

Laboratory	Material Testing Laboratory, Rifle Factory, Ishapore, P. O. Nawabganj-Ishapore, Dist 24 Parganas (N), West Bengal		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	08.12.2014
Certificate Number	T-0362	Valid Until	07.12.2016
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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. METALS AND ALLOYS				
1.	Iron, steel and ferro-alloys			
a)	Low Alloy Steel	Carbon Manganese Silicon Phosphorus Sulphur Nickel Chromium Molybdenum Vanadium Copper Aluminium	ASTM E 415-2014, IS 8811: 1988 (RA 2012) (By Direct Reading Optical Emission Spectrometer.)	0.010 % to 1.310 % 0.20 % to 1.70 % 0.040 % to 1.20 % 0.004 % to 0.050 % 0.002 % to 0.060 % 0.015 % to 4.20 % 0.015 % to 1.60 % 0.005 % to 0.60 % 0.003 % to 0.50 % 0.020 % to 0.70 % 0.014 % to 0.350%
b)	Stainless Steel	Carbon Manganese Silicon Phosphorus Sulphur Nickel Chromium Molybdenum Vanadium Copper Aluminium	ASTM E 1086-2014, IS 9879 : 1998 (RA 2010) (By Direct Reading Optical Emission Spectrometer.)	0.01 % to 1.150 % 0.20 % to 19.50 % 0.20 % to 1.80 % 0.010 % to 0.050 % 0.005 % to 0.051 % 0.060 % to 20.00 % 11.0 % to 25.0 % 0.050 % to 0.50 % 0.015 % to 0.350 % 0.030 % to 0.150 % 0.015 % to 0.055%

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c)	Tool Steel	Carbon	WI. NO. 6002400	0.650 % to 1.10 %
		Manganese	Dt.18.12.2010	0.250 % to 0.750 %
		Silicon		0.10 % to 0.350 %
		Phosphorus		0.010 % to 0.060 %
		Sulphur		0.010 % to 0.060 %
		Nickel		0.120 % to 0.750 %
		Chromium		3.50 % to 5.50 %
		Molybdenum		0.10 % to 9.50 %
		Vanadium		0.60 % to 1.850 %
		Cobalt Tungsten		0.020 % to 10.70 % 1.70 % to 19.00 %
d)	Iron, Steel	Carbon (By Strohlein's apparatus)	IS 228 (Part 1):1987 (RA 2012)	0.05 % to 2.50 %
		Manganese	IS 228 (Part 2):1987 (RA 2012)	0.10 % to 2.50 %
		Silicon	ASTM E 350: 2012	0.01 % to 3.50 %
		Phosphorus	ASTM E 350: 2012	0.02 % to 0.25 %
		Sulphur	IS 228 (Part 9): 1989 (RA: 2009)	0.01 % to 0.25 %
		Nickel	IS 228 (Part 5): 1987 (RA: 2009)	0.10 % to 5.00 %
		Chromium	ASTM E 350: 2012	0.10 % to 5.00 %
		Molybdenum	ASTM E 30, Vol. 3.05	0.15 % to 5.00 %
		Vanadium	ASTM E 30, Vol. 3.05	0.15 % to 3.00 %
Copper	IS 228 (Part 15): 1992 (RA 2009)	0.10 % to 0.50 %		
e)	Special Steel	Stainless Steel	IS 228(Part 1) 1987 (RA 2012)	
		C	ASTM E 350: 2012	0.05 % to 0.35 %
		Si	ASTM E 353: 2006	0.50 % to 3.00 %
		Cr	IS 228(Part 5): 1987 (RA: 2009)	1.00 % to 30.0 %
		Ni		1.00 % to 20.0 %

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f)	Tool Steel	Tool Steel	IS 228(Part 1): 1987 (RA 2012)	
		C	ASTM E 352 -2013	0.05 % to 2.50 %
		Cr	ASTM E30, Vol. 3.05	0.50 % to 15.0 %
		V	ASTM E30, Vol. 3.05	0.50 % to 3.50 %
		Mo	W. I. No : 6000801 dt.19.03. 2004	3.50 % to 10.0 %
		W	W. I. No: 6001001dt. 19.03. 2004	0.30 % to 25.0 %
		Co		1.00 % to 10.0 %

II. ALUMINIUM & ITS ALLOYS

a)	Aluminium Base	Magnesium	ASTM E 1251:2011	0.050 % to 1.00 %
		Manganese		0.004 % to 0.50 %
		Silicon		0.090 % to 12.00 %
		Iron		0.050 % to 0.850 %
		Zinc		0.10 % to 6.00 %
		Nickel		0.008 % to 1.850 %
		Chromium		0.005 % to 0.130 %
		Lead		0.002 % to 0.220 %
		Tin		0.070 % to 0.130 %
		Copper		0.010 % to 4.70 %
		Titanium		0.014 % to 0.20 %
b)	Aluminium & its alloys	Silicon	IS 504 (Part 1) 2002 (RA 2010)	0.30 % to 12.0 %
		Manganese	IS 504 (Part 5) 2002 (RA 2010)	0.10 % to 1.00 %
		Copper	IS 504 (Part 3) 2003 (RA 2010)	0.10 % to 5.00 %
		Zinc	IS 504 (Part 4) 2002 (RA 2010)	0.10 % to 6.00 %
		Iron	IS 504 (Part 2) 2000 (RA 2010)	0.10 % to 2.00 %
		Magnesium	IS 504 (Part 6) 2002 (RA 2010)	0.10 % to 3.00 %
		Nickel	IS 504 (Part 7) 2002 (RA 2010)	0.10 % to 1.50 %

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III. METALLIC COATINGS AND TREATMENT SOLUTIONS				
a)	Metallic coating and treatment solution	Hexavalent Cr (as CrO ₃)	W.I. No.- 6001401 Dt. 19.03.2004	100 g/L to 300 g/L
		Trivalent Cr (as Cr ₂ O ₃)		5 g/L to 25 g/L
		Sulphate as H ₂ SO ₄		1 g/L to 5 g/L
		Total Oxide		1 g/L to 25 g/L
b)	Phosphate Solution	Ferrous Iron Concentration	JSS 0465: 01'97	0.006 to 0.50 %

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