

Laboratory **Metal & Steel Factory Testing Laboratory, Ishapore, P. O. Nawabganj, North 24 Paraganas, West Bengal**

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

Certificate Number **TC-7280 (in lieu of T-0266 & T-0267)**

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Validity **11.01.2018 to 10.01.2020**

Last Amended on **18.05.2018**

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.	METAL & ALLOYS			
1.	Carbon & low Alloy Steel	Carbon (C)	ASTM E-415- 2017	0.02 to 1.10 %
		Sulphur (S)		0.010 to 0.05%
		Silicon (Si)		0.004 to 1.15%
		Phosphorus (P)		0.005 to 0.05%
		Nickel (Ni)		0.02 to 5.0%
		Manganese (Mn)		0.10 to 1.68%
		Chromium (Cr)		0.08 to 2.25%
		Molybdenum (Mo)		0.02 to 1.15%
		Vanadium (V)		0.015 to 0.3%
		Copper (Cu)		0.05 to 0.5%
		Aluminium (Al)		0.01 to 0.093%
		Boron (B)		0.001 to 0.007%
		Titanium (Ti)		0.008 to 0.13%
		Tin (Sn)		0.01 to 0.045%
2.	Stainless Steel	Carbon (C)	ASTM E-1086-2014 IS 9879-1998(RA-2015)	0.06 to 0.16 %
		Sulphur (S)		0.01 to 0.03%
		Silicon (Si)		0.30 to 0.90%
		Phosphorus (P)		0.010 to 0.03%
		Nickel (Ni)		7.5 to 13.0 %
		Manganese (Mn)		0.70 to 1.59%
		Chromium (Cr)		17.0 to 23.0%
3.	Tool Steel	Carbon (C)	ASTM E 305-2013 By Direct Reading O.E. Spectrometer (MSF /T.LABY/ SOP NO. 21/D)	0.60 to 0.89 %
		Sulphur (S)		0.02 to 0.043%
		Silicon (Si)		0.10 to 0.42%
		Phosphorus (P)		0.015 to 0.046%
		Manganese (Mn)		0.12 to 0.50%
	Chromium (Cr)	3.21 to 4.53%		

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		Molybdenum (Mo)		0.17 to 5.23%
		Vanadium (V)		0.52 to 1.91%
		Tungsten (W)		10.8 to 22.4 %
		Cobalt (Co)		0.13 to 10.2%
4.	Copper Base Alloys Such as Leaded Brass, Cartg. Brass, Gun Metal.	Iron (Fe)	ASTM E 305-2013 By Direct Reading O.E. Spectrometer (MSF /T.LABY/ SOP NO. 21/B)	0.010 to 0.5%
		Lead (Pb)		0.01 to 5.13%
		Tin (Sn)		0.02 to 8.20%
		Arsenic (As)		0.01 to 0.035%
		Nickel (Ni)		0.005 to 5.0%
		Zinc (Zn)		0.003 to 40.0%
		Antimony (Sb)		0.0025 to 0.30%
	Bismuth (Bi)		0.004 to 0.07%	
5.	Zinc Base Alloy	Magnesium (Mg)		0.04 to 0.1%
		Aluminium (Al)	ASTM E 305-2013 By Direct Reading O.E. Spectrometer (MSF /T.LABY/ SOP NO. 21/C)	1.0 to 5.0%
		Iron (Fe)		0.015 to 0.055%
		Lead (Pb)		0.002 to 0.023%
		Tin (Sn)		0.001 to 0.011%
		Cadmium (Cd)		0.001 to 0.011%
Copper (Cu)	0.004 to 0.11%			

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MECHANICAL TESTING

I. METALLOGRAPHY				
1.	Steel & Brass Sample	Macro Examination	ASTM E-381-2017 ASTM A 604-2007(17) GOST 10243-1975 GOST B 19032-1973 IS: 13015- 1991(RA 2012) IS 13484-1992 (RA 2012)	Magnification:10X
2.	Steel & Brass sample	Microstructure Examination. a) Grain Size by comparison method	IS: 4748-2009 GOST 5639-1982 ASTM E-112-2013	100 X & 75 X
		b) Micro Structure by	ASM Hand Book (Vol-9) 2004	50X,100 X,200X, 500X,1000X
3.	Steel sample	c) Non Metallic Inclusion Rating	IS: 4163-2004 (RA 2017) GOST 1778-1970 ASTM E-45 –2013	Mag:100 X
		d) Depth of Decarburisation	IS-6396-2000; Cl-6 (RA 2012) GOST-1763- (2002)	Mag:100 X,500X Range: 0 to 200 Micron
I. MECHANICAL PROPERTIES OF METALS AND ALLOYS				
1.	Brass & Steel Sample	Tensile Test -Tensile Strength -% Elongation -% Reduction in area -Yield -0.2% Proof Stress	IS 1608-2005 (RA-2011)	UTM ZD-40 5-360 KN L.C: 200 N UTM ZD-10 10-90 KN L.C: 50 N Instron 100KN 5-90KN L.C-0.01 KN

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		Brinell Hardness Test	IS – 1500- (PART I)-2013	140- 500 HBW (10 / 3000)
		Charpy Impact Test: (RT to -50°C) U Notch	IS1499-1977 (RA-2015)	5-240J LC-0.2 Kg m
		V Notch	IS1757-2014	
		Izod Test	IS1598-1977 (RA -2015)	
		Fracture Toughness Test	ASTM E 399-2012 ASTM E 1820-2017	30-450KN L.C-0.01 KN

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