

## Deutsche Akkreditierungsstelle GmbH

### Annex to the Accreditation Certificate D-PL-18478-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 13.06.2018 to 12.06.2023

Date of issue: 13.07.2018

Holder of certificate:

**MT Laboratories GmbH**

with the locations

**Am Eisenbrand 24a, 40667 Meerbusch  
Bliersheimer Straße 33 a, 47229 Duisburg**

Tests in the fields:

**manual non-destructive testing (radiographic-, ultrasonic-, magnetic particle- and penetration testing); automated ultrasonic testing; selected mechanical test and metallographic examination; optical emission spectrometry at low- and high alloyed steels as well as corrosion tests at metallic components of plant engineering and plant construction**

Abbreviations used: see last page

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

M = Meerbusch

D = Duisburg

## 1 Non-destructive testing

### 1.1 Radiographic testing

|   |  |   |
|---|--|---|
| ASME Code Sec. V Art. 2 + 22<br>2015    | Radiographic testing<br>( <i>withdrawn document</i> )  | M |
| ASME Code Sec. VIII Art. 1<br>2015      | Radiographic testing<br>( <i>withdrawn document</i> )  | M |
| DIN EN ISO 17636-1<br>2013-05           | Non-destructive testing of welds - Radiographic testing -<br>Part 1: X- and gamma-ray techniques with film   | M |
| DIN EN 10246-10<br>2001-07              | Non-destructive testing of steel tubes - Part 10: Radiographic<br>testing of the weld seam of automatic fusion arc welded steel<br>tubes for the detection of imperfections<br>( <i>withdrawn standard</i> ) | M |
| DIN EN ISO 10893-6<br>2011-07           | Non-destructive testing of steel tubes - Part 6: Radiographic<br>testing of the weld seam of welded steel tubes for the<br>detection of imperfections  | M |
| ISO 12096<br>1996-05                    | Submerged arc-welded steel tubes for pressure purposes -<br>Radiographic testing of the weld seam for the detection of<br>imperfections<br>( <i>zurückgezogene Norm</i> )                                    | M |
| DIN EN 12681<br>2003-06                 | Founding - Radiographic examination  | M |
| ASME B 31.3<br>2014                     | Radiographic Examination K 344.5   | M |
| ASME E 94<br>2004<br>(reapproved: 2010) | Standard Guide for Radiographic Examination  | M |

### 1.2 Ultrasonic testing

|                           |   |      |
|---------------------------|---|------|
| DIN EN 10228-3<br>2016-10 | Non-destructive testing of steel forgings - Part 3: Ultrasonic<br>testing of ferritic or martensitic steel forgings | D, M |
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| DIN EN 10228-4<br>2016-10 | Non-destructive testing of steel forgings - Part 4: Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings   | D, M |
| ASTM E 213<br>2014        | Standard practice for ultrasonic testing of metal pipe and tubing   | D, M |
| ASTM A 577/A 577M<br>2017 | Standard specification for ultrasonic angle-beam examination of Steel Plates  | D, M |
| DIN EN 583-3<br>1997-06   | Non-destructive testing - Ultrasonic testing - Part 3: Transmission technique<br><i>(withdrawn standard)</i>  | D, M |
| DIN EN 583-4<br>2002-12   | Non-destructive testing - Ultrasonic examination - Part 4: Examination for discontinuities perpendicular to the surface<br><i>(withdrawn standard)</i>  | D, M |
| ISO 9303<br>1989-08       | Seamless and welded (except submerged arc-welded) steel tubes for pressure purposes - Full peripheral ultrasonic testing for the detection of longitudinal imperfections<br><i>(withdrawn standard)</i> | D, M |
| ISO 9764<br>1989-08       | Electric resistance and induction welded steel tubes for pressure purposes - Ultrasonic testing of the weld seam for the detection of longitudinal imperfections<br><i>(withdrawn standard)</i>         | D, M |
| ISO 9765<br>1990-12       | Submerged arc-welded steel tubes for pressure purposes - Ultrasonic testing of the weld seam for the detection of longitudinal and/or transverse imperfections<br><i>(withdrawn standard)</i>           | D, M |
| ISO 10124<br>1994-12      | Seamless and welded (except submerged arc-welded) steel tubes for pressure purposes - Ultrasonic testing for the detection of laminar imperfections<br><i>(withdrawn standard)</i>                      | D, M |
| ISO 11496<br>1993-11      | Seamless and welded steel tubes for pressure purposes - Ultrasonic testing of tube ends for the detection of laminar imperfections<br><i>(withdrawn standard)</i>                                       | D, M |

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| ISO 12094<br>1994-12       | Welded steel tubes for pressure purposes - Ultrasonic testing for the detection of laminar imperfections in strips/plates used in the manufacture of welded tubes<br><i>(withdrawn standard)</i>  | D, M |
| ISO 13663<br>1995-12       | Welded steel tubes for pressure purposes - Ultrasonic testing of the area adjacent to the weld seam for the detection of laminar imperfections<br><i>(withdrawn standard)</i>   | D, M |
| DIN EN 10246-6<br>2000-03  | Non-destructive testing of steel tubes - Part 6: Automatic full peripheral ultrasonic testing of seamless steel tubes for the detection of transverse imperfections<br><i>(withdrawn standard)</i>                                      | D, M |
| DIN EN 10246-7<br>2005-12  | Non-destructive testing of steel tubes - Part 7: Automatic full peripheral ultrasonic testing of seamless and welded (except submerged arc welded) tubes for the detection of longitudinal imperfections<br><i>(withdrawn standard)</i> | D, M |
| DIN EN 10246-8<br>2000-03  | Non-destructive testing of steel tubes - Part 8: Automatic ultrasonic testing of the weld seam of electric welded steel tubes for the detection of longitudinal imperfections<br><i>(withdrawn standard)</i>                            | D, M |
| DIN EN 10246-9<br>2000-06  | Non-destructive testing of steel tubes - Part 9: Automatic ultrasonic testing of the weld seam of submerged arc-welded steel tubes for the detection of longitudinal and/or transverse imperfections<br><i>(withdrawn standard)</i>     | D, M |
| DIN EN 10246-14<br>2000-03 | Non-destructive testing of steel tubes - Part 14: Automatic ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of laminar imperfections<br><i>(withdrawn standard)</i>               | D, M |
| DIN EN 10246-16<br>2000-07 | Non-destructive testing of steel tubes - Part 16: Automatic ultrasonic testing of the area adjacent to the weld seam of welded steel tubes for the detection of laminar imperfections<br><i>(withdrawn standard)</i>                    | D, M |

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| DIN EN 10246-17<br>2000-07     | Non-destructive testing of steel tubes - Part 17: Ultrasonic testing of tube ends of seamless and welded steel tubes for the detection of laminar imperfections<br><i>(withdrawn standard)</i>                                    | D, M |
| DIN EN 10307<br>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)  | D, M |
| DIN EN 10308<br>2002-03        | Non-destructive testing - Ultrasonic testing of steel bars  | D, M |
| DIN EN ISO 10893-8<br>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   | D, M |
| DIN EN ISO 10893-9<br>2011-07  | Non-destructive testing of steel tubes - Part 9: Automated ultrasonic testing for the detection of laminar imperfections in strip/plate used for the manufacture of welded steel tubes  | D, M |
| DIN EN ISO 10893-10<br>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 | D, M |
| DIN EN ISO 10893-11<br>2011-07 | Non-destructive testing of steel tubes - Part 11: Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections   | D, M |
| DIN EN ISO 10893-12<br>2011-07 | Non-destructive testing of steel tubes - Part 12: Automated full peripheral ultrasonic thickness testing of seamless and welded (except submerged arc-welded) steel tubes   | D, M |
| DIN EN ISO 23279<br>2017-12    | Non-destructive testing of welds - Ultrasonic testing - Characterization of discontinuities in welds  | D, M |
| DIN EN ISO 17640<br>2011-04    | Non-destructive testing of welds - Ultrasonic testing - Techniques, testing levels, and assessment<br><i>(here: chapter 7-10)</i>   | D, M |

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| DIN EN 10160<br>1999-09               | Ultrasonic testing of steel flat product of thickness equal to or greater than 6 mm (reflection method)                    | D, M |
| DIN EN 12680-3<br>2012-02             | Non-destructive testing of steel forgings - Part 3: Ultrasonic testing of ferritic or martensitic steel forgings           | D, M |
| SEL 072<br>1977-12                    | Ultrasonically tested heavy plate - technical delivery specifications<br><i>(withdrawn document)</i>                       | D, M |
| SEP 1915<br>Second Edition<br>1989-12 | Ultrasonic testing for longitudinal defects in pipes<br><i>(withdrawn document)</i>  | D, M |
| SEP 1918<br>Second Edition<br>1992-01 | Ultrasonic testing for transverse defects of pipes<br><i>(withdrawn document)</i>  | D, M |
| SEP 1919<br>1977-06                   | Ultrasonic testing for laminations of pipes of creep-resistant steels<br><i>(withdrawn document)</i>                       | D, M |
| SEP 1923<br>Second Edition<br>2009-02 | Ultrasonic testing of steel forgings to stringent standards, in particular for components in turbine and generator systems | D, M |
| SEP 1924<br>1989-10                   | Ultrasonic testing of castings made of cast iron with spheroidal graphite<br><i>(withdrawn document)</i>                   | D, M |
| DIN 54125<br>1989-01                  | Non-destructive testing - manual ultrasonic examination of welded joint<br><i>(withdrawn standard)</i>                     | D, M |
| ASTM A 745/A 745M<br>2015             | Standard Practice for Ultrasonic Examination of Austenitic Steel Forgings  | D, M |
| ASTM E 114<br>2015                    | Standard Practice for Ultrasonic Pulse-Echo Straight-Beam Contact Testing  | D, M |
| ASTM E 164<br>2013                    | Standard Practice for Contact Ultrasonic Testing of Weldments  | D, M |
| ASTM E 273<br>2015                    | Standard Practice for Ultrasonic Testing of the Weld Zone of Welded Pipe and Tubing  | D, M |

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| ASTM E 428<br>2008<br>(reapproved 2013) | Standard Practice for Fabrication and Control of Metal, Other than Aluminum, Reference Blocks Used in Ultrasonic Testing  | M    |
| ASTM E 587<br>2015                      | Standard Practice for Ultrasonic Angle-Beam Contact Testing   | D, M |
| ASTM E 797/E 797M<br>2015               | Standard Practice for Measuring Thickness by Manual Ultrasonic Pulse-Echo Contact Method  | D, M |
| API 5 L<br>2013-07                      | Specification for line Pipe Ultrasonic Examination  | D, M |
| API 5 LD<br>2009-09                     | Specification for CRA Clad or Lined Steel Pipe<br>Non-destructive examination / Ultrasonic Examination  | D, M |
| API 5 CRA<br>2010-08                    | Specification for Corrosion Resistant Alloy<br>Seamless Tube for Use as Casing, Tubing and Coupling Stock<br>Non-destructive examination / Ultrasonic Examination | D, M |
| DNV-OS-F 101<br>2013-10                 | Submarine Pipeline Systems<br>Non-destructive Testing / Ultrasonic Examination  | D, M |
| DIN EN ISO 16823<br>2014-07             | Non-destructive testing - Ultrasonic testing - Transmission technique   | D, M |
| DIN EN ISO 16810<br>2014-07             | Non-destructive testing - Ultrasonic testing - General principles<br>(here: <i>chapter 9</i> )  | D, M |
| DIN EN ISO 16826<br>2014-06             | Non-destructive testing - Ultrasonic testing - Examination for discontinuities perpendicular to the surface   | D, M |
| DIN EN ISO 16827<br>2014-06             | Non-destructive testing - Ultrasonic testing - Characterization and sizing of discontinuities   | D, M |

**1.3 Manual Ultrasonic testing**

|                         |  |      |
|-------------------------|--|------|
| DIN EN 583-5<br>2001-02 | Non-destructive testing - Ultrasonic examination - Part 5: Characterization and sizing of discontinuities<br>( <i>withdrawn standard</i> ) | D, M |
| DIN EN 14127<br>2011-04 | Non-destructive testing - Ultrasonic thickness measurement   | D, M |

|                     |  |      |
|---------------------|--|------|
| SEP 1921<br>1984-12 | Ultrasonic testing of forgings and forged steel bars with diameters or edge lengths of ~ 100 mm and above<br><i>(withdrawn standard)</i> | D, M |
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#### 1.4 Automatic Ultrasonic testing

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|----------------------------|--|------|
| DIN EN 10246-13<br>2000-07 | Non-destructive testing of steel tubes - Part 13: Automatic full peripheral ultrasonic thickness testing of seamless and welded (except submerged arc welded) steel tubes<br><i>(withdrawn standard)</i> | D, M |
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#### 1.5 Magnetic particle testing

|                        |                                      |      |
|------------------------|--------------------------------------|------|
| DIN EN 1369<br>2013-01 | Founding - Magnetic particle testing | D, M |
|------------------------|--------------------------------------|------|

|  |                               |      |
|--|-------------------------------|------|
| ASME Code Sec. V<br>Article 7 and 25<br>2015 | Magnetic Particle Examination | D, M |
|--|-------------------------------|------|

|   |                               |      |
|---|-------------------------------|------|
| ASME Code Sec. VIII<br>Appendix 6<br>2015 | Magnetic Particle Examination | D, M |
|---|-------------------------------|------|

|                              |   |      |
|------------------------------|---|------|
| DIN EN ISO 9934-1<br>2017-03 | Non-destructive testing - Magnetic particle testing - Part 1: General principles<br><i>(here: chapter 7-14)</i> | D, M |
|------------------------------|---|------|

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|-----------------------------|--|------|
| DIN EN ISO 17638<br>2017-03 | Non-destructive testing of welds - Magnetic particle testing | D, M |
|-----------------------------|--|------|

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|---------------------------|--|------|
| DIN EN 10228-1<br>2016-10 | Non-destructive testing of steel forgings - Part 1: Magnetic particle inspection | D, M |
|---------------------------|--|------|

|                     |   |      |
|---------------------|---|------|
| SEP 1935<br>1982-06 | Seam testing of castings of steel - magnetic powder test<br><i>(withdrawn standard)</i> | D, M |
|---------------------|---|------|

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|----------------------------|---|------|
| DIN EN 10246-12<br>2000-07 | Non-destructive testing of steel tubes - Part 12: Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections<br><i>(withdrawn standard)</i> | D, M |
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| DIN EN ISO 10893-5<br>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 | D, M |
| ASME B 31.3<br>Edition 2012<br>2014 | Magnetic Particle Examination<br><i>(reference to ASTM E 709 and BPV Code, Section V, Article 7)</i>  | D, M |
| ASTM E 709<br>2015                  | Standard Guide for Magnetic Particle Testing  | D, M |

**1.6 Liquid penetrant testing**

|                               |   |      |
|-------------------------------|---|------|
| DIN EN 571-1<br>1997-03       | Non-destructive testing - Penetrant testing - Part 1: General principles<br><i>(withdrawn standard)</i>   | D, M |
| DIN EN 1371-1<br>2012-02      | Founding - Liquid penetrant testing - Part 1: Sand, gravity die and low pressure die castings   | D, M |
| DIN EN 10228-2<br>2016-10     | Non-destructive testing of steel forgings - Part 2: Penetrant testing   | D, M |
| ASME Code Sec. V<br>2015      | Article 6 - Liquid Penetrant Examination / Article 24: Liquid Penetrant Standards   | D, M |
| DIN EN 10246-11<br>2000-06    | Non-destructive testing of steel tubes - Part 11: Liquid penetrant testing of seamless and welded steel tubes for the detection of surface imperfections<br><i>(withdrawn standard)</i> | D, M |
| DIN EN ISO 10893-4<br>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                              | D, M |
| DIN 54152-1<br>1989-07        | Non-destructive testing - penetrant inspection - procedure<br><i>(withdrawn standard)</i>   | D, M |
| ASME B 31.3<br>Edition 2014   | Liquid Penetration<br><i>(Reference to BPV Code, Section V, Article 6)</i>  | D, M |

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| DIN EN ISO 3452-1<br>2014-09 | Non-destructive testing - Penetrant testing - Part 1: General principles<br>(here: <i>chapter 8</i> ) | D, M |
| ASTM E 165/E 165M<br>2012    | Standard Practice for Liquid Penetrant Examination for General Industry                               | D, M |

**1.7 Methods cross standards (here for: RT, UT, MT, PT)**

|   |  |      |
|---|--|------|
| AD 2000-Merkblatt HP 5/3<br>2015-04             | Manufacture and testing of joints - Non-destructive testing of welded joints                                       | D, M |
| RCC-M<br>2007                                   | Design and construction rules for mechanical components of PWR nuclear islands - Section III - Examination Methods | D, M |
| AD 2000-Merkblatt HP 5/3<br>Anlage 1<br>2015-04 | Non-destructive testing of welded joints - Minimum requirements for non-destructive testing methods                | D, M |

**2 Mechanical tests**

|                              |  |      |
|------------------------------|--|------|
| ASTM E 384<br>2017           | Standard Test Method for Vickers Hardness of Metallic Materials                | D, M |
| ASTM E 18<br>2017            | Standard Test Methods for Rockwell Hardness of Metallic Materials              | D, M |
| ASTM A 370<br>2017           | Standard Test Methods and Definitions for Mechanical Testing of Steel Products | D, M |
| DIN EN ISO 6506-1<br>2015-02 | Metallic materials - Brinell hardness test - Part 1: Test method               | D, M |
| ASTM E 10<br>2017            | Standard Test Method for Brinell Hardness of Metallic Materials                | D, M |
| DIN EN ISO 6507-1<br>2006-03 | Metallische Werkstoffe - Härteprüfung nach Vickers - Teil 1: Prüfverfahren     | D, M |
| ASTM E 92<br>2017            | Standard Test Method for Vickers Hardness of Metallic Materials                | D, M |

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| DIN EN ISO 6508-1<br>2016-12 | Metallic materials - Rockwell hardness test - Part 1: Test method<br>(here: <i>only scale C</i> )                                  | D, M |
| ASTM E 18<br>2017            | Standard Test Methods for Rockwell Hardness of Metallic Materials  | D, M |
| DIN EN ISO 9015-1<br>2011-05 | Destructive tests on welds in metallic materials - Hardness testing - Part 1: Hardness test on arc welded joints                   | D, M |
| DIN EN ISO 7438<br>2016-07   | Metallic materials - Bend test   | D, M |
| DIN EN ISO 7799<br>2000-07   | Metallic materials - Sheet and strip 3 mm thick or less - Reverse bend test  | M    |
| DIN EN ISO 6892-1<br>2017-02 | Metallic materials - Tensile testing - Part 1: Method of test at room temperature<br>(here: <i>procedure A and B</i> )             | D, M |
| DIN EN ISO 6892-2<br>2011-05 | Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature<br>(here: <i>procedure A and B</i> )         | D, M |
| DIN EN ISO 148-1<br>2017-05  | Metallic materials - Charpy pendulum impact test - Part 1: Test method   | D, M |
| ASTM E 23a<br>2012           | Standard Test Methods for Notched Bar Impact Testing of Metallic Materials<br>( <i>withdrawn standard, replaced by ASTM E23b</i> ) | D, M |
| ASTM E 23b<br>2016           | Standard Test Methods for Notched Bar Impact Testing of Metallic Materials   | D, M |
| DIN EN ISO 8492<br>2014-03   | Metallic materials - Tube - Flattening test  | D, M |
| DIN EN ISO 8493<br>2004-10   | Metallic materials - Tube - Drift-expanding test   | D, M |
| DIN EN ISO 8494<br>2014-03   | Metallic materials - Tube - Flanging test  | D, M |

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| DIN EN ISO 8495<br>2014-03 | Metallic materials - Tube - Ring-expanding test  | D, M |
| DIN EN ISO 8496<br>2014-03 | Metallic materials - Tube - Ring tensile test  | D, M |
| DIN EN 1561<br>2012-01     | Founding - Grey cast irons   | D, M |
| DIN EN 1563<br>2012-03     | Founding - Spheroidal graphite cast irons  | D, M |
| DIN EN 1320<br>1996-12     | Destructive tests on welds in metallic materials - Fracture test<br><i>(withdrawn standard)</i>                        | D, M |
| DIN EN ISO 4136<br>2013-02 | Destructive tests on welds in metallic materials - Transverse tensile test   | D, M |
| DIN EN ISO 5173<br>2012-02 | Destructive tests on welds in metallic materials - Bend tests  | D, M |
| DIN EN 10045<br>1991-04    | Charpy impact test on metallic materials; part 1: test method<br><i>(withdrawn standard)</i>                           | D, M |
| DIN EN 10002-1<br>2001-12  | Metallic materials - Tensile testing - Part 1: Method of testing at ambient temperature<br><i>(withdrawn standard)</i> | D, M |
| DIN EN 10002-5<br>1992-02  | Tensile testing of metallic materials; method of testing at elevated temperature<br><i>(withdrawn standard)</i>        | D, M |
| DIN EN ISO 9017<br>2013-12 | Destructive tests on welds in metallic materials - Fracture test   | D, M |

**3 Metallographic Examinations**

|                        |  |      |
|------------------------|--|------|
| DIN EN 1321<br>1996-12 | Destructive tests of welds in metallic materials - Macroscopic and microscopic examination of welds<br><i>(withdrawn document)</i> | D, M |
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| DIN EN ISO 643<br>2013-05   | Steels - Micrographic determination of the apparent grain size   | D, M |
| DIN EN ISO 17639<br>2013-12 | Destructive tests on welds in metallic materials - Macroscopic and microscopic examination of welds  | D, M |
| ASTM E 562<br>2011          | Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count  | D, M |
| ASTM E 112<br>2013          | Standard Test Methods for Determining Average Grain Size   | D, M |
| DIN 50602<br>1985-09        | Metallographic examination - microscopic examination of special steels using standard diagrams to assess the content of non-metallic inclusions<br><i>(withdrawn standard)</i> | D, M |
| DIN EN ISO 945-1<br>2010-09 | Microstructure of cast irons - Part 1: Graphite classification by visual analysis  | D, M |
| ISO 4968<br>1979-11         | Steel - Macrographic examination by sulfur print (Baumann method)  | D, M |
| DIN EN 10247<br>2007-07     | Micrographic examination of the non-metallic inclusion content of steels using standard pictures   | D, M |

**4 Corrosion tests**

|  |  |   |
|--|--|---|
| ASTM A 262<br>2015                         | Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels<br><i>(here: only method E)</i>   | M |
| ASTM A 923<br>2014                         | Standard Test Methods for Detecting Detrimental Intermetallic Phase in Duplex Austenitic/Ferritic Stainless Steels   | M |
| DIN EN ISO 3651-2<br>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 | M |
| ASTM G 28-02a<br>2002<br>(reapproved 2015) | Standard Test Methods for Detecting Susceptibility to Intergranular Corrosion in Austenitic Stainless Steels<br><i>(here: only method A)</i>   | M |

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|--|---|---|
| ASTM G 48<br>2011<br>(reapproved 2015) | Standard Test Methods for Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys by Use of Ferric Chloride Solution<br>(here: <i>only method A</i> ) | M |
|--|---|---|

**5 Spectroscopic analysis**

|                  |  |   |
|------------------|--|---|
| AA 12<br>2015-09 | Visual electric sparks emission spectroscopy (OES)- Stationär- Fe- und Ni-Matrix Elemente: C, Cr, Cu, Mn, Mo, Ni, P, S, Si, N, Co, Nb, V, Al, Ti, Nb | M |
|------------------|--|---|

|                  |  |   |
|------------------|--|---|
| AA 13<br>2015-09 | Visual electric sparks emission spectroscopy (OES) -mobile- Fe- Matrix Elemente: C, Cr, Cu, Mn, Mo, Ni, P, S, Si, N, Co, Nb, V, Al, Nb | M |
|------------------|--|---|

**Abbreviations used:**

|       |   |
|-------|---|
| AA    | Work procedure  |
| AD HP | Working group of pressure vessels - Production and testing  |
| API   | American Petroleum Institute  |
| ASTM  | American Society for Testing and Materials  |
| ASME  | American Society of Mechanical Engineers  |
| DIN   | Deutsches Institut für Normung  |
| DNV   | Det Norske Veritas  |
| EN    | European Standard   |
| ISO   | International Organization for Standardization  |
| MT    | Magnetic particle testing   |
| PT    | Penetration testing   |
| RCC-M | Rules of French society for design and construction and in-service inspection rules for nuclear islands (afcen) |
| RT    | Radiographic testing  |
| SEL   | Steel-Iron Terms of delivery of the Association of German Steel manufactures                                    |
| SEP   | Steel-Iron Testing Guidelines of the Association of German Steel manufactures                                   |
| UT    | Ultrasonic testing  |
| VT    | Visual testing  |