Laboratory	**Hindalco Industries Limited, HIC Semi Fab, Plot No. 2, MIDC Taloja AV, Navi Mumbai, Raigad District, Maharashtra**
Accreditation Standard	**ISO/IEC 17025: 2017**
Certificate Number	**TC-6961** **Page 1 of 5**
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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		CHEMICAL TESTING		
I.	**LUBRICANTS**			
1.	**Gear Oil, Hydraulic Oil, Bearing Oil, Thermic Fluid, Emulsion, Rolling Oil, Turbine Oil**	Appearance	HIC/NABL/LC/L3/002 Issue No. 01 Rev. No. 00 Effective Date 12/12/2013	Qualitative
		Flash Point (COC)	IS 1448 [P 69]	70 °C to 400 °C
		Flash Point (PMCC)	IS 1448 [P 21]	40 °C to 370 °C
		Neutralization Number,	ASTM D 974	0.001 mgKOH/g to 2.0 mgKOH/g
		Water by distillation	IS 1448 [P 40]	0.02 % by mass to 2.0 % by mass
		Moisture Content	IS 13567	0 to 500mg/kg
		Kinematic Viscosity at 40 deg. C, mm2/s and cSt	IS 1448 [P 25]	2 mm^2/s to 1000 mm^2/s
		Kinematic Viscosity at 100 deg. C, mm2/s mm2/s and cSt	IS 1448 [P 25]	2 mm^2/s to 100 mm^2/s
		Viscosity Index	IS 1448 [P 56]	Upto 190
		Total Ash Content	IS 1448 [P 4]	0.001% by mass to 0.180 % by mass
		Fatty Alcohol Concentration	HIC/NABL/LC/L3/022 Issue No. 01 Rev. No. 00 Effective Date 12/12/2013	03% to 08% by mass
		Particulate Ash	HIC/NABL/LC/L3/015 + IS 1448 [P 4] : 1984 combination Issue No. 01 Rev. No. 00 Effective Date 12/12/2013	0.0001 % by mass to 0.01 % by mass

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Contamination Level (Heavy Ends)	HIC/NABL/LC/L3/012 Issue No. 01 Rev. No. 00 Effective Date 12/12/2013	Upto 4 % by mass
		Distillation Range	IS 1448 [P 18]	IBP: 100 °C to 240 °C FBP: 250 °C to 300 °C
		Colour	ASTM D 1500	Upto 8
		Pour Point,	IS 1448 [P 10 /Sec 2]	(-)69 °C to +20 °C
		Sediments	IS 1448 [P 41]	Upto 3 % by volume
		Ferrography	HIC/NABL/LC/L3/025 Issue No. 01 Rev. No. 00 Effective Date 12/12/2013	Digital Viscosity 20 DV to 680 DV
		Ferrography	HIC/NABL/LC/L3/025 Issue No. 01 Rev. No. 00 Effective Date 12/12/2013	NAS Value 5 to 15
		Density by Hydrometer	IS 1448 [P 16] ASTM D 1298	0.7000 gm/cc to 0.9500 gm/cc
		Density by Digital Density meter	ASTM D 4052	0.5000 gm/cc to 1.000 gm/cc
		Sulphated Ash	IS 1448 [P 4] - Method A	0.001% by mass to 0.180 % by mass
		Copper Corrosion	IS 1448 [P 15]	1 a to 4 b
		Drop Point	IS 1448 [P 52]	90 °C to 300 °C
		Consistency of Grease	IS 1448 [P 60]	Upto 475
		Oil Concentration by Acid-split method	HIC/NABL/LC/L3/007 Issue No. 01 Rev. No. 00 Effective Date 12/12/2013	1.0% to 3.0 % by volume
		Kinematic Viscosity at 40 C after separation of oil by vacuum evaporator, mm2/s & cSt	HIC/NABL/LC/L3/032 Issue No. 01 Rev. No. 00 Effective Date 13/12/2013	38 mm^2/s to 70 mm^2/s

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		Particle Size Analysis	HIC/NABL/LC/L3/037 Issue No. 01 Rev. No. 00 Effective Date 2/2/2016	0.02 µm to 200 µm
		pH	IS 3025 [P-11]	1 to 14
		Conductivity	IS 3025 [P-14]	Upto 1000 µS
		Carbon Chain Distribution of HNP by GC Method, % volume	HIC/NABL/LC/L3/038 Issue No. 01 Rev. No. 00 Effective Date 2/2/2016	C13 <10 C14 > 60 C15 10-30 C16 <10 (% by volume)
		Auto Distillation Distillation Range	ASTM D 86	IBP: 100 °C to 240 °C FBP: 250 °C to 300 °C
		Auto Flash Point (PMCC)	IS 1448 [P 21]	Ambient to 370 °C
		Auto Kinematic Viscosity at 40 deg. C, mm2/s & cSt	IS 1448 [P 25] ASTM D445	2 mm^2/s to 1000 mm^2/s
		Auto Kinematic Viscosity at 100 ^{0}C, mm2/s & cSt	IS 1448 [P 25] ASTM D445	2 mm^2/s to 100 mm^2/s
		Contamination by Gum Tester	HIC/NABL/LC/L3/039 Issue No. 01/Rev. No. 00 Effective Date 16/2/2016	Upto 4 % by mass
		Multi element Determination of Used and Unused Lubricating Oils and Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES). (Fe, Pb, Cu, Cr, Al, Ni, Ag, Sn, Si, Bo, Na, P, Zn, Ca, Ba, Mg, V, Cd, Mn, Mo, Ti)	ASTM D5185	0.1 mg/L to 500 mg/L

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II.	**SOLID FUELS**			
1.	**Fuel Oil Coal & Coke**	Moisture in Coal & Coke by TGA	ASTM D7582	1% to 25 % by mass
		Ash in Coal & Coke by TGA	ASTM D7582	0.5 % to 60 % by mass
		Volatile matter in Coal & Coke by TGA	ASTM D7582	0.4 % to 60 % by mass
		Fixed Carbon in Coal & Coke by TGA	ASTM D7582	1% to 95 % by mass
		Sulfur in Coal and Coke by CS Analyzer	ASTM D 4239	0.0500% to 10.00 % by mass
		Gross Calorific value of Coal & Coke by Calorimeter	ASTM D 5865	1500 cal/g to 8000 cal/g
		Sulphur in Furnace oil	ASTM D1552	0.06 % to 5.0 % by mass
		Kinematic Viscosity @ 50 ºC, cSt	IS 1448 [P 25] ASTM D 445	100 mm^2/s to 300 mm^2/s
		Gross Calorific value of Liquid Hydrocarbon Fuels by Calorimeter, cal/gram	ASTM D240	1500 cal/g to 11000 cal/g

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ELECTRICAL TESTING

I.	**INSULATING MATERIALS & INSULATORS**			
1.	**Transformer Oil**	Interfacial Tension	IS 6104	Upto 0.09 N/m
		Electric Strength	IS 6792	Upto 100 kV rms
		Dielectric Constant	IS 6262	1 to 5
		Dielectric Dissipation Factor (Tan Delta)	IS 6262	Upto 1.0
		Specific Resistivity	IS 6103	10^6 ohm-cm to 10^{15} ohm-cm
		Density at 27 °C	IS 335	0.7000 gm/cm^3 to 1.0000 gm/cm^3
		Dissolved Gas Analysis	IS 9434 ASTM D 3612-02 Method C	Hydrogen : 1 uL/L and above Hydrocarbons : 1 uL/L and above Carbon Oxides : 25 uL/L and above Atmospheric Gases : 50 uL/L and above
		Sediment &/ or Precipitable Sludge	IS 1866	Upto 10 %
		Furanic Compound by HPLC	IEC 61198	Upto 30 mg/kg
		Carbon Type Analysis (PNA) by FTIR	IS 13155	Aromatic (C_A)=0 to 20 % Paraffin (C_P) = 30 % to 80 % Naphthenic (C_N) = 20 % to 60 %
		Concentration (DBPC) in Oil	IS 13631	0.02 % to 0.9 %
		Moisture Content	IS 13567	Upto 500 mg/kg
		Neutralization Number	ASTM D 974	0.001 to 2.0 mg KOH/g
		Flash Point (PMCC)	IS 1448 [P 21]	Ambient to 370 °C

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