

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>0131</p> <p>Accredited to ISO/IEC 17025:2017</p>	<p>SGS United Kingdom Limited</p> <p>Issue No: 042 Issue date: 01 April 2021</p>	
	<p>Rossmore Business Park Ellesmere Port South Wirral Cheshire CH65 3EN</p>	<p>Contact: Mr Paul Dunkerton Tel: +44 (0)151 350 6672 Fax: +44 (0)151 350 6620 E-Mail: paul.dunkerton@sgs.com Website: www.uk.sgs.com</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	
CHEMICALS, ORGANIC	<u>Chemical and Physical Tests</u>	Flexible scope enabling new versions of existing accredited standard test methods to be introduced in accordance with documented in house procedure OGC-GEN-1QP-018	
	<u>Chemical and Physical Tests</u>	Joint IP/ASTM methods marked with an asterisk (*) Equivalent ISO/IP methods marked with a hash (#)	
	Distillation of volatile organic liquids	IP 195*ASTM D1078	
	ORGANIC SOLVENTS	<u>Chemical and Physical Tests</u>	
		Acidity	ASTM D847 by titration
Acid Wash Colour		ASTM D848	
	Non-volatile Matter	ASTM D1353	
	Water Content	ASTM E1064 by Coulometric Karl Fisher	



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
PETROLEUM and PETROLEUM PRODUCTS	<u>Chemical and Physical Tests</u>	Flexible scope enabling new versions of existing accredited standard test methods to be introduced in accordance with documented in house procedure OGC-GEN-1QP-018 Joint IP/ASTM methods marked with an asterisk (*) Equivalent ISO/IP methods marked with a hash (#)
	Acid or base number	IP 139*ASTM D974 by Colorimetric Titration #ISO 6618
	- acid number	IP 177*ASTM D664 by potentiometric titration
	Additive elements in lubricating oil - Ca, Mg, P, S, Zn	ASTM D4951 by ICP-AES
	Aniline and mixed point	IP 2*ASTM D611 #ISO 2977
	Ash	IP 4*ASTM D482 #ISO 6245
	Ash sulphated	IP 163*ASTM D874 #ISO 3987
	Asphaltenes (heptane insolubles)	IP 143*ASTM D6560
	Bromine number	IP 130*ASTM D1159 #ISO 3839
	Base number	IP 276*ASTM D2896 #ISO 3771
	Burning characteristics of kerosene - char value	IP 10 24 hour method
	Carbon, Hydrogen and Nitrogen	ASTM D5291
	Carbon residue	IP 398 #ISO 10370



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Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
PETROLEUM and PETROLEUM PRODUCTS (cont'd)	<u>Chemical and Physical Tests (cont'd)</u> Cetane number of diesel Cetane Index: - calculated Cloud point Cold filter plugging point of distillate fuels Colour: - ASTM Corrosiveness to copper Density Distillation range of crude petroleum	Flexible scope enabling new versions of existing accredited standard test methods to be introduced in accordance with documented in house procedure OGC-GEN-1QP-018 Joint IP/ASTM methods marked with an asterisk (*) Equivalent ISO/IP methods marked with a hash (#) (cont'd) IP 41 # BS EN ISO 5165 ASTM D613 IP 41/99(17)*ASTM D613-01# BS 2000-41:98 / ISO 5165:1998 ASTM D976 IP 380*ASTM D4737 #ISO 4264 IP 219 #ISO 3015 ASTM D2500 IP 309/99 # EN 116-97 IP 196*ASTM D1500 #ISO 2049 IP 154*ASTM D130 #ISO 2160 IP 365 #ISO 12185 ASTM D4052 by digital density meter ASTM D2892 15-theoretical plate column



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PETROLEUM and PETROLEUM PRODUCTS (cont'd)	<u>Chemical and Physical Tests (cont'd)</u> Distillation characteristics at atmospheric pressure Doctor test Electrical conductivity of aviation and distillate fuels Flash point Flash and Fire point Foaming characteristics of lubricating oil Freezing point of aviation fuels Gum existent in fuels Hydrocarbon types: aromatic in diesel fuel and distillates Paraffin, naphthene and aromatic hydrocarbon Mercaptan sulphur content	Flexible scope enabling new versions of existing accredited standard test methods to be introduced in accordance with documented in house procedure OGC-GEN-1QP-018 Joint IP/ASTM methods marked with an asterisk (*) Equivalent ISO/IP methods marked with a hash (#) (cont'd) IP 123 #ISO 3405 ASTM D86 ASTM D1160 by reduced pressure IP 30 IP 274*ASTM D2624 #ISO 6297 IP 170 / ISO 13736 (Abel) IP 34 / ASTM D93 / ISO 2719 (PMCC) IP 36 / ASTM D92 / ISO 2592 (COC) IP 146*ASTM D892 IP 16 ASTM D2386 IP 131*ASTM D381 #ISO 6246 IP 391 # EN ISO 12916 ASTM D5443 IP 342*ASTM D3227 #ISO 3012



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PETROLEUM and PETROLEUM PRODUCTS (cont'd)	<p><u>Chemical and Physical Tests</u> (cont'd)</p> <p>Metals in lubricating oils:</p> <ul style="list-style-type: none"> - Al, Ag, B, Ba, Ca, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, S, Si, Sn, Ti, V, Zn <p>Metals in fuel oils:</p> <ul style="list-style-type: none"> - Al, Ca, Fe, Na, Ni, P, Si, V, Zn <p>Naphthalenes in aviation turbine fuels</p> <p>Nitrogen, trace</p> <p>Octane number:</p> <ul style="list-style-type: none"> - Motor - Research <p>Organic halogens</p>	<p>Flexible scope enabling new versions of existing accredited standard test methods to be introduced in accordance with documented in house procedure OGC-GEN-1QP-018</p> <p>Joint IP/ASTM methods marked with an asterisk (*) Equivalent ISO/IP methods marked with a hash (#) (cont'd)</p> <p>ASTM D5185 using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)</p> <p>IP 501 by ICP Spectroscopy</p> <p>ASTM D1840</p> <p>IP 379*ASTM D4629</p> <p>IP 236 #ISO 5163 ASTM D2700 IP 236/17*ASTM D2700-17 #EN ISO 5163:14</p> <p>IP 237 #ISO 5164, BS 2000: 237 ASTM D2699 IP 237/14*ASTM D2699-012 #EN ISO 5164:14</p> <p>IP 510</p>



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PETROLEUM and PETROLEUM PRODUCTS (cont'd)	<u>Chemical and Physical Tests (cont'd)</u> Oxidation stability: - Gasoline - JFTOT Particulate contamination: - Distillate fuels Pour point Quinizarin Rust preventative characteristics Sediment Part 1: Total sediment in residual fuel oils Part 2: Ageing of Residue Fuel Oils Smoke point Specific energy Sulphur	Flexible scope enabling new versions of existing accredited standard test methods to be introduced in accordance with documented in house procedure OGC-GEN-1QP-018 Joint IP/ASTM methods marked with an asterisk (*) Equivalent ISO/IP methods marked with a hash (#) (cont'd) IP 40*ASTM D525 #ISO 7536 IP 323*ASTM D3241 ASTM D4176 IP 15*ASTM D97 #ISO 3016 IP 298 IP 135*ASTM D665 IP 53*ASTM D473 ASTM D4870 by hot filtration IP 375*ASTM D4870 #ISO 10307-1 IP 390 #ISO 10307-2 IP 598 (manual only)* ASTM D1322 #ISO 3014 IP 12 ASTM D240 IP 336 #ISO 8754 ASTM D4294 by XRF ASTM D2622 by WD-XRF



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PETROLEUM and PETROLEUM PRODUCTS (cont'd)	<u>Chemical and Physical Tests (cont'd)</u> Total acidity of aviation turbine fuel Total salts content of crude oil Total sulfur Vapour pressure (DVPE) Viscosity - calculation of viscosity index from kinematic viscosity - Ravenfield - Apparent viscosity at -25, -30 and -35C Water content Water separation	Flexible scope enabling new versions of existing accredited standard test methods to be introduced in accordance with documented in house procedure OGC-GEN-1QP-018 Joint IP/ASTM methods marked with an asterisk (*) Equivalent ISO/IP methods marked with a hash (#) (cont'd) IP 354*ASTM D3242 IP 265 by conductimetric method ASTM D5453 ASTM D 5191 IP 394 IP 71, Section 1* ASTM D445 #ISO 3104 IP 226*ASTM D2270 #ISO 2909 CEC-L-36-A-90 ASTM D4741 Ravenfield HTHS Viscometer ASTM D5293 Cold Crank Simulator IP 74*ASTM D95 #ISO 3733 ASTM D3948



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<p>INORGANIC AND ORGANIC MATRICES</p> <p>Oils Greases Lubricants Detergents Surfactants Additives</p> <p>Polymer composites</p> <p>Pharmaceuticals</p>	<p><u>Chemical Tests</u></p> <p>Oxidative induction time Onset/degradation temperatures Enthalpy Specific heat capacity</p> <p>Glass transition temperature Crystallinity Melt temperature Enthalpy Specific heat capacity Thermal stability</p> <p>Polymorphism Melt temperature Thermal stability</p>	<p>Analysis through the appropriate application of documented in-house methods using the flexible scope documents OGC-GEN-1QP-018</p> <p>CEC-L-85-99 Pressure DSC OGC-EP-PRO-LAB-NR-006 DSC</p> <p>OGC-EP-PRO-LAB-NR-006 DSC</p> <p>OGC-EP-PRO-LAB-NR-006 DSC</p>
<p>TRANSFORMER OIL</p> <p>PETROLEUM and PETROLEUM PRODUCTS – Used Oil</p>	<p><u>Chemical Tests</u></p> <p>Parts per million (ppm) of gas in oil by headspace gas analysis</p> <p><u>Oil Condition Monitoring Tests</u></p> <p>Pensky Marten flash point</p> <p>Total acid number</p> <p>Total base number</p>	<p>IEC 60567 (modified)</p> <p>ASTM D93 (modified) using in-house procedure OGC-OCM-PRO-LAB-008</p> <p>ASTM D664 (modified) using in-house procedure OGC-OCM-PRO-LAB-006</p> <p>ASTM D2896 (modified) using in-house procedure OGC-OCM-PRO-LAB-003</p>

END