

Laboratory **Chemical and Metallurgical Laboratory, Material Technology Centre,
Loco Workshop, Perambur, Chennai, Tamil Nadu**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-7120**

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Validity **13.04.2018 to 12.04.2020**

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.	METALS AND ALLOYS			
1.	Low Alloy Steel	Carbon	IS 8811: 1998 (RA 2012)	0.08% to 0.7%
		Manganese		0.19% to 0.56%
		Silicon		0.6% to 1.18%
		Sulphur		0.01% to 0.04%
		Phosphorous		0.014% to 0.074%
		Chromium		0.77% to 3.0%
		Nickel		0.39% to 3.0%
		Molybdenum		0.3% to 0.8%
		Copper		0.2% to 0.44%
		Vanadium		0.008% to 0.44%
2.	Stainless steel	Carbon	IS 9879: 1998 (RA 2015)	0.056% to 0.07%
		Manganese		0.4% to 1.39%
		Silicon		0.39% to 0.51%
		Sulphur		0.01% to 0.03%
		Phosphorous		0.01% to 0.026%
		Chromium		4.2% to 24.92%
		Nickel		0.32% to 19.55%
		Molybdenum		0.23% to 2.5%
		Copper		0.1% to 1.8%
		Vanadium		0.04% to 0.092%
3.	Aluminium & Its Alloys	Silicon	ASTM E 1251-17	0.5% to 8.9%
		Iron		0.6% to 0.8%
		Manganese		0.01% to 0.04%
		Magnesium		0.04% to 2.89%
		Zinc		0.04% to 0.37%
		Copper		0.05% to 1.87%
4.	Copper & Its alloys	Lead	BS EN 15079:2015	0.0052% to 5.13%
		Tin		0.0002% to 5.22%
		Iron		0.0005% to 0.14%

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		Nickel		0.0002% to 1.0%
		Zinc		0.003% to 38.8%
II.	PAINTS & SURFACE COATING			
1.	Paints & Enamels	Drying Time	IS 101 (Part 3/Sec 1): 1986 (RA 2012)	Up to 12 h
		Consistency	IS 101 (Part 1/Sec 5): 1989 (RA 2009)	60 s to 120 s
		Mass	IS 101 (Part 1/Sec 7): 1987 (RA 2009)	8.5 kg/10L to 18 kg/10L
		Volume Solids	IS 101 (Part 8/Sec 6): 1993 (RA 2009)	30% to 80%
		Wet Opacity	IS 101 (Part 4/Sec 1): 1988 (RA 2009)	100 m ² /10L to 500 m ² /10L
		Scratch Hardness	IS 101 (Part 5/Sec 2): 1988 (RA 2009)	Qualitative
		Gloss value at 60°	IS 101 (Part 4/Sec 4): 1988 (RA 2012)	5 Gloss to 120 Gloss
		Fineness of grind	IS 101 (Part 3/Sec 5): 1987 (RA 2009)	5 Micron to 100 Micron
		Flash point	IS 101 (Part 1/Sec 6): 1987 (RA 2009)	20°C to 50°C
		Flexibility & Adhesion	IS 101 (Part 5/Sec 2): 1988 (RA 2009)	Qualitative
		Accelerated Storage stability test	IS 8662: 2004 (RA 2009)	Qualitative
		Pigment content	IS 101 (Part 8/Sec 2): 1990 (RA 2012)	1% to 60%
		Resistance to 5% H ₂ SO ₄	ICFMDSpec 045, Annexure A	Qualitative
		Resistance to 5% Na ₂ CO ₃	ICFMDSpec 045, Annexure B	Qualitative

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		Volatile matter	IS 101(Part 2/Sec 2): 1986 (RA 2012)	10% to 99%
		Dry Film Thickness	IS 101 (Part 3/Sec 2): 1989 (RA 2009)	10 Microns to 200 Microns

Sreeram Pinnamaraju
Convenor

N. Venkateswaran
Program Director

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ELECTRICAL TESTING

I.	INSULATING MATERIALS & INSULATORS			
	LIQUID DIELECTRIC MATERIALS- Transformer Oil (Mineral Insulating Oil)	Dissolved Gas Analysis		
		Acetylene	IS 10593: 2006 (RA 2011) IS 9434: 1992 (RA 2013)	1 ppm to 150 ppm
		Carbon dioxide		1 ppm to 12000 ppm
		Hydrogen		1 ppm to 300 ppm
		Ethane		1 ppm to 1000 ppm
		Ethylene		1 ppm to 400 ppm
	Methane	1 ppm to 300 ppm		

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS				
1.	Ferrous, Aluminium, Copper metals, alloys & products	Tensile Strength		IS 1608: 2005 (RA 2017)	100 MPa to 750 MPa (20 kN to 1000 kN)Load
		% Elongation			5% to 60%
		Brinell Hardness	HBW 10/3000	IS 1500 (Part 1): 2013	140 HBW to 500 HBW 10/3000
			HBW 5/750		100 HBW to 500 HBW 5/750
		Rockwell Hardness (HRBW)		IS 1586 (Part 1): 2012 (RA 2017)	55 HRBW to 100 HRBW
		Rockwell Hardness (HRC)			20 HRC to 70 HRC
		Vickers Hardness (HV5)		IS 1501 (Part 1): 2013	120 HV5 to 900 HV5
Vickers Hardness (HV30)			200 HV30 to 1000 HV30		
II.	METALLOGRAPHY TEST				
1.	Steel and cast iron Materials and Products	Microstructure	ASTM handbook Atlas of Microstructure Vol No. VII, 8 th Edition IS 7739 (Part 1)-1975 (RA 2010)	Qualitative 50X, 100X,250X and 500X	
2.	Cast Iron material and products	Microstructure of graphite	IS 7754: 1975 (RA 2012)	Qualitative 100X	

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NON DESTRUCTIVE TESTING

I.	METALS AND ALLOYS			
1.	Various types of axles & Discs (Forged Components)	Ultrasonic Testing - Detection of internal Flaws	RDSO/M&C Test method :-	7mm to 2500mm
1) k-405/ Revised on May 2017				
2) MC-34/Revised on May 2017				
3)MC-111/Revised on Oct 2006				
4) MC-95/Revised on Mar 2006				
5) MC-11/Revised on Sep 1991				
6) MC-13/Revised on May 1999				
7) MC-162/ Revised on Mar 2014				
8) MC-7/Revised on Sep 2007			7mm to 3000mm	
9) IRS-R-34/2003	7mm to 200mm			
2.	Roller Bearing of coaches	Penetrant Testing - Fluorescent Water Washable	CMT/NDT/TP/PT/01 Issue No. 1 Date 06.02.2018	Qualitative