

Laboratory Chemical & Metallurgical Testing Laboratory, Northern Railway,
Charbagh Workshop, Lucknow (NRC), Lucknow, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8286

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Validity 18.01.2019 to 17.01.2021

Last Amended on 22.04.2019

"In view of the transition for ISO/IEC 17025:2017, the validity of this accreditation certificate will cease on 30.11.2020"

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 & ALLOYS			
1.	Alloy Steel	Aluminium	ASTM E415:2017	0.005 % to 0.1 %
		Carbon	ASTM E415:2017	0.005 % to 1.5 %
		Chromium	ASTM E415:2017	0.005 % to 4.0 %
		Copper	ASTM E415:2017	0.005 % to 0.5 %
		Manganese	ASTM E415:2017	0.005 % to 2.0 %
		Molybdenum	ASTM E415:2017	0.007 % to 1.0 %
		Nickel	ASTM E415:2017	0.005 % to 5.0 %
		Phosphorous	ASTM E415:2017	0.005 % to 0.085 %
		Silicon	ASTM E415:2017	0.05 % to 1.5 %
		Sulphur	ASTM E415:2017	0.001 % to 0.060 %
2.	Aluminium & Its Alloy	Iron	ASTM E1251:2017	0.1 % to 0.8 %
		Chromium	ASTM E1251:2017	0.008 % to 0.2 %
		Copper	IS 504 (Part 3): 2018	0.01 % to 6.0 %
		Iron	IS 504 (Part 2): 2018	0.01 % to 1.50 %
		Magnesium	ASTM E1251:2017	0.03 % to 3.0 %
		Magnesium	IS 504 (Part 6): 2018	0.01 % to 6.00 %
		Manganese	ASTM E1251:2017	0.015 % to 1.0 %
		Nickel	ASTM E1251:2017	0.01 % to 1.0 %
		Nickel	IS 504 (Part 7): 2018	0.01 % to 1.00 %
		Silicon	ASTM E1251:2017	0.070 % to 16.00 %
		Silicon	IS 504 (Part 1): 2018	0.01 % to 10.00 %
		Tin	ASTM E1251:2017	0.01 % to 0.050 %
		Zinc	ASTM E1251:2017	0.015 % to 5.7 %
Zinc	IS 504 (Part 4): 2018	0.01 % to 4.00 %		
3.	Carbon Steel	Sulphur	IS 228 (Part 09): 2014	0.005 % to 0.090 %
		Manganese	IS 228 (Part 2): 2018	0.010 % to 3.00 %
		Phosphorous	IS 228 (Part 3): 2018	0.005 % to 0.090 %

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4.	Copper & its Alloy	Silicon	IS 228 (Part 8): 2014	0.010 % to 3.00 %
		Nickel	BS EN15079:2015	0.005 % to 4.0 %
		Arsenic	BS EN15079:2015	0.010 % to 0.3 %
		Copper	IS 4027 (Part 1): 2012	0.010 % to 99.90 %
		Iron	BS EN15079:2015	0.020 % to 2.0 %
		Lead	BS EN15079:2015	0.05 % to 9.0 %
		Lead	IS 3685:2018	0.01 % to 10.00 %
		Nickel	IS 4027 (Part 1): 2012	0.01 % to 2.00 %
		Phosphorous	BS EN15079:2015	0.005 % to 1.0 %
		Sulphur	BS EN15079:2015	0.008 % to 0.07 %
		Tin	BS EN15079:2015	0.05 % to 12 %
		Tin	IS 4027 (Part 5): 2018	0.01 % to 10.00 %
		Zinc	BS EN15079: 2015	0.05 % to 40.0 %
5.	Stainless Steel	Zinc	IS 4027 (Part 6): 2018	0.01 % to 50.0 %
		Carbon	IS 228 (Part 1): 2008	0.010 % to 2.7 %
		Chromium	IS 228 (Part 6): 2014	0.10 % to 20.00 %
		Manganese	IS 228 (Part 2): 2018	0.010 % to 2.00 %
		Molybdenum	IS 228 (Part 7): 2018	0.10 % to 3.00 %
		Nickel	IS 228 (Part 5): 2014	0.10 % to 10.00 %
		Phosphorous	IS 228 (Part 3): 2018	0.005 % to 0.50 %
		silicon	IS 228 (Part 8): 2014	0.010 % to 2.50 %
		Sulphur	IS 228 (Part 9): 2014	0.005 % to 0.50 %
6.	Tool Steel	Carbon	JIS-G:1253: 2013	0.001 % to 4.5 %
		Chromium	JIS-G:1253: 2013	0.001 % to 35.0 %
		Cobalt	JIS-G:1253: 2013	0.001 % to 18 %
		Manganese	JIS-G:1253: 2013	0.001 % to 20.0 %
		Molybdenum	JIS-G:1253: 2013	0.001 % to 10.0 %
		Phosphorous	JIS-G:1253: 2013	0.001 % to 1.0 %
		Silicon	JIS-G:1253: 2013	0.001 % to 4.0 %
		Sulphur	JIS-G:1253: 2013	0.001 % to 0.20 %
		Tin	JIS-G:1253: 2013	0.001 % to 0.15 %
		Tungston	JIS-G:1253: 2013	0.001 % to 25.0 %

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7.	Stainless Steel	Vanadium	JIS-G:1253: 2013	0.001 % to 5.0 %
		Carbon	IS 9879:1998	0.005 % to 0.3 %
		Chromium	IS 9879:1998	5.0 % to 26.0 %
		Manganese	IS 9879:1998	0.005 % to 1.8 %
		Molybdenum	IS 9879:1998	0.005 % to 4.0 %
		Nickel	IS 9879:1998	5.0 % to 22.0 %
		Phosphorous	IS 9879:1998	0.001 % to 0.05 %
		Silicon	IS 9879:1998	0.005 % to 0.6 %
		Sulphur	IS 9879:1998	0.001 % to 0.050 %
		Vanadium	IS 9879:1998	0.005 % to 0.4 %

Amit Kumar
Convenor

Anuja Anand
Program Manager

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Metallic Material	Hardness (Brinell hardness testing @3000 kg)	IS 1500 (Part 1): 2013	100 HBW 10/3000 to 500 HBW 10/3000
		Hardness (Rockwell B-scale)	IS 1586:2018	20 HRB to 100 HRB
		Hardness (Rockwell C-scale)	IS 1586:2018	20 HRC to 70 HRC
2.	Weld Plate	Bend test	IS1599:2012 (RA 2017)	Qualitative (bend at 180 degree)
II.	METALLOGRAPHY TEST			
1.	Aluminium Components	Macro etch test	IS 12573:2016	Qualitative (5xMagnification)
2.	Copper and Its Alloy Material	Macro etch test	IS 13484:2018	Qualitative (5xMagnification)
3.	Ferrous Material	grain size measurement by comparison method	IS 4748:2009	Qualitative (100xMagnification)
		Macro etch test	IS 13015:2018	Qualitative (10xMagnification)
4.	Ferrous Material-Cast Iron & Steel	Microstructure	IS 7739 & ASM HandBook volume 9:2012 & 2004	Qualitative (100xMagnification)
5.	Steel	Determination of case depth by macroscopic method	IS 6416:2012	Qualitative (01 to 03 mm/100x Magnification)
		Non metallic inclusion rating by Method "A"	IS 4163:2012	Qualitative (100xMagnification)
6.	Weldments	Macro etch test	IS 13015:2018	Qualitative (5xMagnification)

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III.	PLASTICS AND PLASTIC PRODUCTS			
1.	Plastic Material	Hardness (Shore D)	IS 3400 (Part 2): 2014	10 shore D to 100 shore D
IV.	RUBBER AND RUBBER PRODUCTS			
1.	Rubber Products	Hardness (Shore A)	IS 3400 (Part 2): 2014	10 shore A to 95 shoreA

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NON - DESTRUCTIVE TESTING

I.	METALS & ALLOYS			
1.	Crank Shaft & other Components	Magnetic Particle Testing. Stationary Method. Fluorescent dye.	IS 3703:2014	Qualitative (Range: Defects Upto 3 mm depth from the surface.)
2.	ICF-COACH AXLE	Ultrasonic Testing	COP-MC-34:2017	Qualitative
3.	LHB (Linkehofmannbusch)-Coach AXLE	Ultrasonic Testing	COP-MC-85:2017	Qualitative
4.	Metal components	Liquid Penetrant Testing. visible technique. Red dye.	IS 11732:2017	Qualitative (Range: Defects open to surface.)
5.	Motor Coach AXLE-95	Ultrasonic Testing	COP-MC-95:2006	Qualitative
6.	Motor Coach AXLE-111	Ultrasonic Testing	COP-MC-111:2006	Qualitative
7.	Roller bearing & other Metal Components (Zyglo Testing)	Liquid Penetrant Testing. Fluorescent Dye.	IS 3658:2014	Qualitative (Range: Defects open to surface.)
8.	TM-SHAFT (Armature shaft-TM165 & TM49)	Ultrasonic Testing	COP-K-264:2016	Qualitative
9.	Tower Wagon Axle (Non- Powered)	Ultrasonic Testing	COP-MC-50:2002	Qualitative
10.	Tower Wagon Axle (Powered)	Ultrasonic Testing	COP-MC-17:1991	Qualitative
11.	WAG5- Electric Engine AXLE	Ultrasonic Testing	COP-MC-05:1991	Qualitative

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12.	WAG7- Electric Engine AXLE	Ultrasonic Testing	COP-MC-07:1999	Qualitative
13.	WAGON AXLE (BOXN)	Ultrasonic Testing	COP-MC-15:2017	Qualitative
14.	WAP1 (TAO)- Electric Engine AXLE	Ultrasonic Testing	COP-MC-162:2014	Qualitative
15.	WAP1- Electric Engine AXLE	Ultrasonic Testing	COP-MC-08:1998	Qualitative
16.	WAP4- Electric Engine AXLE	Ultrasonic Testing	COP-MC-12:1995	Qualitative
17.	WAP5- Electric Engine AXLE	Ultrasonic Testing	COP-MC-09:2018	Qualitative
18.	WDM3A-Diesel Engine AXLE	Ultrasonic Testing	COP-MC-42:2001	Qualitative
19.	WDM3D-Diesel Engine AXLE & WDG3A- Diesel Engine AXLE	Ultrasonic Testing	COP-MC-91:2017	Qualitative
20.	WDP1-Diesel Engine AXLE	Ultrasonic Testing	COP-MC-03:1999	Qualitative
21.	WDP3A-Diesel Engine AXLE	Ultrasonic Testing	COP-MC-90:2005	Qualitative
22.	WDP4-Diesel Engine AXLE & WDG4-Diesel Engine AXLE	Ultrasonic Testing	COP-MC-71:2004	Qualitative

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