

# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

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

 <p><b>UKAS</b> TESTING</p> <p>2594</p> <p>Accredited to ISO/IEC 17025:2017</p>	<p><b>R-TECH Services Ltd trading as R-TECH Materials</b></p> <p>Issue No: 030 Issue date: 26 August 2021</p>	
	<p><b>Testing House</b> Kenfig Industrial Estate Margam Port Talbot SA13 2PE</p>	<p><b>Contact: Dr A Franks</b> Tel: +44 (0)1656 748000 Fax: +44 (0)1656 670130 E-Mail: tony.franks@r-techmaterials.com Website: www.rtech-materials.com</p>
<p>Testing performed at the above address only</p>		

R-Tech Materials is accredited for a limited flexible scope that enables the laboratory to conduct accredited testing through the modification of existing test methods, inclusion of technically equivalent standard methods and inclusion of revised standard methods to activities detailed below, in accordance with their documented in-house procedure RT 08.

### DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
METALS, ALLOYS and METAL PRODUCTS	<u>Chemical Tests</u>	
Plain carbon and low alloy steels	Elemental Analysis C, Si, Mn, P, S, Cr, Mo, Ni, Al, B, Co, Cu, Nb, Sn, Ti, V, N	Documented In-House method APM03 using OES (Spectromax – X)
Plain carbon, low alloy and stainless steels	Carbon and Sulphur	Documented In-House method APM 04 using Leco CS 744 analyser
	Nitrogen	Documented In-House method APM 05 using Leco N 736 analyser
	<u>Mechanical Tests</u>	
	Tensile (Forces up to 1500 kN)	BS EN ISO 6892-1 (Method B) excluding annex G ASTM A370
	Vickers hardness (HV0.5, HV1, HV10 & HV30)	BS EN ISO 6507-1
	Charpy Impact (V-Notch) Ambient temperature	BS EN ISO 148-1



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<p>METALS, ALLOYS and METAL PRODUCTS Plain carbon, low alloy and stainless steels (cont'd)</p> <p>WELDMENTS</p> <p>Carbon steel, stainless steel &amp; stainless steel clad reinforcing bars, wire rod, wires, welded fabrics for the reinforcement of concrete, and steel bars, wire and strand for the pre-stressing of concrete</p>	<p>Tests designated in specified welding codes, as detailed below</p> <p>Bend, Fracture, Hardness, Impact, Tensile and Visual Examination</p> <p><u>Mechanical Tests</u></p> <p>Bend</p> <p>Rebend</p> <p>Reverse bend</p> <p>Fatigue (Forces up to 400 kN)</p>	<p>BS 4872-1 BS EN ISO 15614-1 BS EN ISO 5173+A1 BS EN ISO 9017 BS EN ISO 9015-1 BS EN ISO 9016 BS EN ISO 4136 BS EN ISO 17637</p> <p>BS 6744 BS EN 10080 ASTM A615/A615M ASTM A706/A706M</p> <p>BS 4482:1985 (Withdrawn) BS 4482 BS 4449:1997 (Superseded) BS 4449 + A3 BS EN ISO 15630-1 BS EN ISO 15630-2 BS EN ISO 15630-3</p> <p>ISO 7801</p> <p>BS 4449:1997 (Superseded) BS 4449 + A3 BS 6744 BS EN ISO 15630-2:2002 (withdrawn) BS EN ISO 15630-1 BS EN ISO 15630-2 BS EN ISO 15630-3</p>



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<p>METALS, ALLOYS and METAL PRODUCTS (cont'd)</p> <p>Carbon steel, stainless steel &amp; stainless steel clad reinforcing bars, wire rod, wires, welded fabrics for the reinforcement of concrete, and steel bars, wire and strand for the pre-stressing of concrete (cont'd)</p>	<p><u>Mechanical Tests</u> (cont'd)</p> <p>Tensile (Forces up to 1500 kN)</p> <p>Weld shear</p> <p><u>Dimensional Tests</u></p> <p>Determination of geometrical characteristics Indentation measurements Relative rib area Deviation from nominal mass per metre</p> <p>Determination of geometrical characteristics Relative rib area</p> <p>Effective cross sectional area Projected and relative rib area</p> <p>Measurement of Deformations</p>	<p>BS 4449:1997 (Superseded) BS 4449 +A3 BS 4482:1985 (Withdrawn) BS 4482 BS 4483:1998 (Withdrawn) BS 4483 BS 4486 BS 6744 BS EN ISO 6892-1 (Method B) excluding Annex G BS EN ISO 15630-1 BS EN ISO 15630-2 BS EN ISO 15630-3 ASTM A615/A615M ASTM A706/A706M</p> <p>BS 4483:1998 (withdrawn) BS 4483 BS EN ISO 15630-2</p> <p>BS EN ISO 15630-1 BS EN ISO 15630-2 BS EN ISO 15630-3</p> <p>BS 6744</p> <p>BS 4449:1997 (Superseded) BS 4449 + A3</p> <p>ASTM A615/A615M ASTM A706/A706M</p>



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<p>METALS, ALLOYS and METAL PRODUCTS (cont'd) Carbon steel, stainless steel &amp; stainless steel clad reinforcing bars, wire rod, wires, welded fabrics for the reinforcement of concrete, and steel bars, wire and strand for the pre-stressing of concrete (cont'd)</p> <p>Welded carbon &amp; stainless steel reinforcing bars</p>	<p><u>Metallurgical tests</u></p> <p>Macro examination</p> <p><u>Mechanical Tests</u></p> <p>Bend</p> <p>Tensile (Forces up to 1500 kN)</p> <p>Hardness survey (HV30, HV10 &amp; HV1.0)</p> <p>Weld shear (Forces up to 900 kN)</p> <p><u>Metallurgical</u> Macro examination</p>	<p>Documented In-House Method PM23</p> <p>BS EN ISO 17660-1</p> <p>BS 4449:1997 (Superseded) BS 4449 + A3 BS 6744 BS 7123:1989 (Superseded) BS EN ISO 17660-1</p> <p>BS EN ISO 9015-1 BS EN ISO 15614-1</p> <p>BS EN ISO 15630-2 BS EN ISO 17660-1</p> <p>BS 7123:1989 (Superseded) BS EN ISO 17660-1 BS EN ISO 17660-2 Documented In-House Method PM25</p>
<p>Mechanical splices, (couplers) for reinforcement of concrete</p>	<p><u>Mechanical tests</u></p> <p>Tensile (Forces up to 1500 kN)</p>	<p>BS 4449:1997 (Superseded) BS 4449 + A3 BS EN ISO 15630-1 BS 8597 Sellafield Engineering Standard ES_0_3110_2</p>



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METALS, ALLOYS and METAL PRODUCTS (cont'd)  Mechanical splices, (couplers) for reinforcement of concrete (cont'd)	<u>Mechanical tests</u>  Compression (Forces up to 1500 kN)  Cyclic tensile (Forces up to 1200 kN)  Low cycle reverse loading tests, S1, S2 and S  Fatigue (Forces up to 400 kN)  Slip test  Tensile (Temperature $\leq -7$ °C) (Forces up to 1200 kN)  Determination of permanent offset (elongation / slip)	Documented In-House Method PM51 Sellafield Engineering Standard ES_0_3110_2  Documented In-House Methods PM50 & PM 58 Sellafield Engineering standard ES0_3110_2  ISO 15835-2:2009 (superseded) ISO 15835-2  BS 8597 BS EN ISO 15630-1  BS 8597 ISO 15835-2:2009 (superseded) ISO 15835-2  Documented In-House Method PM49 Sellafield Engineering standard ES_0_3110_2  BS 8110-1:1997 (Withdrawn) Documented In-House Method PM18 & PM45 Sellafield Engineering Standard ES_0_3110_2



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METALS, ALLOYS and METAL PRODUCTS (cont'd)		
Headed anchors for reinforcing steel	Tensile (Forces up to 1500 kN)	Documented In-House Methods PM61 & PM62 Sellafield Engineering Standard ES_0_3110_2
	Load Transfer in air (tensile test)	ISO 15698-2
	Robustness Test (wedge tensile test)	ISO 15698-2
	Permanent elongation / slip in tension or compression (Forces up to 1500 kN)	Documented In-House Methods PM61 & PM62 Sellafield Engineering Standard ES_0_3110_2
Headed anchors for reinforcing steel	Tensile (Temperature $\leq -7$ °C) (Forces up to 1500 kN)	Documented In-House Method PM62 Sellafield Engineering Standard ES_0_3110_2
	Cyclic Tensile (Forces up to 1500 kN)	Documented In-House Method PM63 Sellafield Engineering Standard ES_0_3110_2
Bar, wire and strand for the pre-stressing of concrete	Modulus of elasticity (Forces up to 1000 kN)	BS EN ISO 15630-3
Strand for pre-stressing of concrete	Fatigue (Forces up to 270 kN)	BS EN ISO 15630-3



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METALS, ALLOYS and METAL PRODUCTS (cont'd)	<u>Metallurgical Tests</u>  Depth of decarburization (Hardness and microscopical)  Depth of carburized/hardened case  Average Grain Size (Heyn intercept method)  Volume Fraction  Detrimental Intermetlic Phases	BS EN ISO 3887  BS EN 10328 BS EN ISO 2639 + Corr 1  ASTM E112  ASTM E562  ASTM A923 (Method A)
PLASTICS, INCLUDING REINFORCED PLASTICS, FIBRE REINFORCED PLASTIC COMPOSITES, LAMINATES and RESINS	<u>Physical Tests</u>  Glass Content  Resin, Fibre and Void Content  Density and Specific Gravity (Relative Density)  Water absorption  <u>Thermal Properties Analysis</u>  Glass transition temperature by dynamic mechanical analysis (DMA)  Coefficient of thermal expansion by thermomechanical analysis (TMA)	BS EN ISO 1172 Method A  BS ISO 14127 Procedure A3  ASTM D792  BS EN ISO 62  BS ISO 11357 ASTM D7028  BS ISO 11359-1 BS ISO 11359-2 ASTM E831



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PLASTICS, INCLUDING REINFORCED PLASTICS, FIBRE REINFORCED PLASTIC COMPOSITES, LAMINATES and RESINS (cont'd)	<p><u>Mechanical Tests</u> <u>(Performed in an environment of controlled temperature and relative humidity)</u></p> <p>Tensile properties (Forces up to 250 kN)</p> <p>Shear properties V-Notched Rail Shear Method</p> <p>Shear properties V-Notched Beam Method</p> <p>Apparent interlaminar shear strength (Forces up to 10 KN)</p> <p>Barcol hardness</p> <p>Compressive properties (Forces up to 250 KN)</p> <p>Compressive modulus and strength</p> <p>Determination of heat deflection temperature</p> <p>Flexural properties (Forces up to 10 kN &amp; 100 kN)</p> <p>In-plane shear strength at 5%/shear strain/shear modulus by tensile test of a ±45° laminate (Forces up to 250 kN)</p>	<p>BS EN ISO 527-2 BS EN ISO 527-4 BS EN ISO 527-5 ASTM D638 ASTM D3039/D3039M</p> <p>ASTM D7078/D7078M</p> <p>ASTM D5379/D5379M</p> <p>BS EN ISO 14130 ASTM D2344/D2344M</p> <p>BS 2782-10: Method1001:1977 (Withdrawn)</p> <p>BS EN ISO 604 ASTM D6641/D6641M</p> <p>BS EN ISO 14126 + Corr 1 prEN 2850: Ed P2 SACMA SRM 1R-94</p> <p>BS EN ISO 75-1 BS EN ISO 75-2</p> <p>BS EN ISO 178 + A1 BS EN ISO 14125 + A1 ASTM D790</p> <p>BS EN ISO 14129 ASTM D3518/D3518M</p>





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PLASTICS, INCLUDING REINFORCED PLASTICS, FIBRE REINFORCED PLASTIC COMPOSITES, LAMINATES and RESINS (cont'd)	<u>Mechanical Tests</u> <u>(Performed in an environment of controlled temperature and relative humidity) (cont'd)</u>	
	Shore D hardness	BS EN ISO 868 AMD 14577 ASTM D2240 Using a Durometer
FIBRE REINFORCED RIGID PLASTIC	Compression	ASTM D695
ADHESIVES	<u>Mechanical Tests</u> <u>(Performed in an environment of controlled temperature and relative humidity) – cont'd</u>	
	Lap shear strength of rigid-to-rigid bonded assemblies (Forces up to 250 kN)	ISO 4587
	Climbing drum peel (Forces up to 10 kN)	ASTM D1781
	Core shear properties of sandwich constructions by beam flexure (Forces up to 250 kN)	ASTM C393/C393M
	Compression – foam / composite sandwich (Forces up to 10 kN)	ASTM D1621
Sandwich Construction (Core)	Flatwise Tensile	ASTM C297/C297M



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<p><b>FLEXIBLE SCOPE CONSTRAINTS</b></p> <p>ENGINEERING and STRUCTURAL COMPONENTS, PRODUCTS, FIXINGS, WELDMENTS AND RIGID PLASTICS, FIBRE REINFORCED POLYMERIC MATERIALS, PLUMBING ITEMS, ITEMS IN CONTACT WITH THE WATER DISTRIBUTION NETWORK</p>	<p>Tensile &amp; compressive forces, Fatigue, Displacement, Bending, Hardness, Metallurgy, Physical properties (Polymers and composites), Dimensional measurement, Elemental analysis.</p> <ul style="list-style-type: none"><li>• Forces up to <math>\pm 1500</math> kN</li><li>• Forces up to <math>\pm 250</math> kN (Polymers &amp; Composites)</li><li>• Fatigue <math>\pm 400</math> kN</li><li>• Dimensional (within calibrated limits of the optical projector and measuring instruments)</li><li>• Hardness (Vickers &amp; Barcol)</li></ul>	<p>Documented In-House Methods developed using procedure RT 8</p>



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<p>PLUMBING ITEMS. ITEMS IN CONTACT WITH THE WATER DISTRIBUTION NETWORK</p> <p>Taps, valves, float operated valves, plug cocks, ferrules, water heaters, water meters and plumbing fittings for use with tube/pipe.</p> <p>Draw-off taps, compression type fittings for tube/pipe</p> <p>Compression type fittings for tube/pipe</p> <p>All water fittings</p>	<p>Mechanical, Physical tests and examination of water fittings wicH are subject to the UK regualtions scheme</p> <p>Closure</p> <p>Porosity</p> <p>Joint Effectiveness</p> <p>Torque – Operating Mechnism</p> <p>Torque – Connection &amp; Disconnection</p> <p>Torque – Backnuts</p> <p>Tension - Single pull (Pull out of assembled joint)</p> <p>Tension – Multiple pull (Pull out of assembled joint)</p> <p>Corrosion Protection</p> <p>Means for Connection &amp; Disconnection</p> <p>Visual Inspection Seal to be readily renewable</p> <p>Visual Inspection Fixing of washer plate</p>	<p>Methods documented in the Water Regualtions Advisory Scheme</p> <p>Test Code Sheets</p> <p>1111.1 1111.2</p> <p>1112.1</p> <p>1113.1 1113.2</p> <p>1315.1</p> <p>1315.2</p> <p>1315.4</p> <p>1314.1 1314.7 1314.9 1314.10 1314.11 1314.12 1314.13 1314.14 1314.15</p> <p>1314.8</p> <p>1412.1</p> <p>1611.5</p> <p>1611.8</p> <p>1611.9</p>



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PLUMBING ITEMS. ITEMS IN CONTACT WITH THE WATER DISTRIBUTION NETWORK (Cont'd)	Mechanical, Physical tests and examination of water fittings wich are subject to the UK regualtions scheme (cont'd)	Methods documented in the Water Regualtions Advisory Scheme (cont'd)
All water fittings (cont'd)	Visual Inspection Means of Operation	Test Code Sheets  1611.10
	Effect upon water quality (non-metallic materials)	2111.1
	Marking for identification	6001.1
	Tap Gap	2213.18 2213.19
	Linear Dimensions	5011.1
Soldered fittings in contact with potable water	Determination of the presence of Lead in solder	2111.3
END		