

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

| | | |
|--|---|---|
|  <p>0366</p> <p>Accredited to ISO/IEC 17025:2017</p> | <p>Rotech Laboratories Ltd</p> <p>Issue No: 042 Issue date: 21 January 2021</p> | |
| | <p>Moxley Industrial Centre Western Way Wednesbury WS10 7BG United Kingdom</p> | <p>Contact: Mr Stuart Smith Tel: +44 (0)121-505 4050 Fax: +44 (0)121-505 1115 E-Mail: stuartsmith@rotechlabs.co.uk Website: www.rotechlabs.co.uk</p> |
| <p>Testing performed by the Organisation at the locations specified</p> | | |

Locations covered by the organisation and their relevant activities

Laboratory locations:

| Location details | Activity | Location code |
|---|--|---------------|
| <p>Address Rotech Laboratories Ltd Western Way Wednesbury WS10 7BG</p> <p>Local contact Mr Stuart Smith</p> | <p><u>Testing</u> Chemical tests Corrosion tests Mechanical tests Metallurgical tests Weldment Tests</p> | A |
| <p>Address Rotech Laboratories Ltd Linley Lodge Laboratory Westgate Aldridge Walsall WS9 8DG</p> <p>Local contact Mr Stuart Smith</p> | <p><u>Testing</u> Corrosion tests Mechanical tests Metallurgical tests Weldment Tests</p> | B |



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DETAIL OF ACCREDITATION

| Materials/Products tested | Type of test/Properties measured/Range of measurement | Standard specifications/ Equipment/Techniques used | Location Code |
|---|---|---|---------------|
| METALS, ALLOYS and METAL PRODUCTS | <u>Chemical Tests</u> | | |
| Aluminium alloys | Elemental analysis Si, Fe, Mn, Cu, Mg, Zn, Cr, Pb, Sn, Ti | Documented In-House Method RP101 using Optical Emission Spectroscopy | A |
| Aluminium alloys (Wrought) | Elemental analysis Si, Fe, Cu, Mn, Mg, Cr, Ni, Zn, Ti, Pb, Sn, Zr, V, Ga, Bi | Documented In-House Methods RP116 & RP117 using ICP-OES | A |
| Ferrous Based Alloys | Elemental analysis Mn, Si, P, Cu, Ni, Cr, Mo, V, Ti, Al, Nb, B | Documented In-House Methods RP116 & RP-117 using ICP-OES | A |
| Ferrous Based Alloys | Elemental analysis C, Mn, Si, S, P, Cu, Ni, Cr, Mo, Sn, Nb, V, Al, Ti, B, Zr, Pb, W, Co, Mg, N | Documented In-House Method RP101 using Optical Emission Spectroscopy | A |
| Nickel Alloys | Elemental analysis C, Si, Mn, P, S, Cr, Mo, Ni, Al, Co, Cu, B, Ti, W, V, Nb, Fe, Ta, Zr | Documented In-House Method RP101 using Optical Emission Spectroscopy | A |
| | Determination of Carbon and Sulphur | Documented In-House Method RP138 | A |
| Cast iron, copper alloys, ferro alloys, high alloyed steels, low alloyed steels, nickel and cobalt alloys, plain carbon steels and refractories | Qualitative and Semi-Quantitative analysis of elements above atomic No.5 | Documented In-House Method RP362 using Energy Dispersive Spectroscopy | A |
| High alloyed steels, low alloyed steels, nickel and cobalt alloys, plain carbon steels. | Determination of Nitrogen | Documented In-House Method RP136 | A |



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| METALS, ALLOYS and METAL PRODUCTS (cont'd) | <u>Corrosion Tests</u> | | |
| Austenitic stainless steels | Susceptibility to intergranular corrosion | ASTM A262-15 (Practice A, C & E) | A |
| Stainless Steels & related alloys | Pitting and Crevice Corrosion | ASTM G48-11(15) Method A | A |
| Wrought nickel rich chromium bearing alloys | Susceptibility to intergranular corrosion | ASTM G28-02(15) Method A | A |
| Austenitic stainless steels | Susceptibility to intergranular corrosion | ASTM A262-15 Practice E | B |
| Stainless Steels & related alloys | Pitting and Crevice Corrosion | ASTM G48-11(15) Method A | B |
| | <u>Mechanical Tests</u> | | |
| | Bend | BS EN ISO 7438:2016 | A, B |
| | Hardness: | | |
| | Brinell (5/750, 10/3000) | BS EN ISO 6506-1:2014 ASTM E10:18 | A |
| | Rockwell Scales B & C | BS EN ISO 6508-1:2016 ASTM E18-20 | A, B |
| | Vickers HV5, HV10 | BS EN ISO 6507-1:2018 ASTM E92-17 | A |
| | Vickers HV1, HV5, HV10 | BS EN ISO 6507-1:2018 ASTM E92-17 | B |
| | Low Force Vickers HV0.3, 0.5 and 1 | BS EN ISO 6507-1:2018 | A |
| | Micro Hardness HV 0.10 | ASTM E384-17 | A |



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| METALS, ALLOYS and METAL PRODUCTS (cont'd) | <u>Mechanical Tests</u> (cont'd) | | |
| | Impact: | | |
| | Izod | BS 131:Part 1:1961(2015) | A |
| | Charpy (V-notch) (-196°C and -140°C to ambient) Including %Shear and Lateral Expansion | BS EN ISO 148-1:2016 ASTM A370-19 ^{e1} ASTM E23-18 ASTM A923:2014 Method B | A |
| | Charpy (V-notch) (-196°C and -140°C to ambient) Including %Shear and Lateral Expansion | ASTM A370-19 ^{e1} ASTM E23-18 ASTM A923:2014 Method B | B |
| | Crystallinity | BS 131:Part 5:1965(2015) | A |
| | Tensile (Ambient temperature, forces from 2 kN to 600 kN) | BS EN ISO 6892-1:2019 Methods A & B BS EN 2002-1:2005 ASTM E8/8M-16a ^{e1} ASTM A370-19 ^{e1} ASTM B557/B557M-15 | A |
| Tensile (Ambient temperature, forces from 2 kN to 600 kN) | BS EN ISO 6892-1:2019 Methods A & B ASTM E8/8M-16a ^{e1} ASTM A370-19 ^{e1} | B | |
| Tensile (temperature from ambient to 600°C, forces from 2 kN to 100 kN) | BS EN ISO 6892-2:2018 Method A ASTM E21-17 ^{e1} | A | |
| Pipes and tubes | Crush, Flattening and Expanding | BS EN ISO 8492:2013 BS EN ISO 8493:2004 BS EN ISO 8495:2013 BS 6323:Part 1:1982(1990) (Superseded) ASTM A370-19 ^{e1} | A |



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| METALS, ALLOYS and METAL PRODUCTS (cont'd) | <u>Mechanical Tests</u> (cont'd) | | |
| Fasteners (Including Bolts, Screws and Nuts) | Proof Load and Tension | BS 4395:Part 1:1969 (withdrawn) BS 4395:Part 2:1969 (withdrawn) BS EN ISO 898-1:2013 BS EN ISO 898-2:2012 BS EN ISO 898-6:1996 (Withdrawn) BS EN ISO 3506-1:2020 BS EN ISO 3506-2:2020 ASTM F606/F606M-19 ASTM F738-02(2008) (Withdrawn) ASTM A370-19 ^{e1} | A |
| | Partial decarburization depth | BS EN ISO 898-1:2013 ASTM F2328-17 | A |
| METALS, ALLOYS and METAL PRODUCTS | <u>Metallurgical Tests</u> | | |
| | Case depth (Surface Hardened Layers) | BS 6286:1982(2005) ISO 4970:1979 BS EN ISO 2639:2002 BS EN 10328:2005 | A |
| | Depth of Decarburisation | BS EN ISO 3887:2018 | A |
| | Dezincification | BS EN ISO 6509-1:2014 AS 2345:2006 (Appendix C) | A |
| | Average Grain size (Comparison) | BS EN ISO 643:2020 ASTM E112- 13 (Method A) | A |
| | Fractographic and microscopical examination | Documented In-House Method RP 361 | A |
| | Inclusion content | ISO 4967:2013 ASTM E45-18a (Method A only) | A |
| | Macrostructure | ASTM E381-20 ASTM A604/A604M-07(2017) | A |
| | Average Grain size (Comparison and Intercept Method) | ASTM E112-13 (Method A) | B |
| | Austenite spacing | DNVGL-RP- F112:2019 | B |



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| METALS, ALLOYS and METAL PRODUCTS (cont'd) | <u>Metallurgical Tests (cont'd)</u> | | |
| | Volume fraction | ASTM E562-19 | A, B |
| | Detrimental intermetallic phases | ASTM A923:2014 Method A | A, B |
| Fe alloys, Stainless Steels, Al alloys, Ti alloys, Ni alloys and Superalloys | Microstructures | Documented In-House Method RP 368 | A |
| Fe alloys, Stainless Steels and Al alloys | Microstructures | Documented In-House Method RP 368 | B |
| Weldments and Brazing | Tests designated in specified Welding Codes as detailed below:- | | |
| | Bend, Fracture, Hardness, Impact, Tensile, Visual examination, Macro / Micro examination | BS EN ISO 4136:2012 BS EN ISO 5173:2010+A1:2011 BS EN ISO 5178:2019 BS EN ISO 5817:2014 BS EN ISO 9015-1:2011 BS EN ISO 9015-2:2016 BS EN ISO 9016:2012 BS EN ISO 9017:2018 BS EN ISO 9018:2015 BS EN ISO 17637:2016 BS EN ISO 17639:2013 BS EN ISO 15613:2004 BS EN ISO 15614-8:2016 BS 1140:1993 BS 4871:Part 3:1985 BS 4872:Part 1:1982 BS 4872:Part 2:1976 BS EN 287:Part 1:2011 BS EN 288-9:1999 (Withdrawn) BS EN ISO 9606-2:2004 BS EN ISO 15614-1:2017+A1:2019 BS EN ISO 15614-2:2005 BS EN ISO 15620:2019 BPVC ASME IX:2019 CAP 533 BCAR Section A8-10 | A |
| | Bend, Hardness, Impact, Tensile | BPVC ASME IX:2019 | B |



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| METALS, ALLOYS and METAL PRODUCTS (cont'd) | | | |
| METALLIC COATINGS | <u>Corrosion Tests</u> | | |
| | Neutral salt spray | ASTM B117-19 BS EN ISO 9227:2017 | A |
| | <u>Metallurgical Tests</u> | | |
| | Plating | BS EN ISO 1463:2004 | A |
| | Coating mass | BS EN 10346:2015 (Annex A) BS EN 10152:2017 (Annex A) | A |
| | <u>Chemical Test</u> | | |
| Chromate treated surfaces | Presence of hexavalent chromium | Documented In-house Method RP110 | A |
| PAINT and VARNISHES | <u>Environmental Tests</u> | | |
| | Resistance to dry heat | Documented In-House Methods RP127 | A |
| | <u>Mechanical Tests</u> | | |
| | Adhesion | BS EN ISO 2409:2013 | A |
| END | | | |