

Laboratory	Chem-Tech Laboratories Private Limited, Plot No. 22, Parvati Industrial Estate, Pune-Satara Road, Pune, Maharashtra		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	22.08.2016
Certificate Number	T-1143	Valid Until	21.08.2018
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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I.	LUBRICANTS			
1.	Lubricating Oils, Transformer Oils, Metalworking Oils & Fluids, Thermic Fluids, Heat Treatment Oils	Colour	ASTM D 1500: 2012 IP 196/97: 2004	0 to 8
2.	Lubricating Oils, Transformer Oils, Metal Working Oils & Fluids, Heat Treatment Oils, Thermic Fluids	Kinematic Viscosity @ 40 °C	ASTM D 445: 2015a IS 1448 (Part 25): 1976 (RA 2013) IP 71 Sec. 1/97	1 cSt to 460 cSt
		pH	ASTM D 7946-2010, CTP-043, Issue No.01, Dt. 1.6.2016	1 to 14
		Total Acid Number	ASTM D 664: 2011a ASTM D 974: 2014e1 IS 1448 (Part 1/Sec I): 2002 (RA 2007), IP 177, IP139/98: 2004 IP177/96: 2008	(0.001 to 50) mg KOH/g
3.	Lubricating Oils, Metalworking Oils & Fluids, Heat Treatment Oils, Thermic Fluids	Kinematic Viscosity @ 100 °C	ASTM D 445: 2015a IS 1448 (Part 25): 1976 (RA 2013) IP 71 Sec. 1/97	2 cSt to 100 cSt

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4.	Lubricating Oils, Metalworking Oils, Thermic Fluids, Heat Treatment Oils & Fluids	Viscosity Index	ASTM D 2270: 2016 IS 1448 (Part 56): 2013 ISO 2909: 2002, IP226/04	40 to 250
5.	Lubricating Oils	Total Base Number	ASTM D 4739: 2011 ASTM D 2896: 2011 IS 1448 (Part 1/Sec II): 2002 (RA 2013) IS 1448 (Part 86): 77 (RA 2016) IP 276/95: 2004, IP 139/98: 2004	(0.001 to 60) mg KOH/g
		FTIR - Oxidation/Nitration/Sulphation	ASTM E 2412: 2010 ASTM D 7414: 2009 ASTM D 7415: 2009 ASTM D 7418: 2012	0.00 to 1.00 abs/mm

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6.	Lubricating Oils, Additives, Transformer Oils, Metalworking Oils & Fluids	Elemental Analysis – Additive, Contaminant & Wear Metals Ag Al Ba B Ca Cr Cd Cu Fe Pb Mg Mn Li Mo Ni P K Si Sb Na Sn Ti V Zn	ASTM D 6595-2011 CTP-090, Issue No.01, Dt. 1.6.2016	0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 5000 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 1500 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 1500 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 100 mg/kg 0 to 1500 mg/kg
7.	Lubricating Oils & Fluids, Metal Working Oils & Fluids, Heat Treatment Oils, Thermic Fluids	Copper Strip Corrosion rating	ASTM D 130: 2012 IS 1448 (Part 15): 2004 (RA 2016) ISO 2160: 1998 IP 154: 2000	1 a to 4 c

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8.	Lubricating Oils, Transformer Oils, Metal Working Oils & Fluids, Heat Treatment Oils, Thermic Fluids	Water Content – Coulometric	ASTM D 6304: 2007 ISO 12937: 2000 IP 539: 06	10 mg/mg to 25000 mg/kg
		Water Content – Potentiometric	ASTM D 1744: 2013 ASTM E 203: 2008 IP 439/01	200 mg/kg to 1000 mg/kg
9.	Lubricating Oils, Heat Treatment Oils, Thermic Fluids	Crackle Test	CTP-089, Issue No.01, Dt. 1.6.2016	Qualitative (Positive / Negative)
10.	Lubricating Oils, Hydraulic Oils, Turbine Oils	Particle Count and Distribution	ISO 4406, SAE 4059, ASTM D 6786: 2008 ASTM D 7619: 2012b NAS 1638 ASTM D 7647: 2010	Particles $\geq 4 \mu$ - 0 to 28 ISO Code Particles $\geq 6 \mu$ - 0 to 28 ISO Code Particles $\geq 14 \mu$ - 0 to 28 ISO NAS 1 to NAS > 12
11.	Engine Oils	Soot Content	ASTM D 7686: 2011	0 to 12 % by wt
12.	Lubricating Oils, Synthetic Oils	FTIR Analysis	ASTM E 1252: 2013	NA
13.	Lubricating Oils, Metalworking Oils & Fluids, Heat Treatment Oils	Total Acidity	1448 (Part 2): 2007 (RA 2013), ISO 6619: 1988 IP 538/06	0 to 5 mgKOH/g

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14.	HSD, Furnace Oils, Quenching Oils, Metal Working Fluids	Inorganic Acidity	1448 (Part 2): 2007 (RA 2013), IP 182/06, ISO 6619: 1988	0 to 5 mgKOH/g
15.	Lubricating Oils, Metalworking Fluids	Sulphur Content	ASTM D 4294: 2016e1	0.0017 % to 4.6 % by wt
16.	Lubricating Oils, Metalworking Oils & Fluids, Heat Treatment Oils	Flash and Fire Point by Cleveland Open Cup	ASTM D 92: 2012b 1448 (Part 69): 2013 ISO 2592: 2000 IP 36	79 °C to 400 °C
		Flash Point (closed) by Pensky-Martens Apparatus	ASTM D 93: 2015a IS 1448 (Part 21): 2012 IP 35/63: 2001	40 °C to 360 °C
		Ash Content	ASTM 482 : 2013a IS 1448 (Part 4): 2008 (RA 2013) ISO 6245, IP 04	0 to 3 % by wt
17.	Lubricating Oils & Fluids, Metalworking Oils & Fluids, Heat Treatment Oils, Thermic Fluids	Water Content by Distillation	ASTM D 95: 2013e1 IS 1448 (Part 40): 1987 (RA 2016) IP 74	0 to 25 % by Vol
18.	Lubricating Oils & Fluids	Sulphated Ash	ASTM D 874: 2013a 1448 (Part 4): 2008 (RA 2016) ISO 6245, IP 163/96: 2003	0 to 5 % by wt

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19.	Furnace Oils, LSHS, Thermic Fluid, Quenching Oils	Conradson Carbon Residue of Petroleum Products	ASTM D 189: 2014 IS1448 (Part 122): 2013 ISO 6615: 1993	Nil to 30 % by wt
20.	Lubricating Oils, Transformer Oils, Metalworking Oils & Fluids, Heat Treatment Oils, Thermic Fluids	Pour Point	ASTM D 97: 2016 IS 1448 (Part 10, Sec II): 2013, IP 15/95: 2004	(-)30 to 35 °C
		Density, relative density by hydrometer method	ASTM D 1298: 2012b IS 1448 (Part 16): 1990 (RA 2013) IP 160/99	700 kg/m ³ to 1000 kg/m ³
		Density, relative density by Pyknometer	IS 1448 (Part 32): 1992 (RA 2013), IP 189/05	700 kg/m ³ to 1500 kg/m ³
		Sediments / Insolubles by Filtration	ASTM D 4055: 2013 ASTM D 7519-09	0 to 5 % by wt
21.	Lubricating Oils & Fluids, Metalworking Oils & Fluids, Heat Treatment Oils, Thermic Fluids	Insolubles in Pentane, Coagulated Insolubles in Pentane, Toluene, Hexane, Heptane	ASTM D 893-2014 CTP – 015, Issue No.01, Dt. 1.6.2016	0 to 10 % by wt
22.	Lubricating Oils, Transformer Oils, Metalworking Oils & Fluids, Heat Treatment Oils	Saponification Value	ASTM D 94: 2012 e1 IS 1448 (Part 55/Sec I): 2013 IS 1448 (Part 55/Sec II): 2013 IP 136/98: 2006	0 to 400

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23.	Thermic Fluids, Petroleum Solvents	Distillation Recovery	ASTM D 86: 2015 IS 1448 (Part 18): 1991 (RA 2016), IP 123/01	35 °C to 400 °C 1 ml to 100 ml
24.	Grease	Cone Penetration (Worked and Unworked)	ASTM D 217: 2010 IS 1448 (Part 60): 1994 (RA 2016), IP 50/88: 2001	85 to 475
		Drop Point	ASTM D 2265: 2015 IS 1448 (Part 52): 1971 (RA 2013), IP 132/96: 2004	Upto 316 °C
		Acidity & Alkalinity	IS 1448 (Part 53): 1979 (RA 2013), IP37/04	0 to 1 mgKOH/g
		Copper Corrosion	ASTM D 4048: 2010 IP 112/05	1 a to 4 c
25.	Coolants	pH	ASTM D 1287: 2011 IS 5759: 2006	0 to 14
		Freezing Point by Refract meter	ASTM D 3321: 2013	0 to (-) 42 °C
		Boiling Point/ERBP	ASTM D 1120: 2011e1 IS 5759: 2006	50 °C to 200 °C
		Reserve Alkalinity	ASTM D 1121: 2011 IS 5759: 2006	0 to 30 ml
		Ash Content	ASTM D 1119: 2015	0 to 5 % by wt.
		Specific Gravity	ASTM D 1122: 2013 IS 5759: 2006	1.0 g/cc to 1.5 g/cc

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	Coolants	Water Content	IS 5759: 2006, (ANNEX F), Karl Fisher Method	1.0 % to 60 %
		Foaming	ASTM D 4921: 2012 IS 5759: 2006	0 to 30 ml
II.	PETROLEUM & PETROLEUM PRODUCTS			
1.	HSD, Kerosene, LDO, Biodiesel, Marine Fuel	Kinematic Viscosity @ 40 °C	ASTM D 445: 2015a IS 1448 (Part 25): 1976 (RA 2013) IP 71 Sec. 1/97	1 cSt to 460 cSt
2.	Biodiesel, Marine Fuel, Furnace Oil, LSHS	Kinematic Viscosity @ 100 ° C	ASTM D 445: 2015a IS 1448 (Part 25): 1976 (RA 2013) IP 71 Sec. 1/97	2 cSt to 100 cSt
3.	Furnace Oil, Marine Residual Fuel, LSHS	Kinematic Viscosity @ 50 Deg C	ASTM D 445: 2015a IS 1448 (Part 25): 1976 (RA 2013) IP 71 Sec. 1/97	10 cst 500 cSt
4.	HSD, Biodiesel, Marine Fuel	Total Acid Number	ASTM D 664: 2011a ASTM D 974: 2014e1 IS 1448 (Part 1/Sec I): 2002 (RA 2007), IP 177, IP139/98: 2004 IP177/96: 2008	(0.001 to 50) mg KOH/g
5.	Biodiesel, Marine Fuel, HSD, LDO	Copper Strip Corrosion rating	ASTM D 130: 2012 IS 1448 (Part 15): 2004 (RA 2016) ISO 2160: 1998 IP 154: 2000	1 a to 4 c

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6.	HSD, LDO, Biodiesel, Marine Fuel	Water Content – Coulometric	ASTM D 6304: 2007 ISO 12937: 2000 IP 539: 06	10 mg/mg to 25000 mg/kg
		Total Acidity	1448 (Part 2): 2007 (RA 2013), ISO 6619: 1988 IP 538/06	0 to 5 mgKOH/g
7.	HSD, Marine Fuel	Particle Count and Distribution	ISO 4406, SAE 4059, ASTM D 6786: 2008 ASTM D 7619: 2012b NAS 1638 ASTM D 7647: 2010	Particles $\geq 4 \mu$ - 0 to 28 ISO Code Particles $\geq 6 \mu$ - 0 to 28 ISO Code Particles $\geq 14 \mu$ - 0 to 28 ISO NAS 1 to NAS > 12
8.	HSD, LDO, Biodiesel, Furnace Oil, LSHS, Marine Fuels	Sulphur Content	ASTM D 4294: 2016e1	0.0017 % to 4.6 % by wt
9.	Biodiesel, Marine Fuel, Furnace Oil, LSHS, HSD, Kerosene, LDO	Flash Point (closed) by Pensky-Martens Apparatus	ASTM D 93: 2015a IS 1448 (Part 21): 2012 IP 35/63: 2001	40 °C to 360 °C
10.	Petroleum Solvents, Kerosene, HSD	Flash Point (closed) by Abel Apparatus	IS1448 (Part 20): 1998 (RA 2013) IP 170/99	(-)15 °C to 70 °C
11.	Biodiesel, Marine Fuel, Furnace Oil, LSHS, Grease	Water Content by Distillation	ASTM D 95: 2013e1 IS 1448 (Part 40): 1987 (RA 2016) IP 74	0 to 25 % by Vol

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12.	Bio Diesels	Sulphated Ash	ASTM D 874: 2013a 1448 (Part 4): 2008 (RA 2016) ISO 6245, IP 163/96: 2003	0 to 5 % by wt
13.	Biodiesel, Marine Fuel, Furnace Oil, LSHS, HSD, Kerosene, Grease	Ash Content	ASTM 482 : 2013a IS 1448 (Part 4): 2008 (RA 2013) ISO 6245, IP 04	0 to 3 % by wt
14.	HSD, LDO, Biodiesel, Marine Fuel	Pour Point	ASTM D 97: 2016 IS 1448 (Part 10, Sec II): 2013, IP 15/95: 2004	(-)30 to 35 °C
		Density, relative density by hydrometer method	ASTM D 1298: 2012b IS 1448 (Part 16): 1990 (RA 2013) IP 160/99	700 kg/m ³ to 1000 kg/m ³
		Density, relative density by Pyknometer	IS 1448 (Part 32): 1992 (RA 2013) IP 189/05	700 kg/m ³ to 1500 kg/m ³
15.	HSD	Cloud Point	ASTM D 2500: 2016 IP 219/94: 2004	(-)30 to 35 °C
		Cetane Index	ASTM D 4737: 2010	30 to 70
		Total Contamination	EN 12662	1mg/kg to 100 mg/kg
17.	Furnace Oil, Marine Fuel, HSD LDO, LSHS	Heat of combustion of liquid hydrocarbon fuel by Bomb calorimeter Method	ASTM D 240: 2014 IS 1448 (Part 6): 1984 (RA 2013)	3000 cal/g to 12000 cal/g
18.	Furnace Oil, HSD, LDO, LSHS, Marine Fuel	Heat of combustion of liquid hydrocarbon fuel by Calculation	ASTM D 4868: 2010 IS 1448 (Part 7): 2004 (RA 2016)	3000 cal/g to 12000 cal/g

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19.	Furnace Oil, LDO, LSHS, Marine Fuel	Sulphur by Bomb Method	ASTM D 129 : 2013 IS 1448 (Part 33): 1991 (RA 2013), IP 61/99	0.05 % to 5 % by wt
		Chlorine Content by Bomb Method	ASTM D 808-11	0.1 % to 5 % by wt
20.	Furnace Oils, Marine Fuels, LSHS	Asphaltenes	ASTM D 6560: 2012 IS 1448 (Part 22): 1985 (RA 2013) IP 143/04	0.1 % to 15 % by wt
21.	Marine Fuels	CCAI (Calculated Carbon Aromaticity Index)	CTP-094, Issue No.01, Dt. 1.6.2016 (Calculation Method)	750 to 900
22.	Gasoline, HSD, Marine Fuel,	Distillation Recovery	ASTM D 86: 2015 IS 1448 (Part 18): 1991 (RA 2016), IP 123/01	35 °C to 400 °C 1 ml to 100 ml
23.	HSD, LDO	Carbon Residue by Rams bottom method	ASTM D 524 : 2015 IS 1448 (Part 8): 2012 ISO 4262: 1993 IP14/94: 2004	0.01 % to 5 % by wt
		Sediments by extraction	ASTM D 473: 2012 e1 IS 1448 (Part 30): 2013 ISO 3735: 1999, IP 53: 2000	0 to 3 % by wt
24.	HSD, Marine Fuels	Determination of Cold Filter Plugging Point	ASTM D 6371: 2010 IS 1448 (Part 110): 1981 (RA 2013) IP 309/99	(-)20°C to (+)20 °C

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