



CERTIFICATE OF ACCREDITATION

This is to attest that

ALFRED H KNIGHT NORTH AMERICA LTD

3112 RUBY STREET
GONZALES, LOUISIANA 70737, U.S.A.

Testing Laboratory TL-608

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date March 22, 2024



A handwritten signature in black ink, reading "Raj Nathan".

President

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | www.iasonline.org

ALFRED H KNIGHT NORTH AMERICA LTD

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Accredited to ISO/IEC 17025:2017

Effective Date March 22, 2024

Chemical	
AHK/63/SPREP1	Sampling and sample preparation procedures manual based on ISO 18283, ASTM D2013 and ASTM D2234 - hard coal and coke -- manual sampling, ISO 18135:2017 - solid biofuels -- sampling and BS EN ISO 14780:2017 + A1:2019 - solid biofuels -- sample preparation
GSM010	Determination of crucible swelling index of coal based on ISO 501:2012-hard coal-- determination of the crucible swelling number and ASTM D720/D720M: standard test method for free-swelling index of coal
GSM017	Determination of the fusibility of coal, coke and solid biofuel ash based on ISO 540:2008- hard coal and coke-determination of ash fusibility, ASTM D1857/D1857M - standard test method for fusibility of coal and coke ash, and ISO 21404:2020 - solid biofuels- method for the determination of ash melting behavior- characteristic temperatures method
GSM025	Determination of fixed carbon in coal (calculations) based on ISO 17246:2010 - coal -- proximate analysis and ASTM D3172 - standard practice for proximate analysis of coal and coke
GSM030	Determination of the total moisture content in coal and solid biofuels based on ISO 589- hard coal -- determination of total moisture, ASTM D3302/3302M - standard test method for total moisture in coal, and ISO 18134-2:2015 - solid biofuels -- determination of moisture content -- oven dry method -- part 2: total moisture -- simplified method
GSM031	Determination of moisture content of analysis sample of coal and solid biofuels based on ISO 11722 -- solid mineral fuels -- hard coal -- determination of moisture in the general analysis test sample by drying in nitrogen, ASTM D3173 - standard test method for moisture in the analysis sample of coal and coke, and ISO 18134-3:2015 - solid biofuels -- determination of moisture content -- oven dry method -- part 3: moisture in general analysis sample
GSM032	Determination of volatile matter content of coal and solid biofuels based on ISO 562:2010 - hard coal and coke -determination of volatile matter, ASTM D3175 - standard test method for volatile matter in the analysis sample of coal and coke, and ISO 18123:2015 - solid biofuels -- determination of the content of volatile matter
GSM033	Determination of ash content of coal and solid biofuels based on ISO 1171:2010 - solid mineral fuels -determination of ash, ASTM D3174 - standard test method for ash in the analysis sample of coal and coke from coal, and ISO 18122:2015 - solid biofuels -determination of ash content

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GSM034	Determination of total Sulphur, carbon and hydrogen contents of coal and solid biofuels based on ISO 29541:2010 - solid mineral fuels -- determination of total carbon, hydrogen and nitrogen content -- instrumental, ISO 19579:2006 - solid mineral fuels -- determination of sulfur by IR spectrometry, ASTM D4239 - standard test method for sulfur in the analysis sample of coal and coke using high-temperature tube furnace combustion, ASTM D5373 - standard test methods for determination of carbon, hydrogen and nitrogen in analysis samples of coal and carbon in analysis samples of coal and coke, ISO 16948:2015 - solid biofuels -- determination of total content of carbon, hydrogen and nitrogen, and ISO 16994:2016 - solid biofuels -- determination of total content of sulfur and chlorine
GSM035	Determination of carbon, hydrogen and nitrogen contents of coal and solid biofuels using a dedicated analyser based on ISO 29541:2010 - solid mineral fuels -determination of total carbon, hydrogen and nitrogen content -- instrumental method, ASTM D5373 - standard test methods for determination of carbon, hydrogen and nitrogen in analysis samples of coal and carbon in analysis samples of coal and coke, and ISO 16948:2015 - solid biofuels -- determination of total content of carbon, hydrogen and nitrogen
GSM036	Determination of the gross calorific value of coal and solid biofuels by bomb calorimetry based on ISO 1928:2020 - solid mineral fuels -- determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value, ASTM D5865 - standard test method for gross calorific value of coal and coke, and ISO 18125:2017 - solid biofuels -- determination of calorific value
GSM037	Calculation of the net calorific value of fuels based on ISO 1928:2020 - solid mineral fuels -- determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value, ASTM D5865 - standard test method for gross calorific value of coal and coke, and ISO 18125:2017 - solid biofuels -- determination of calorific value
GSM038	Method for the determination of total fluorine in samples of coal and solid biofuels by oxygen bomb combustion, with measurement by ion selective electrode based on ASTM D3761 - standard test method for total fluorine in coal by the oxygen bomb combustion/ion selective electrode method and BS EN 15408:2011 - solid recovered fuels -- methods for the determination of Sulphur (S), chlorine (Cl), fluorine (F) and bromine (Br) content
GSM039	Method for the determination of total chlorine in samples of coal and solid biofuels by oxygen bomb combustion, with measurement by ion selective electrode based on ASTM D4208 - standard test method for total chlorine in coal by the oxygen bomb combustion/ion selective electrode method and ISO 16994:2016 - solid biofuels -- determination of total content of sulfur and chlorine
GSM040	Method for the determination of major and minor elements in samples of ash, coal, coke and solid biofuel by x-ray fluorescence based on ISO 13605:2018 - solid mineral fuels -- major and minor elements in hard coal ash and coke ash -- wavelength dispersive x-ray fluorescence spectrometric method; ASTM D4326 - standard test method for major and minor elements in coal and coke ash by x-ray fluorescence and ISO 16996:2015 – solid biofuels – determination of the elemental composition by X-Ray Fluorescence

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GSM041	Determination of the hardgrove grindability index of coal based on ISO 5074:1994 - hard coal -- determination of hardgrove grindability index and ASTM D409/D409M - standard test method for grindability of coal by the hardgrove-machine method
GSM043	Method for the determination of biomass pellet mechanical durability based on ISO 17831-1:2015 - solid biofuels -- determination of mechanical durability of pellets and briquettes -- part 1: pellets
GSM044	Method for the determination of metals in samples of ash, coal and solid biofuel by microwave digestion, with measurement by ICP-MS based on ISO 23380:2013 - selection of methods for the determination of trace elements in coal, ASTM D6357 - test methods for determination of trace elements in coal, coke, & combustion residues from coal utilization processes by inductively coupled plasma atomic emission, inductively coupled plasma mass, & graphite furnace atomic absorption spectrometry, BS EN ISO 16967:2015 - solid biofuels -- determination of major elements -- Al, Ca, Fe, Mg, P, K, Si, Na and Ti, and BS EN ISO 16968:2015 - solid biofuels -- determination of minor elements
GSM048	Determination of particle size: length and diameter of wood pellets based on ISO 17829:2015 - solid determination of length and diameter of pellets
GSM049	Determination of particle size distribution of pellets and disintegrated pellets based on ISO 17830:2016 - solid biofuels -- determination of particle size distribution of disintegrated pellets
GSM050	Solid Biofuels - Determination of bulk density based on ISO 17828
GSM053	Solid Biofuels – Method for determination of fines (< 3.15 mm) and coarse fines (< 5.6 mm) content in quantities of pellets based on BS EN ISO 18846
GSM054	Solid Biofuels – Method for Determination of Particle Density of Pellets based on BS EN ISO 18847