

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>UKAS TESTING</p> <p>0963</p> <p>Accredited to ISO/IEC 17025:2017</p>	<p>Metals Technology (Testing) Limited</p> <p>Issue No: 036 Issue date: 20 March 2020</p>	
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<p>Testing performed at the above address only</p>		

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 Analysis</u>	Documented In-House Methods using ICP-OES
Ferrous and Non-ferrous alloys including:	<u>Elemental Analysis</u>	
Stainless Steels, Manganese Steel and Tool Steel	Si, Mn, P, Cr, Ni, Mo, Sn, Ti, V, B, Ta, As, Cu, Nb, Al, Co, Pb, W, Zr	
Low Alloy	Si, Mn, P, Cr, Mo, Ni, Al, As, B, Ca, Co, Cu, Nb, Pb, Sn, Ti, V, W, Zr, Sb	
Cast Iron	Si, Mn, P, Cr, Mo, Ni, Al, Co, Cu, Mg, Nb, Pb, Sn, Ti, V, As	
Alloyed Iron	Si, Mn, P, Cr, Mo, Ni, Cu, Mg, Nb, V	
Bronzes including Lead Bronze and Aluminium Bronze	Si, Mn, Al, Fe, Mg, Ni, Pb, Sn, Zn, Co, Cu, As, Bi, S, Sb, P	
Brasses	Mn, Al, As, Cu, Fe, Pb, Sn, Si, Zn	
Copper-Nickel Alloys	Si, Mn, B, Bi, Fe, Ni, Pb, Zn Si, Mn, B, Bi, Fe, Ni, Pb, Zn	
Aluminium Base Alloys	Cu, Mg, Si, Fe, Mn, Ni, Zn, Pb, Sn, Ti, Cr, Sr, Zr, P, Be	
Titanium Base Alloys	Mn, Cr, Mo, Ni, Al, Co, Cu, Sn, Ti, V, Zr, Fe, Si, Pb, Bi	
Nickel-Copper Based Alloys	Ni, Si, Cu, Fe, Mn, Cr, Al, Ti, Co, P, Nb, Pb, Mg	



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METALS, ALLOYS and METAL PRODUCTS (cont'd)	<u>Chemical Analysis</u> (cont'd)	Documented In-House Methods using direct reading emission spectroscopy (OES)
Ferrous and Non-ferrous alloys including: (cont'd)	<u>Elemental Analysis</u> (cont'd)	
Manganese Steel, Tool Steel and Stainless Steel	C, Si, Mn, P, S, Cr, Mo, Ni, Cu, Al, As, B, Co, Nb, Sn, Ti, V, W, N	
Low Alloy Steel	C, Si, Mn, P, S, Cr, Mo, Ni, Cu, Al, As, B, Co, Nb, Sn, Ti, V, W, N, Ca, Zr, Sb, Pb	
Cast Irons	C, Si, Mn, P, S, Cr, Mo, Ni, Cu, Al, As, B, Ce, Co, Mg, Nb, Pb, Sb, V, W, Zn, Zr	
Alloyed Irons	C, Si, Mn, P, S, Cr, Mo, Ni, Cu, Al, Mg	
Nickel Based Alloys	Ni, C, Si, Cu, Fe, Mn, Cr, Ti, Al, Co, Mo, Mg, W, Nb, P, S, V	
Nickel-Copper Based Alloys	Ni, C, Si, Cu, Fe, Mn, Cr, Al, Ti, Co, P, S, Nb	
Cobalt Alloys	Co, Fe, C, Si, Mn, Cr, Ni, Al, Nb, W, S, Mo, Cu	
Brasses	Cu, Sn, Zn, Fe, Ni, Al, Si, As, Mn, Bi, Sb, P, Pb	
Bronzes	Cu, Sn, Zn, Fe, Ni, Al, Si, As, Mn, Bi, Sb, P, Cr, S, Mg, Pb, Co	
Copper-Nickel Alloys	Cu, Fe, Ni, Si, Mn, S, Mg, Pb, Co, C, P, Cr, Al, Nb, Zr, As, Bi, Sb, Zn	
Aluminium Alloys	Al, Cu, Mg, Si, Fe, Mn, Ni, Zn, Pb, Sn, Ti, Cr, Zr, P	



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METALS, ALLOYS and METAL PRODUCTS (cont'd)	<u>Chemical Analysis</u> (cont'd)	Documented In-House Methods using Direct Reading Emission Spectroscopy and ICP-OES (cont'd)
Ferrous and Non-ferrous alloys including: (cont'd)	<u>Elemental Analysis</u> (cont'd)	
Aluminium Base Alloys	Cu, Mg, Si, Fe, Mn, Ni, Zn, Pb, Sn, Ti, Cr, Sr, Zr, P, Be	
Aluminium Bronze	Cu, Sn, Zn, Pb, Ni, Fe, Al, Mn, Si, Co, Mg	
Nickel Base Alloys	Ni, C, Si, Mn, P, S, Cu, Fe, Cr, Ti, Al, Co, Mo, Mg, W, Nb, V	
Nickel-Copper Base Alloys	Ni, C, Si, Cu, Fe, Mn, Cr, Al, Ti, Co, P, S, Nb	
Titanium Base Alloys	Mn, Cr, Mo, Ni, Al, Co, Cu, Sn, Ti, V, Zr, Fe, Si, Pb, Bi	



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METALS, ALLOYS and METAL PRODUCTS (cont'd)	<u>Chemical Analysis</u> (cont'd)	
Ferrous and Non-ferrous metals and alloys	Carbon and Sulphur content Oxygen content of Solid Nitrogen Content	Documented In-House Methods using Leco Oxygen fusion
Hydrogen analysis	Steels (low alloy stainless) by hot extraction Titanium & titanium alloys by inert gas fusion	Documented In-House Methods using Leco RH402
	<u>Mechanical Tests</u>	
	Tensile (ambient temperature) (forces 5 kN to 500 kN)	BS EN ISO 6892-1: 2016 ASTM E8/E8M-16a ASTM A370-19
	Tensile (temperatures up to 650°C) (forces 5 kN to 500 kN)	BS EN ISO 6892-2:2018 ASTM E21-17
	Impact: Charpy 'V' & "U" notch (-196°C and -130°C to ambient) Lateral expansion and % Shear	BS EN ISO 148-1:2016 ASTM E23-18 ASTM A370-19
	Izod	BS 131:Part 1:1961(2007)
	Hardness:	
	Brinell HBW 10\3000	BS EN ISO 6506-1:2014 ASTM E10-18 ASTM A370-19
	Rockwell B and C	BS EN ISO 6508-1:2016 ASTM E18-19 ASTM A370-19
	Vickers (HV10 & HV30)	BS EN ISO 6507-1:2018
	Bend	BS EN ISO 7438:2016



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METALS, ALLOYS and METAL PRODUCTS (cont'd)	<u>Metallurgical Tests</u> Decarburisation depth by microscopical methods Inclusion content Grain size Macro-etch examination Sulphur print Volume fraction	ASTM E1077-14 ASTM E45-18a ISO 4967:2013 ASTM E112-13 BS EN ISO 643:2012 ASTM E1181-02(15) ASTM E930-18 ASTM E381-17 ASTM A604/A604M-07(2017) API 6A718 2 nd Edition ASTM E1180-08(2014) ASTM E562-19
Stainless Steels	<u>Corrosion Tests</u> Pitting and crevice corrosion resistance Detecting Detrimental Intermetallic Phases (Duplex stainless steels) Intercrystalline corrosion	ASTM G48-11(2015) (Methods A & B) ASTM A923-14, Method C ASTM A262-15 Methods A, B, C and E BS EN ISO 3651-1:1998 Method A, B and C BS EN ISO 3651-2:1998
Nickel Alloys	Intercrystalline corrosion	BS EN ISO 9400:1996 Method A, B, C and D ASTM G28-02(2015) Method A



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FERROUS and NON-FERROUS CASTINGS, FORGINGS, PLATE, WELDMENTS	<u>Mechanical and Metallurgical Tests</u> Tests designated in specified welding codes as detailed below: Bend, Fracture, Hardness, Impact, Tensile, Macro-examination	BS EN ISO 17637:2016 BS EN ISO 17639:2013 BS EN ISO 4136:2012 BS EN ISO 5173:2010 + A1(2011) BS EN ISO 5178:2019 BS EN ISO 9015-1:2011 BS EN ISO 9016:2012 BS 4872-1:1982 BS 4872-2:1976 BS EN ISO 9606-1:2017 BS EN ISO 15614-1:2017 BS EN ISO 15614-2:2005 ASME IX:2019
END		