

Laboratory Intertek India Private Limited, Division: Analytical Assesment,
201-204, 2nd Floor, Plot No. 4056, GIDC Phase-III, Dared, Jamnagar,
Gujarat

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-6349

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Validity 29.09.2018 to 28.09.2020

Last Amended on --

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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CHEMICAL TESTING

I.	PETEROLEUM AND PRODUCTS			
1.	Crude Oil	Density at 15°C	ASTM D 1298-12b, ISO:3675-1998	(0.8000 to 0.9900) gm/ml
		Water Content	ASTM D 4006-16	0.025 % to 5.0 % vol
		Sediment By Extractions	ASTM D 473-17	0.00 % to 0.20 %mass
		Water & Sediments	ASTM D 4007-16	0.0 % to 5.0 %v/v
		Pour Point	ASTM D 97-17b	(+30 °C to (-)63 °C,
		Kinematic Viscosity at 40°C	ASTM D 445-17a	(1.0 to 40.00) mm ² /s (cSt)
		Nitrogen Content	ASTM D 4629-17	1 mg/kg to 3000 mg/kg
		Sulphur Content	ASTM D 4294-16	0.10 % to 4.6 %mass
		Ashphaltene	IP 143-2004	0.10 % to 6.0 %m/m
		Total Acid Number	ASTM D 664-17a	(0.01 to 3.0) mgKOH/g
		2.	Diesel/Gas Oil	Kin. Viscosity @ 40°C
Density @ 15°C	ASTM D 4052-18, ISO:12186-1996			(0.8000 to 0.9000) gm/ml
Distillation Range	ASTM D 86-17			110°C to 380°C
Cetane Index	ASTM D 4737-16, ISO:4264-2013			40 to 65 (Calculated)
Sulphur Content	ASTM D 4294-16, ISO:8754-2003			(20 to 1000) mg/kg
Flash Point (PMCC)	ASTM D 93-16a, ISO:2719-2016			40°C to 90°C
Carbon Residue:Micro Method on 10% Volume distillation Residue	ASTM D 4530-15, ISO:10370-2014			0.01 % to 0.30 %m/m
Cloud Point	ASTM D 2500-17a, ISO:3015-1992			(+)49°C to (-)30°C
Pour Point	ASTM D 97-17b,			(+)15 to (-)30°C

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			ISO:3016-1994	
		Ash Content	ASTM D 482-13, ISO:6245:2001	(0.01 to 0.18) %mass
		Sulphur Content	ASTM D 5453-16	0.1 mg/kg to 100 mg/kg
		Cold Filter Plugging Point	ASTM D 6371-17a	(+)15°C to (-)30°C
		Total Acid Number	ASTM D 664-17a	0.01 (to 1.0) mg KOH/g
		Color ASTM	ASTM D 1500-17	(0 + to 5.0) Rating
		Lubricity, Corrected wear Scar avg. microns @ 60°C	ASTM D 6079-16, ISO:12156-2016	100 µm to 800 µm
3.	Residual Fuel Oil/ Furnace Oil	Kin. Viscosity @ 50°C	ASTM D 445-17a, ISO:3104-1994	(80 to 400) mm ² /s (cSt)
		Density @ 15°C	ASTM D 1298-12b, ISO:3675-1998	0.9000 g/ml to 0.9999 g/ml
		Sulphur Content	ASTM D 4294-16, ISO:8754-2003	(0.1 to 5.0) %mass
		Flash Point (PMCC)	ASTM D 93-16a, ISO:2719-2016	45°C to 140°C
		Total Sediment aged	ASTM D 4870-18, ISO:10307-2-2009	(0.005 to 0.20) % mass
		Carbon Residue:Micro Method	ASTM D 4530-15, ISO:10370-2014	(1.0 to 18.00) %m/m
		Pour Point	ASTM D 97-17b, ISO:3016-1994	(+)30°C to (-)18°C
		Water Content	ASTM D 95-13, ISO:3733-1999,	(0.05 to 5.0) % Vol.
		Ash Content	ASTM D 482-13, ISO:6245:2001	(0.01 to 0.18) %mass
		Total Acid Number	ASTM D 664-17a	(0.01 to 3) mg KOH/g
		Metals	IP 501-2005	
		Al		0 mg/kg to 500 mg/kg
		Si		0 mg/kg to 500 mg/kg
		Zn		0 mg/kg to 500 mg/kg

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		V		0 mg/kg to 500 mg/kg
		Ca		0 mg/kg to 500 mg/kg
		Na		0 mg/kg to 500 mg/kg
		P		0 mg/kg to 500 mg/kg
4.	Gasoline	Density @ 15°C	IP 16, ASTM D 4052-18	(0.7000 to 0.8000) gm/ml
		Distillation Range	IP 18, ASTM D 86-17	(35 to 220) °C
		Existent Gum	ASTM D 381-17, IP 540	(2.0 to 80) mg/100ml
		Sulphur Content	ASTM D 5453-16	(0.1 to 100) mg/kg
		Sulphur Content	ASTM D 4294-16	(17 to 1000) mg/kg
		Benzene	ASTM D 3606-17	(0.05 to 10.0) % Vol.
		Oxygenates (Ethanol)	ASTM D 4815-15b	(0.20 to 15.0) % Vol.

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ELECTRICAL TESTING

I.	INSULATING MATERIAL S & INSULATORS			
1.	(Electrical material) Liquid Dielectric material Mineral insulating oil (Transformer oil)	Appearance	IS 335-1993 (RA 2005) IS 1866:00 (RA 2016)	Qualitative
		Density at 29.5 °C	ASTM D1298-12b, IS 1866:00 (RA 2016) (IS 1448) (Part 16:2014)	0.8000 gm/ml to 0.9000 gm/ml
		Density at 15 °C	ASTM D4052-18	0.8000 gm/ml to 0.9000 gm/ml
		Pour Point	ASTM D-97-17b, IS 1866:00(RA 2016) (IS 1448) (Part 10:2013)	(+)15°C to (-)72 °C
		Kinematic Viscosity/Viscosity at 40°C	ASTM D445-17a, IS 1866:00 (RA 2016) IS 1448 (Part 25:76) (RA 2013)	(2.000 to 15.000) mm ² /s, (cSt)
		Flash Point (Close Cup)	ASTM D-93-16a, IS 1866:00 (RA 2016) IS 1448 (Part 21:2012)	100°C to 350°C
		Acid Number/Neutralization Value	ASTM D-664-17a, IS 1866:00(RA 2016) IS 1448 (Part 2:2007)	(0.01 to 1.0) mg KOH/gm
		Aniline Point	ASTM D-611 (B)-16	15°C to 100°C
		Dielectric Breakdown/Electric Strength	ASTM D-877-13, IS 1866:00 (RA 2016) (IS 6792:92) (RA 2013)	(10.0 to 90.0) kV

Rozina
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		Furanic compound a.5-hydroxymethyl 2-furaldehyde, b.2-Furaldehyde, c.2-Acetyl Furan, d.5-Methyl, 2-Furaldehyde	ASTM D5837-15	a.(1 to 1500) µg/l, b.(1 to 1500) µg/l, c.(1 to 1500) µg/l, d.(1 to 1500) µg/l
2.	Electrical material sub group- Liquid Dielectric material Mineral insulating oil (Transformer oil)	Di-electric Dissipation Factor/Power Factor at 25°C, Di-electric Dissipation Factor/Power Factor at 90 °C and 100°C	ASTM D924-15, IS 1866:00 (RA 2016) (IS 6262:71) (RA 2016) ASTM D924-15, IS 1866:00 (RA 2016) (IS 6262:71) (RA 2016)	0.001% to 1.300 % 0.01 %to 1.300 %
		Specific Resistance/Resistivity, Ω-cm	ASTM D-1169-11 IS 1866:00 (RA 2016) (IS 6103:71) (RA 2016)	10 to 2000, 10 ¹² Ω-cm
		Interfacial Tension, mN/m	ASTM D 971-12/ IS 1866:00 (RA 2016) (IS 6104:71) (RA 2011)	(10.0 to73.0) mN/m
		Dissolved Gas Analysis/Total Gas Content		
		CO	ASTM D 3612-17,	1 µl/l to 2000 µl/l
		C ₂ H ₄	IS 1866:2000,	1 µl/l to 2000 µl/l
		C ₂ H ₂	(RA 2016)	1 µl/l to 2000 µl/l
		C ₂ H ₆	(IS 9434:92) (RA 2003)	1 µl/l to 2000 µl/l
		H ₂		1 µl/l to 2000 µl/l
		O ₂		20 µl/l to 100000 µl/l
		N ₂		20 µl/l to 5000000 µl/l
		CH ₄		1 µl/l to 2000 µl/l
		CO		1 µl/l to 2000 µl/l
		C ₃ H ₆		1 µl/l to 2000 µl/l
		C ₃ H ₈		1 µl/l to 2000 µl/l