Certificate of Accreditation

UKAS
United Kingdom Accreditation Service

Howmet Ltd

Testing Laboratory No. 0142

Is accredited in accordance with International Standard ISO/IEC 17025:2017 – General Requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope specified in the schedule to this certificate, and the operation of a management system (refer joint ISO-ILAC-IAF Communiqué dated April 2017). The schedule to this certificate is an essential accreditation document and from time to time may be revised and reissued.

The most recent issue of the schedule of accreditation, which bears the same accreditation number as this certificate, is available from www.ukas.com.

This accreditation is subject to continuing conformity with United Kingdom Accreditation Service requirements.

Matt Gantley, *Chief Executive Officer*
United Kingdom Accreditation Service

Initial Accreditation: 1 May 1982
Certificate Issued: 25 January 2021

ilac-MRA

UKAS
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UKAS is appointed as the sole national accreditation body for the UK by The Accreditation Regulations 2009 (SI No 3155/2009) and operates under a Memorandum of Understanding (MoU) with the Department for Business, Energy and Industrial Strategy (BEIS).

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

0142

Accredited to ISO/IEC 17025:2017

Howmet Ltd

Issue No: 036 **Issue date:** 25 February 2025

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Testing performed at the above address only

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
NICKEL BASE ALLOYS	<u>Chemical Tests</u> Elemental analysis Aluminium Chromium Cobalt Copper Hafnium Iron Manganese Molybdenum Nickel Niobium Palladium Phosphorus Platinum Rhenium Ruthenium Silicon Tantalum Titanium Tungsten Vanadium Yttrium Zirconium Cerium Silicon Phosphorus Boron Lanthanum Calcium Magnesium Aluminium	Documented In-House Methods from Materials Control Laboratory Manual (MCLM) using: XRFS (294) XRFS (298) XRFS (298) Spark OES (301)

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
NICKEL BASE ALLOYS (cont'd)	Chemical Tests (cont'd) Elemental analysis (cont'd) Carbon Sulphur Nitrogen Oxygen Lithium Beryllium Magnesium Phosphorus Sulfur Chlorine Calcium Scandium Manganese Copper Zinc Gallium Germanium Arsenic Bromine Selenium Rubidium Yttrium Rhodium Palladium Silver Indium Tin Antimony Iodine Tellurium Cesium Lanthanum Cerium Praseodymium Neodymium Samarium Europium Gadolinium Terbium Dysprosium	 Combustion and Infra-Red Absorption (300) Inert Gas Fusion (299) Glow Discharge Mass Spectrometry (303)

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
NICKEL BASE ALLOYS (cont'd)	Chemical Tests (cont'd) Elemental analysis (cont'd) Holmium Erbium Thulium Ytterbium Lutetium Rhenium Osmium Iridium Platinum Gold Mercury Thallium Lead Bismuth Thorium Uranium Potassium Ruthenium Cadmium	Glow Discharge Mass Spectrometry (303)

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
COBALT BASE ALLOYS	Chemical Tests	
	Elemental analysis	
	Aluminium	XRFS (294)
	Chromium	XRFS (298)
	Cobalt	
	Copper	
	Hafnium	
	Iron	
	Lanthanum	
	Manganese	
	Molybdenum	
	Nickel	
	Niobium	
	Phosphorus	
	Platinum	
	Potassium	
	Rhenium	
	Silicon	
	Tantalum	
	Titanium	
	Tungsten	
	Vanadium	
	Yttrium	
	Zirconium	
	Carbon	Combustion and Infra-Red
	Sulphur	Absorption (295) (300)
	Nitrogen	Inert Gas Fusion (299)
	Oxygen	

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
IRON BASE ALLOYS	<u>Chemical Tests</u>	
	Elemental analysis	
	Aluminium	XRFS (294)
	Cerium	XRFS (298)
	Chromium	
	Cobalt	
	Copper	
	Iron	
	Manganese	
	Molybdenum	
	Niobium	
	Phosphorus	
	Silicon	
	Tantalum	
	Tin	
	Titanium	
	Tungsten	
	Vanadium	
	Zirconium	
	Carbon	Combustion and Infra-Red
	Sulphur	Absorption (300)
	Nitrogen	Inert Gas Fusion (299)
	Oxygen	

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
METALS, ALLOYS AND METAL PRODUCTS	<u>Mechanical Tests</u>	
	Vickers Hardness (HV 30)	BS EN ISO 6507-1:2023 ASTM E92 - 23
	Rockwell Hardness (HRC)	BS EN ISO 6508-1:2023 ASTM E18-24
	Stress Rupture (700°C -1050°C)	BS EN 2002-005:2007 ASTM E139-11(2018) BS EN ISO 204:2023
	Tensile tests Ambient Temperature (Range 0.1 - 50kN)	BS EN ISO 6892-1:2019 ASTM E8/E8M-2024
	Elevated Temperature (650 °C and 850 °C)	BS EN 2002-2:2005 BS EN ISO 6892-2:2018 ASTM E21-20
	Excluding the determination of Young's Modulus	
END		