

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

 <p>Accredited to ISO/IEC 17025:2005</p>	<h3>Metals Technology (Testing) Limited</h3>	
	<p>Issue No: 022 Issue date: 11 February 2010</p>	<p>Contact: Mr. R White Tel: +44 (0)114-2437271 Fax: +44 (0)114-2437288 E-Mail: office@metalstechnology.co.uk Website: www.metalstechnology.co.uk</p>
<p>6 Finchwell Close Handsworth Sheffield South Yorkshire S13 9DF</p>	<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 Ferrous and Non-ferrous alloys including: Manganese Steel, Tool Steel, General Steel & Low Alloy Cast Iron Alloyed Iron Resulphurised Low Alloy Resulphurised Stainless Copper Base Alloys Copper-Nickel Alloys Aluminium base Alloys Nickel base Alloys	<u>Chemical Analysis</u> Elemental Analysis Fe, C, Si, Mn, P, S, Cr, Mo, Ni, Al, As, B, Ca, Co, Cu, Nb, Pb, Sn, Ti, V, W, Zr, N ₂ Fe, C, Si, Mn, P, S, Cr, Mo, Ni, Al, B, As, Co, Cu, Mg, Nb, Pb, Sn, Ti, V, W, Ce, N ₂ Fe, C, Si, Mn, P, S, Cr, Mo, Ni, Cu, Mg, Nb, V Fe, C, Si, Mn, P, S, Cr, Mo, Ni, Cu, Al, Pb Fe, C, Si, Mn, P, S, Cr, Mo, Ni, Cu, Nb, Ti, Al Cu, Sn, Zn, Fe, Ni, Al, Si, As, Mn, Bi, Sb, P, Pb, Co, Mg, S, Cr Cu, Fe, Ni, Si, Mn, S, Mg, Pb, Co, C, P, Cr, Al, Nb, Zr, As, Bi, Sb, Zn Al, Cu, Mg, Si, Fe, Mn, Ni, Zn, Pb, Sn, Ti, Cr, V, P Ni, C, Si, Mn, P, S, Cu, Fe, Cr, Ti, Al, Co, Mo, Mg, W, Nb, V	Documented In-House Methods using Direct Reading Emission Spectroscopy



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METALS, ALLOYS and METAL PRODUCTS	<u>Chemical Analysis</u> (cont'd)	Documented In-House Methods using Direct Reading Emission Spectroscopy (cont'd)
Nickel-Copper base Alloys	Elemental Analysis Ni, C, Si, Cu, Fe, Mn, Cr, Al, Ti, Co, P, S, Nb	
Iron Base Alloys	Elemental Analysis Al, Sb, As, Ba, Bi, B, Ca, Cd, Cr, Cu, Co, Fe, Pb, Mg, Mn, Mo, Ni, Nb, P, Si, Na, Ta, Te, Sn, Ti, W, V, Zn, Zr, O&M Non-Magnetics	Documented In-House Methods using:- Atomic Absorption Spectrophotometry, Visible light Spectrophotometry and Volumetric techniques
Magnesium Base Alloys	Al, Sb, As, Bi, Ca, Cr, Cu, Co, Fe, Pb, Mn, Mo, Ni, Nb, P, Si, Sn, Ti, W, V, Zn, Rare Earths	
Nickel Base Alloys	Al, Sb, As, Ba, Bi, B, Ca, Cr, Cu, Co, Fe, Pb, Mg, Mn, Mo, Ni, Nb, P, Si, Ta, Sn, Ti, W, V, Zn, Zr	
Aluminium Base Alloys	Al, Sb, As, Bi, Be, Ca, Cr, Cu, Co, Fe, Pb, Li, Mg, Mn, Mo, Ni, Nb, P, Si, Na, Te, Sn, Sr, Ti, V, Zn,, Zr	
Zinc Base Alloys	Al, Sb, As, Bi, Ca, Cr, Cu, Co, In, Fe, Pb, Mg, Mn, Mo, Ni, Nb, P, Si, Sn, Ti, W, V, Zn, Zr	
Copper Base Alloys	Al, Sb, As, Be, Bi, B, Cd, Ca, Cr, Cu, Co, Fe, Pb, Mg, Mn, Mo, Ni, Nb, P, Si, Ag, Te, Sn, Ti, W, V, Zn, Zr	
Cobalt Base	Al, Sb, As, B, Ca, Cr, Cu, Co, Fe, Pb, Mg, Mn, Mo, Ni, Nb, P, Si, Sn, Ta, Ti, W, V, Zn, Zr	
Titanium Base	Al, Sb, As, Ca, Cr, Cu, Co, Fe, Pb, Mg, Mn, Mo, Ni, Nb, P, Si, Sn, Ti, W, V, Zn, Zr	



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METALS, ALLOYS and METAL PRODUCTS	<u>Chemical Analysis</u> (cont'd) Elemental Analysis	Documented In-House Methods using:- Atomic Absorption Spectrophotometry, Visible light Spectrophotometry and Volumetric techniques
Ferro Alloys	Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Cr, Cu, Co, In, Fe, Pb, Mg, Mn, Mo, Ni, Nb, P, Si, Na, Sr, Ta, Te, Sn, Ti, W, V, Zn, Zr	
Ferrous and Non-ferrous metals and alloys Ferroalloys	Carbon and Sulphur content Oxygen content of Solid Nitrogen Content <u>Mechanical Testing</u> Tensile in temperature range ambient to 900°C (forces 5 kN to 500 kN) Impact: Charpy 'V' notch at -196°C and in the temperature range -80°C to ambient Izod Hardness: Brinell 10\3000 Rockwell B and C Vickers (HV10 & HV30) Bend	Documented In-House Methods using Leco Oxygen fusion BS EN 10002-1:2001 BS EN 10002-5:1992 ASTM E8/E8M-08 ASTM E21- 09 ASTM A370-09a BS EN 10045-1:1990 ASTM E23- 07a ^{ε1} ASTM A370-09a BS 131:Part 1:1961(1996) BS EN ISO 6506-1:1999 (superseded) ASTM E10-08 ASTM A370-09a BS EN ISO 6508-1:1999 (superseded) ASTM E18- 08b ASTM A370-09a BS EN ISO 6507-1:1998 (superseded) BS EN ISO 7438:2005



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METALS, ALLOYS and METAL PRODUCTS (continued)	<u>Metallurgical Tests</u>	
	Decarburisation depth	Documented In-House Method
	Inclusion content	ASTM E45-05 ^{ε1} ISO 4967 :1998
	Grain size	ASTM E112-96(04) ^{ε2} BS EN ISO 643:2003
	Macro-etch examination	Documented In-House Method OP9
	Sulphur print	Documented In-House Method OP8
	Volume fraction	ASTM E562-05 ^{ε1}
Stainless Steels	<u>Corrosion Tests</u>	
	Pitting and crevice corrosion resistance	ASTM G48-03 (09) (Methods A & B)
	Intercrystalline corrosion	ASTM A262-02ae3, Methods A to E BS EN ISO 9400:1996 ASTM G28-02(08) BS EN ISO 3651-1:1998 BS EN ISO 3651-2:1998
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, Visual examination, Macro-examination	BS 4872-1:1982 BS 4872-2:1976 BS EN 287-1:2004 BS EN 875:1995 BS EN 876:1995 BS EN 895:1995 BS EN 910:1996 BS EN 970:1997 BS EN 1043-1:1996 BS EN 1321:1997 BS EN ISO 15614-1:2004 BS EN ISO 15614-2:2005 ASME IX:2007

END