

Laboratory Centre for Applied Research and Development (CARD), NLC India Limited, Neyveli, Cuddalore District, Tamil Nadu
Accreditation Standard ISO/IEC 17025: 2005
Certificate Number TC-6175 **Page 1 of 5**
Validity 16.08.2018 to 15.08.2020 **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.	SOLID FUEL			
1.	Coal (Lignite)	Proximate analysis	IS 1350 (Part I)	
		Moisture		0.5 % to 55 %
		Ash		0.5 % to 20 %
		Volatile Matter		5 % to 60 %
		Gross Calorific Value (GCV)	IS 1350 (Part-2)	1000 kcal/kg to 8000 kcal/kg
II.	BUILDING MATERIALS			
1.	Fly ash	Loss on Ignition	IS 1727	0.5 % to 10.0 %
		Silica		30.0 % to 90.0 %
		Iron oxide		0.50 % to 20.0 %
		Alumina		5.0 % to 35.0 %
		Calcium oxide		5.0 % to 25.0 %
		Magnesium oxide		0.5 % to 5.0 %
		Sulphuric anhydride		0.2 % to 5.0 %
III.	PETROLEUM AND PRODUCTS			
1.	Lubricating oil	Density @ 15 °C	IS 1448 (Part-16)	0.80 g/ml to 1.5 g/ml
		Kinematic Viscosity @ 40 °C	IS 1448 (Part-25)	35.0 cSt to 400.0 cSt
		Total Acidity (mg of KOH/gm of oil)	IS 1448 (Part-2)	0.1 % to 5.0 %
		Flash point (PMCC)	IS 1448 (Part-21)	40.0 °C to 300 °C
2.	Furnace oil	Density @ 15 °C	IS 1448 (Part-16)	0.80 g/ml to 1.0 g/ml
		Kinematic Viscosity @ 50 °C	IS 1448 (Part-25)	100.0 cSt to 300.0 cSt
		Total Acidity (mg of KOH/gm of oil)	IS 1448 (Part-2)	0.1 % to 5.0 %

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		Water Content (percent by volume)	IS 1448 (Part-40)	0.5 % to 8.0 %
		Gross Calorific Value (cals/gram)	IS 1448 (Part-7)	9000 cal/g to 11000 cal/g
IV.	METALLIC COATING AND TREATMENT SOLUTIONS			
1	Metalic coatings GI wire & plate	Mass of Zinc Coating	IS 6745	10 g/m ² to 1000 g/m ²
V.	ATMOSPHERIC POLLUTION			
1.	Ambient Air Quality Monitoring	Respirable suspended particulate matter (PM ₁₀)	IS 5182 (Part-23)	5 µg/m ³ to 1000 µg/m ³
		Sulphur Dioxide (SO ₂)	IS 5182 (Part-2)	5 µg/m ³ to 1000 µg/m ³
		Oxides of Nitrogen (NO _x)	IS 5182 (Part-6)	10 µg/m ³ to 1000 µg/m ³
		Ambient Noise level	IS 9989	30 dB (A) to 130 dB (A)
VI.	POLUTION & ENVIRONMENT			
1.	Effluent Water	Calcium as Ca	IS 3025 (Part-40)	1 mg/L to 2000 mg/L
		Magnesium as Mg	IS 3025 (Part-40)	1 mg/L to 2000 mg/L
		Chloride as Cl	IS 3025 (Part-32)	1 mg/L to 2000 mg/L
		Sulphate as SO ₄	IS 3025 (Part-24) (Gravimetric Method)	10 mg/L to 2000 mg/L
		Total Alkalinity as CaCO ₃	IS 3025 (Part-23)	1 mg/L to 2000 mg/L
		Total Hardness as CaCO ₃	IS 3025 (Part-21)	1 mg/L to 2000 mg/L
		pH @ 25°C	IS 3025 (Part-11)	2 to 12
		Sodium as Na	IS 3025 (Part-45)	10 mg/L to 1000 mg/L
VII.	WATER			
1.	Ground water, Bore well, Surface water	Calcium as Ca	IS 3025 (Part-40)	1 mg/L to 1000 mg/L
		Magnesium as Mg	IS 3025 (Part-46)	1 mg/L to 1000 mg/L
		Chloride as Cl	IS 3025 (Part-32)	1 mg/L to 1000 mg/L
		Sulphate as SO ₄	IS 3025 (Part-24) (Gravimetric Method)	10 mg/L to 1000 mg/L

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		Total Alkalinity as CaCO ₃	IS 3025 (Part-23)	1 mg/L to 1000 mg/L
		Total Hardness as CaCO ₃	IS 3025 (Part-21)	1 mg/L to 1000 mg/L
		pH @ 25°C	IS 3025 (Part-11)	2 to 12
		Sodium as Na	IS 3025 (Part-45)	10 mg/L to 500 mg/L
VIII. METALS & ALLOYS				
1.	Plain Carbon Steel & Low Alloy Steel	Carbon	IS 8811 ASTM E 415 (Optical Emission Spectrometric method)	0.17 % to 1.311 %
		Silicon		0.111 % to 0.2091 %
		Manganese		0.228 % to 1.677 %
		Phosphorus		0.0161 % to 0.055 %
		Sulphur		0.0138 % to 0.0381 %
		Chromium		0.010 % to 0.652 %
		Nickel		0.007 % to 0.808 %
		Molybdenum		0.088 % to 0.140 %
		Vanadium		0.194 % to 0.341 %
2.	High Alloy steel Stainless steel	Carbon	IS 9879 ASTM E 1086 (Optical Emission Spectrometric method)	0.0103 % to 0.8550 %
		Silicon		0.318 % to 0.3744 %
		Manganese		0.621 % to 0.686 %
		Phosphorus		0.0053 % to 0.035 %
		Sulphur		0.0051 % to 0.046 %
		Chromium		7.00 % to 26.00 %
		Nickel		0.706 % to 6.1242 %
3.	Gun Metal/ Bronze	Molybdenum	BSEN 15079 OES (Optical Emission Spectrometric method)	0.0138 % to 1.24 %
		Copper		74.36 % to 99.82 %
		Tin		1.63 % to 9.47 %
		Lead		0.575 % to 6.07 %
		Iron		0.0019 % to 0.354 %
		Nickel		0.168 % to 1.98 %
		Zinc		0.0008 % to 22.13 %
		Phosphorus		0.060 % to 0.250 %

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<u>MECHANICAL TESTING</u>				
I.	MECHANICAL PROPERTIES OF METALS			
1.	Hot rolled low, medium and high tensile structural steel.	Tensile strength	IS 1608	50 kN to 1000 kN
		Yield strength	IS 1608	50 kN to 1000 kN
		% Elongation	IS 1608	10 % to 30 %
2.	High strength deformed steel bars and wires for concrete reinforcement.	Tensile strength	IS 1608	50 kN to 1000 kN
		Yield strength	IS 1608	50 kN to 1000 kN
		% Elongation	IS 1608	10 % to 30 %
3.	Fasteners: Bolt and Nut Beater Plates	Brinell Hardness test	IS 1500 (Part-1)	225 HBW to 430 HBW 10/3000
4.	Tungsten Carbide Inserts Rotary drill bits Chromium & Nickel Coated Material	Vickers Hardness test	IS 1501 (Part-1)	300 HV5 to 700 HV5
				300 HV10 to 700 HV10
				300 HV30 to 1300 HV30
5.	Track link Pins Bolt & Nuts HSS Hard-facing materials	Rockwell Hardness test	IS 1586	35 HRA to 65 HRA
		A scale		20 HRB to 70 HRB
		B scale		30 HRC to 65 HRC
II.	PLASTICS AND PLASTIC PRODUCTS			
1.	Plastics (Hard Rubber)	Shore Hardness D	IS:13360 (Part-5/Sec.11)	30 Shore D to 90 Shore D
III.	RUBBER AND RUBBER PRODUCTS			
1.	Vulcanized Rubber (Soft rubber)	Shore Hardness A	IS 3400 (Part-23)	10 Shore A to 90 Shore A

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2.	Conveyor Belts	Breaking strength Longitudinal direction Transverse direction	IS 1891 (part-1)	200 kN/m to 2600 kN/m 200 kN/m to 1500 kN/m
IV.	BUILDING MATERIALS			
1.	Cement	Standard Consistency	IS 4031 (Part 4)	20 % to 40 %
		Initial Setting Time	IS 4031 (Part 5)	30 min. to 300 min.
		Final Setting Time	IS 4031 (Part 5)	200 min. to 415 min.
		Compressive Strength	IS 4031 (Part 6)	10 N/mm ² to 80 N/mm ²
		Density	IS 4031 (Part 11)	2.70 g/cc to 3.50 g/cc
2.	Fine Aggregate	Sieve Analysis	IS 2386 (Part 1)	0.01 % to 100 %
		Specific gravity	IS 2386 (Part 3)	2.0 to 3.5
		Water Absorption	IS 2386 (Part 3)	1.0 to 4.0