solution

Abbreviations used:

ASTM	American Society for Testing and Materials
DIN	Deutsches Institut für Normung e. V. (German Institute for Standardization)
EN	European standard
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
SEP	Stahl-Eisen-Prüfblatt (steel-iron test sheet)
VDA	Verband der Automobilindustrie e. V. (Association of the German Automotive Industry)
OTK	In-house method of Outokumpu Nirosta GmbH