

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>UKAS TESTING 1765</p> <p>Accredited to ISO/IEC 17025:2017</p>	<p>Alfred H Knight Energy Services Ltd</p> <p>Issue No: 053 Issue date: 18 December 2024</p>	
	<p>Unit 1 Palmermount Industrial Estate Bypass Road Dundonald Kilmarnock Ayrshire KA2 9BL</p>	<p>Contact: Mr John Watt Tel: +44 (0)1563 850375 E-Mail: john.watt@ahkgroup.com Website: www.ahkgroup.com</p>
<p>Testing performed by the Organisation at the locations specified below</p>		

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
<p>Address Unit 1 Palmermount Industrial Estate Bypass Road Dundonald Kilmarnock Ayrshire KA2 9BL</p> <p>Local contact Mr John Watt Tel: +44 (0)1563 850375 Email: john.watt@ahkgroup.com Website: www.ahkgroup.com</p>	Fuels - Chemical and Physical Tests	A
<p>Address Units B3 - B4 Olympic Business Park Dundonald Kilmarnock Ayrshire KA2 9BE</p> <p>Local contact Mr John Watt Tel: +44 (0)1563 850375 Email: john.watt@ahkgroup.com Website: www.ahkgroup.com</p>	Fuels - Chemical and Physical Tests	B
<p>Address LMA cv Oeverkruid 14 4941 VV Raamsdonksveer Netherlands</p> <p>Local contact Mr Rutger Jan Hoeven Tel: +31 (0)183 307050 Email: rutger.hoeven@ahkgroup.com</p>	Fuels - Chemical and Physical Tests Sample Preparation of Coal, Coke, and Solid Biofuels	C
<p>Address Temple House Unit 1, Fairfield Park Manvers Way Wath upon Dearne Rotherham S63 5DB</p> <p>Local contact Ms Clare Gittins Tel: +44(0) 1709 871 315 E-Mail: clare.gittins@ahkgroup.com Website: www.ahkgroup.com</p>	Sampling and Sample Preparation of Solid Recovered Fuels and Refuse Derived Fuels	D



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Site activities performed away from the locations listed above:

Location details	Activity	Location code
Premises away from the main Laboratories	Fuels – Sampling Sampling of Solid Recovered Fuels and Refuse Derived Fuels	E



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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
COAL, COKE	<u>Chemical and Physical Tests</u>		
	Sampling	Documented In-House Method KES/93/Prep-C conforming to: BS ISO 18283:2022 ASTM D2234 (location E)	A, B, E
	Sample Preparation	Documented In-House Method LMA/93/Prep-C conforming to: BS ISO 18283:2022 ASTM D2013 (location B)	B,
	Hardgrove Grindability Index (HGI)	Documented In-House Method SM041 (using Hardgrove Machine) based on: BS ISO 5074:2015; and ASTM D409:2016	A,
	Free Swelling Index (Crucible Swelling Number)	Documented In-house Method SM010 based BS ISO 501:2012	A
	Total Moisture	Documented In-House Method based on ASTM D3302:2022	A, B
COAL	Analysis Moisture	Documented In-House Method based on ASTM D3173:2021	A
	Trace Elements: As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, Se, Ti, V, Zn, B, Ti, U, Sn, Te	Documented In-House Method SM044 (using ICP-MS) conforming to: BS ISO 23380:2022; and ASTM D6357:2021	A
ASH	Trace Elements: As, Be, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Se, Sn, V, Zn	Documented In-House Method SM044 (using ICP-MS) conforming to BS EN ISO 16968:2015	A
SOLID BIOFUELS	Sampling	Documented In-House Method KES/93/Prep-B conforming to: BS EN 18135:2017; BS EN ISO 14780:2017 + A1 2019	A,B, E



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	<u>Chemical and Physical Tests</u> (cont'd)		
SOLID BIOFUELS (cont'd)	Sample Preparation	Documented In-House Method KES/93-Prep-B conforming to: BS EN 18235:2017 BS EN ISO 14780:2017+ A1 2019	B
	Minor Elements: As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, Se, Ti, V, Zn, B, Ti, U, Sn, Te	Documented In-House Method SM044 (using ICP-MS) conforming to: BS EN ISO 16967:2015; and ISO BS EN 16968:2015	A
	Particle Size Distribution	Documented In-House Method SM048 conforming to BS EN ISO 17827:Part 1 :2016	B
SOLID BIOFUELS (including WOOD PELLETS) and ASH	Particle Size Distribution: <3.15mm	Documented In-House Method SM049 conforming to BS EN ISO 17827: Part 2:2016	B
SOLID BIOFUELS	Particle Size Distribution of Disintegrated Pellets	Documented In-House Method SM049 conforming to BS EN ISO 17830:2016	B
WOOD PELLETS	Length Diameter	Documented In-House Method SM048 conforming to BS EN ISO 17829:2015	B
WOOD PELLETS COMPRESSED FUELS	Particle Density	Documented In-House Method SM054, BS EN ISO 18847:2016	A
SOLID BIOFUELS (including WOOD PELLETS), ASH and SOLID RECOVERED FUELS	Bulk Density	Documented In-House Method SM050 conforming to: BS EN ISO 17828:2015 and DD CEN/TS 15401:2010	B



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	<u>Chemical and Physical Tests</u> (cont'd)		
SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE	Sample Preparation	Documented In-House Method KES/93/Prep-S conforming to: BS EN ISO 21646:2022	B
SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE	Minor Elements: As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, Se, Tl, V, Zn, B, Ti, U, Sn, Te	Documented In-House Method SM044 (using ICP-MS) conforming to: BS EN 15410:2011; and BS EN 15411:2011	A
COAL, COKE, SOLID BIOFUELS, PEAT, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE	Chlorine and Fluorine	Documented In-House Method SM045 (using Ion Chromatography) conforming to: BS EN ISO 16994:2016 and BS EN 15408:2011	A
COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE, PEAT, SOILS, COLLIERY SPOIL and HIGH ASH MATERIALS	Total Moisture	Documented In-House Method SM030 (Gravimetric Determination) conforming to: ISO 589:2008 ISO 579:2013 BS EN ISO 18134-2:2017 CEN/TS 15414, Part 2; 2010	A, B
COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE, PEAT, SOILS, COLLIERY SPOIL and HIGH ASH MATERIALS	Analysis Moisture	Documented In-House Method SM031 (Gravimetric Determination) conforming to: ISO 11722:2013 ISO 687:2010 BS EN ISO 18134-3:2023 BS EN ISO 21660-3:2021	A
	Ash	Documented In-House Method SM033 Gravimetric Based on ISO1171:2010, ASTM D3174:2012, BS EN ISO 18122:2022, BS EN ISO 21656:2021	A



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COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE, PEAT, SOILS, COLLIERY SPOIL and HIGH ASH MATERIALS (cont'd)	<u>Chemical & Physical Tests</u>	<u>Documented In House Methods</u>	
	Total Sulphur	Documented In-House Method SM 034 (using combustion Infra-Red Analyser) conforming to: ASTM D4239:2021 and ; ISO 17247:2020; BS EN ISO 16994:2016, and BS EN ISO 21663:2020	A
	Volatile Matter	Documented In-House Method SM032 (Gravimetric Determination) conforming to: BS ISO 562:2010; ASTM D3175:2020; BS EN ISO 18123:2023; BS EN ISO 22167:2021	A
	Carbon Hydrogen Nitrogen	Documented In-House Method SM 035 (based on Instrumental Determination) conforming to: ASTM D5373:2021; ISO BS EN 16948:2015; BS EN ISO 21663:2020; BS ISO 29541:2010	A
	Gross Calorific Value	Documented In-House Method SM 036 (using Bomb Calorimetry) conforming to: BS ISO 1928:2020; BS EN ISO 18125:2017; BS EN ISO 21654:2021; ASTM D5865:2019;	A
COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE	Chloride	Documented In-House Method SM039 (Ion Selective Electrode Testing of aqueous residue from Test SM036) conforming to: BS EN 16994:2016, ASTM D4208:2019 & BS EN 15408:2011	A



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COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE, PEAT, SOILS, COLLIERY SPOIL and HIGH ASH MATERIALS COAL, COKE, SOILS, COLLIERY SPOIL and HIGH ASH MATERIALS BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE and other CARBONACEOUS MATERIALS SOLID BIOFUELS: PELLETS and BRIQUETTES COAL, SOLID BIOFUEL and SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE	<u>Chemical & Physical Tests</u> Calculation of Net Calorific Value	<u>Documented In House Methods</u> Documented In-House Method SM 037 conforming to: BS ISO 1928:2020 BS EN ISO 18125:2017 BS EN ISO 21654:2021 ASTM D5865 :2019	A
	Calculation of Fixed Carbon	Documented In-House Method SM 022 conforming to: BS 1016, Part 100:1994 ASTM D3172:2021	A
	Biomass Content expressed As; Mass, by Energy Content (<u>gross or net calorific value</u>), <u>or Carbon Content</u>	Documented In-House Method SM 042 (using Selective Dissolution Method) conforming to: BS EN ISO 21644:2021 (Annex B)	A
	Biomass and Fossil Energy Content	Documented In-House Method SM 046 based on "Template Methodology for measuring fossil derived contamination within waste wood" Ofgem Guidance Note 9 November 2013.	B
	Mechanical Durability	Documented In-House Method SM 043 (using Pellet Tester) conforming to: ISO BS EN 17831-1:2015	B
	Determination of Fines Content	Documented In-House Method SM 053 (using 3.15mm Sieve) conforming to: BS EN ISO 18846:2016	B
Carbonate Content and Calculation of Organic Carbon Content	Documented In-House Method SM 047 (by Titrimetry) conforming to: BS 1377-3:2018+A1 2021	A	



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COAL, SOLID BIOFUEL and SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE TROMMEL FINES SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, SOLID MUNICIPAL WASTE	<u>Chemical & Physical Tests</u> Ash Fusion Temperature	<u>Documented In House Methods</u> Documented In-House Method SM017 (using Ash Fusion Furnace) conforming to: ISO 540:2008; ASTM D1857:2018; and BS EN ISO 21404:2020CEN/TS 15404:2010	A
	Loss on Ignition at specified temperatures inc 440°C, 550°C, 815°C	Documented In-House Method SM052 based on BS ISO 1171:2010 BS ISO 18122:2022 , BS EN ISO 21656:2021 and BS EN 15935:2021	A
	Loss on Ignition at specified temperatures inc 440°C, 550°C, 815°C	Documented In-House Method SM052 in accordance with HMRC document LFT1:2023	A
	Sampling and Sample Preparation		
	Sampling of Solid Recovered Fuels	Documented in-house procedure QOP06 based on BS EN 21645:2021	D, E
	Sample Preparation of Solid Recovered Fuels (sample division, oven drying, grinding, shredding)	Documented in-house procedure TCM010 based on BS EN ISO 21646:2022	D
	Total Moisture	Documented in house procedure TCM01 based on BS EN 15414-1:2020	D
Calculation of Net Calorific Value	Documented in-house procedure LM20 (calculation) based on BS EN ISO 21654:2021	D	



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SOLID FUELS	<u>Chemical & Physical Tests</u>	<u>Documented In House Methods</u>	
COAL & COKE	Sample Preparation	Documented In-House Method 94.PREP.W005 conforming to: BS ISO 18283:2022	C
COAL & COKE	Hardgrove Grindability Index (HGI)	Documented In-House Method COAL.W008 (using Hardgrove Machine) based on: BS ISO 5074:2015; and ASTM D409:2016	C
COAL	Free Swelling Index (Crucible Swelling Number)	Documented In-house Method COAL.W010 based on BS ISO 501:2012	C
SOLID BIOFUELS	Sample Preparation	Documented In-House Method 94.PREP.W005 conforming to: BS EN 18235:2017 BS EN ISO 14780:2017+ A1 2019	C
COAL, COKE AND SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS, MUNICIPAL SOLID WASTE	Major and Minor Elements	Documented In-House Method XRF.W035 (using X-Ray Fluorescence Spectrometry) conforming to: ISO/CD 13605; PD ISO/TS 16996:2015 and ASTM D4326:2021	C
COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS	Chlorine and Fluorine	Documented In-House Method COAL.W011 (using Ion Chromatography) based on ASTM D4208:2019, and BS EN 15408:2011	C
COAL	Mercury	Documented In-House Method XRF.W002 (using dedicated mercury analyser) based on ASTM D6722:2019	C



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COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS,	<u>Chemical & Physical Tests</u>	<u>Documented In-House Method</u>	
	Total Moisture	Documented In-House Method COAL.W003 (Gravimetric Determination) conforming to: ISO 589:2008 ISO 579:2013 BS EN ISO 18134-2:2017 CEN/TS 15414, Part 2; 2010	C
	Analysis Moisture	Documented In-House Method COAL.W004 (Gravimetric Determination) conforming to: ISO 11722:2013 ISO 687:2010 BS EN ISO 18134-3:2023 BS EN ISO 21660-3:2021	C
	Ash	Documented In-House Method COAL.W005 Gravimetric Based on ISO1171:2010, ASTM D3174:2012, BS EN ISO 18122:2022, BS EN ISO 21656:2021	C
	Volatile Matter	Documented In-House Method COAL.W006 (Gravimetric Determination) conforming to: BS ISO 562:2010 ASTM D3175:2020; BS EN ISO 18123:2023 BS EN ISO 22167:2021	C
COAL	Carbon Hydrogen Sulphur	Documented In-House Method COAL.W001 (based on Instrumental Determination) conforming to: ASTM D5373:2021; ISO BS EN 16948:2015 BS EN ISO 21663:2020; BS ISO 29541:2010 and ASTM D4239:2018	C
	Carbon Nitrogen Sulphur Hydrogen	Docuemnted in house method 94.Coal.W012 by combustion Conforming to ASTM D5273-21 And ASTM D4239-18	



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	<u>Chemical & Physical Tests</u>	<u>Documented In House Method</u>	
COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS	Gross Calorific Value	Documented In-House Method COAL.W002 (using Bomb Calorimetry) conforming to: BS ISO 1928:2020 BS EN ISO 18125:2017 BS EN ISO 21654:2021 ASTM D5865:2019;	C
COAL, COKE, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS	Calculation of Net Calorific Value	Documented In-House Method COAL/W002c conforming to: BS ISO 1928:2020 BS EN ISO 18125:2017 BS EN ISO 21654:2021 ASTM D5865 :2019	C
COAL, COKE	Calculation of Fixed Carbon	Documented In-House Method COAL.W007 conforming to: BS 1016, Part 100:1994 ASTM D3172:2021	C
COAL, SOLID BIOFUELS, SOLID RECOVERED FUELS, REFUSE DERIVED FUELS	Ash Fusion Temperature	Documented In-House Method COAL.W009 (using Ash Fusion Furnace) conforming to: ISO 540:2008; ASTM D1857:2018; and BS EN ISO 21404:2020CEN/TS 15404:2010	C
METALS, ALLOYS AND METAL PRODUCTS			
Ferrotungsten	Tungsten	Documented in-house method XRF.W031 (by fused bead X-Ray Fluorescence Spectrometry)	C
Ferromolybdenum	Molybdenum Silicon Copper Phosphorus	Documented in-house method XRF.W032 (by fused bead X-Ray Fluorescence Spectrometry)	C
Autocatalysts	Platinum Palladium Rhodium	Documented in house method 94.ICP.W010	C



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METALS, ALLOYS AND METAL PRODUCTS	<u>Chemical & Physical Tests</u>	<u>Documented In House Methods</u>	
Ferroalloys	Carbon Sulphur	Documented in-house method XRF.W003 (using combustion-IR analyser)	
	Oxygen Nitrogen	Documented in-house method XRF.W004 (using combustion-IR analyser)	C
Iron Ore	Manganese Iron Silicon Aluminium Phosphorous Titanium Magnesium Calcium	Documented in-house method XRF.W033 (by fused bead X-Ray Fluorescence Spectrometry) based on ISO 12677 and ISO 9516	C
Manganese Ore	Manganese Iron Silicon Aluminium Phosphorus Titanium Magnesium Calcium	Documented In-house method XRF.W034 (by fused bead X-Ray Fluorescence Spectrometry)	C
END			