

Laboratory **Central Institute of Hand Tools Laboratory, G.T. Road, Bye-Pass, Jalandhar, Punjab**

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

Certificate Number **TC-7546**

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Validity **04.07.2018 to 03.07.2020**

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.	METAL & ALLOYS			
1.	Plain carbon & Low Alloy steels	Carbon (C)	ASTM E 415:2017	0.09 % to 1.35 %
		Sulphur (S)		0.02 % to 0.15 %
		Phosphorous (P)		0.02 % to 0.10%
		Manganese (Mn)		0.30 % to 2.5 %
		Silicon (Si)		0.10 % to 2.5%
		Chromium (Cr)		0.30 % to 4.0 %
		Nickel (Ni)		0.30 % to 4.0 %
		Molybdenum (Mo)		0.05 % to 1.35 %
		Tungstun (W)		0.10 % to 1.2 %
		Vanadium (V)		0.20 % to 0.80 %
		Copper (Cu)		0.09 % to 0.80 %
		Aluminium (Al)		0.03 % to 1.40 %
2.	Stainless Steel	Carbon (C)	ASTM E 1086 : 2014	0.05 % to 1.2 %
		Sulphur (S)		0.005 % to 0.050 %
		Phosphorous (P)		0.02 % to 0.050 %
		Manganese (Mn)		0.40 % to 2.00%
		Silicon (Si)		0.40 % to 1.2 %
		Chromium (Cr)		14.0 % to 28.0%
		Nickel (Ni)		0.30 % to 14.0%
Molybdenum (Mo)	0.2 % to 1.0 %			
3.	Cast Iron	Carbon (C)	ASTM E 1999 : 2011	2.50 to 3.5
		Sulphur (S)		0.02 to 0.15
		Phosphorous (P)		0.10 to 1.10
		Manganese (Mn)		0.20 to 1.25
		Silicon (Si)		1.50 to 3.0
4.	Aluminum & its Alloys	Chromium (Cr)	ASTM E 1251 : 2011	0.05 % to 0.25 %
		Iron (Fe)		0.10 % to 1.0 %
		Manganese (Mn)		0.02 % to 0.50 %
		Nickel (Ni)		0.08 % to 2.60%

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		Lead (Pb)	ASTM E 1251 : 2011	0.05 % to 0.30 %
		Magnesium (Mg)		0.10 % to 12.0%
		Silicon (Si)		0.50 % to 12.0%
		Zinc (Zn)		0.09 % to 1.5 %
		Copper (Cu)		0.05 % to 4.5 %
		Titanium (Ti)		0.05 % to 0.25 %
5.	Copper & Its Alloys	Aluminium (Al)	BSEN 15079:2015	0.05 % to 0.70 %
		Iron (Fe)		0.01 % to 1.2%
		Manganese (Mn)		0.001 % to 1.00 %
		Nickel (Ni)		0.008 % to 0.80 %
		Lead (Pb)		0.008 % to 12.5 %
		Antimony (Sb)		0.005 % to 0.70 %
		Silicon (Si)		0.01 % to 3.50 %
		Tin(Sn)		0.03 % to 8.50 %
		Zinc (Zn)	0.05 % to 40 .00%	

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Ferrous & Non Ferrous Materials	Tensile Test: Tensile Strength Yield Strength % Elongation	IS 1608: 2005(RA 2017)	100 N/mm ² to 1500 N/mm ² 100 N/mm ² to 1200 N/mm ² 1 % to 80 %
2.	Metals & Alloys	Rockwell Hardness	IS 1586 (Part 1): 2012	20 HRC to 70 HRC