Laboratory	hemical and Metallurgical Laboratories, #57, 1st Floor, 8th Main, etechannappa Industrial Estate, Kamakshipalya, Magadi Road, angalore, Karnataka ocation 1: # 57, 1st Floor, 8th Main, Petechannappa Industrial Estate, amakshipalya, Magadi Road, Bangalore, Karnataka ocation 2: # 36/1, 12th Main, 17th Ward, Puttaiah Road, Vrushbhavathi agar, Bangalore, Karnataka		
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SI.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		CHE	EMICAL TESTING	
I.	METALS AND ALLC	DYS		
1.	Ferrous Base			
a.	Plain Carbon/ Low alloy Steel & Free Cutting Steel	C Si Mn P S Cr Mo Ni Al Co Cu V Pb B	ASTM E 415- 15, IS 8811: 1998	0.041% to 1.1% 0.04% to 1.2% 0.05% to 1.8% 0.003% to 0.10% 0.001% to 0.35% 0.05% to 3.2% 0.01% to 0.87% 0.01% to 3.3% 0.01% to 1.05% 0.003% to 0.018% 0.01% to 0.45% 0.004% to 0.55% 0.001% to 0.35% 0.0005% to 0.001
b.	Stainless Steel	C Si Mn P S Cr Mo	ASTM E1086- 14 IS 9879: 1998	0.013 % to 0.16%   0.16 % to 1.2%   0.36 % to 1.85%   0.008 % to 0.022%   0.005 % to 0.39%   12 % to 27%   0.05 % to 3.75%

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		Ni		0.30 % to 25.00%
		Со		0.017 % to 0.20%
		Cu		0.026 % to 0.37%
		Nb		0.005% to 1.11%
		Ti		0.001% to 0.35%
C.	High Mn Steel	С	ASTM E 2209: 13	0.02 % to 1.20%
		Si		0.10 % to 0.50%
		Mn		4.00 % to 13.12%
		Р		0.012 % to 0.05%
		S		0.001 % to 0.02%
		Cr		0.15 % to 20.00%
		Ni		0.27 % to 7.08%
d.	Tool Steel/Die	С	CML/MSP/Fe 003	0.36 % to 2.22%
	steel	Si	Issue Date: April 2010	0.15 % to 2.00%
		Mn		0.20 % to 1.10%
		Р		0.01 % to 0.04%
		S		0.001 % to 0.04%
		Cr		3.50 % to 15.00%
		Мо		0.04 % to 5.50%
		Со		0.10 % to 10.00%
		V		0.40 % to 2.00%
		W		0.009 % to 21.00%
e.	Cast Iron	С	IS 15338-2013	1.85 % to 3.8%
		Si		0.72 % to 2.87%
		Mn		0.15 % to 1.26%
		Р		0.03 % to 0.31%
		S		0.01 % to 0.10%

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SI.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Cr		0.077 % to 0.90%
		Мо		0.009 % to 0.30%
		Ni		0.06 % to 1.80%
		Cu		0.10 % to 0.60%
		V		0.02 % to 0.35%
2.	Aluminium Base	Bi	ASTM E 1251:2011	0.005 % to 0.40%
		Cr		0.01 % to 0.36%
		Cu		0.01 % to 4.80%
		Fe		0.19 % to 1.64%
		Mg		0.11 % to 1.35%
		Mn		0.03 % to 1.00%
		Ni		0.05 % to 0.60%
		Pb		0.03 % to 0.60%
		Si		0.05 % to 18.00%
		Sn		0.02 % to 0.40%
		Ti		0.01 % to 0.30%
		Zn		0.03 % to 1.30%
		Zr		0.06 % to 0.20%
3.	Copper Base	AI	BS EN 15079: 2015	0.005 % to 11.00%
		Bi	CML/QAP/Cu 001	0.025 % to 0.14%
		Fe	Issue Date: April 2010	0.001 % to 4.25%
		Mn		0.01 % to 0.55%
		Ni		0.01 % to 4.75%
		Р		0.004 % to 0.25%
		Pb		0.01 % to 22.50%
		Si		0.01 % to 0.30%
		Sn		0.03 % to 11.0%
		Zn		0.005 % to 45.0%

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4.	Tin Base/ Solders	Ag	CML/QAP/Sn 002	0.02 % to 0.03%
		As	Issue Date: April 2010	0.01 % to 0.03%
		Cd		0.01 % to 0.02%
		Cu		0.07 % to 0.2%
		Fe		0.004 % to 0.025%
		Ni		0.005 % to 0.03%
		Sb		0.2 % to 3.0%
		Zn		0.001 % to 0.02%
5.	Positive Material	Fe	ASTM E 1476-04	Qualitative
	Identification	Cu	ASTM E 1916-11	(Material Sorting/
	(Iron,Copper,	Ni		Segregation)
	Nickel, Tin, Zinc,	Sn		
	Lead & Their	Zn		
	alloys)	Pb		

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SI.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		MECHANIC	CAL TESTING	
LOC	ATION-1		Τ	
Ι.	MECHANICAL PRO	PERTIES OF METALS		
1.	Metallic Materials	Brinell Hardness Test(HBW)	IS 1500 (Part1) 2013 ASTM E10-2017 ISO 6506-2005	60 HBW to 450HBW (2.5/187.5) 50 HBW to 250 HBW (5/250)
		Rockwell Hardness Test	IS 1586 (part 1) 2012 ASTM E18-2017 ISO 6508-1-2005	50 HRA to 75 HRA 40 HRBW to -90 HRBW 20 HRC to 70 HRC
		Vickers Hardness Test HV	IS 1501 (part 1) 2013 IS 12783:1989 ISO 6507-1:2005 ASTM E92-2017	100 HV to 850 HV1 100 HV to 850 HV5 100 HV to 850 HV10 100 HV to 850HV20 100 HV to 850 HV30
2.	Metallic Sheet & Strips	Erichson Cupping Test	IS 10175-2012	0.2 mm to 2 mm Thick
3.	Mettalic/ non metallic coatings on Iron Base, Copper base, Aluminium base	Coating thickness	IS 6012-1992 (RA2006) ASTM E376-2011 (eddy current method)	4 μ to 900 μ
4.	Steel Products	Leeb Hardness Test (Portable Hardness)	ASTM A956-2010	450 HLD to 890HLD (20 HRC to 62 HRC 85 HRB to 99 HRB

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				165 HV to 976 HV 160 BHN to 651 BHN)
II.	METALLOGRAPHY			
1.	Steel and Electroplated Anodized aluminium	Salt Spray fog test Neutral Salt Spray	ASTM B117-2016 IS 9844-1981 (RA 2016)	Qualitative
2.	Steel products	Effective Case depth	IS6416-1988 RA2018) ASTM B934-2015 (Vickers Hardness HV1)	0.05 to 5.0 mm
		Total case Depth	IS6416-1988 RA2018) ASTM B934-2015 (Microscopic method)	Qualitative (5 µ to 1000 µ)
		Measuring Decarburized depth	IS 6396-2000 (Microscopic method)	Qualitative (0 to 0.05 mm)
3.	Metallic Products	Estimation average Grain Size	IS4748-2009(RA2017) ASTM E112-2013 (Microscopic Method)	ASTM Grain size No 1 to10
4.	Ferrous & Non- ferrous materials	Cladding Thickness/ Weld, Brazing Joint Thickness	IS3203-1982(RA2016) IS 7562-1974 (Microscopic Method)	Qualitative (5μ to 100 μ)
		Micro structural	ASM Handbook Volume -7 & 9 -2004	Qualitative (Magnification 100x, 200x,500x,1000x,2000x)
		Macro Examination	IS 11371-1985(RA 2018) IS 12573-2010(RA 2012) ASTM E381-2017 ASM Handbook Vol. 9-2004	Qualitative (Magnification 10x to 50x)

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SI.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
5.	Steel products	Macroscopic	IS 13015-1991	Qualitative
		Examination	(RA-2018)	(Magnification 10x to 50x)
6.	Iron Castings	Microstructure of graphite Microscopic Method	ASTM A247-2017 ASM Handbook Vol .9-2004 IS 7754:1975(RA2018) (MicroscopicMethod)	Qualitative (Magnification 100x to 500x)
III.	PLASTICS AND PL	ASTIC PRODUCTS		
1.	Plastic products	Shore D Hardness	ASTM D2240-2015	10 to 100 6 mm Thick(mm)
IV.	RUBBER AND RUB	BER PRODUCTS		
1.	Rubber Products	Shore A Hardness	ASTM D2240-2015	10 to 100 6 mm Thick(mm)

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SI.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
LOC	ATION-2			
I.	MECHANICAL PRO	PERTIES OF METALS		
1.		Tensile Test: Ultimate Tensile Strength Yield Strength 0.2% proof stress % Elongation %Reduction in area	IS 1786-2008 (RA-2013) IS 1608-2005(RA2011) ASTM A370-2017 ASTM E8- 2015 ISO 6892-1998	50N to 360kN 0.5% to 80% 10% to 80%
		Compression Test	IS 13780-1988	50N to 360kN
		Bend Test	IS 1599-2012 ISO 7438-2005	Qualitative (Mandrel Size-16mm, 24mm,32mm,48mm and 60mm)
2.	Metallic Materials-Tube	Drift ExpansionTest or Flaring Test Flattening Test	IS 2335-2005 ASTM A370-2017 ISO 8493-1998 IS 2328-2005	Qualitative (Dia 10 mm to 50 mm Cone angle 30°,45°,60°) Qualitative
3.	Metallic Materials	Charpy Impact Test 'V' Notch	ISO 8492-1998 IS 1757(P-1):2014 ASTM E 23:2017 ISO: 148-1:2009	(Dia 50mm to 300mm) 5 to 240 Joules (-)80 °C to +200°C
		Charpy Impact Test 'U' Notch	IS 1499:1997 ASTM E 23:2017 ISO: 148-1:2009	
		Izod Impact Test	IS 1598 :1997 ASTM E 23:2017	5 J to 140 J At room Temperature

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4.	Fusion Welded Joints Materials	Transverse Root bend, Face bend on Butt Weld	IS 3600 (Part 5):1983 ISO 5173:1981	Qualitative (Mandrel Size 16mm,24mm, 32mm, 48mm & 60 mm)
		Transverse tensile Test	IS 3600 (Part 3):2009 ISO 4136:2001	5 N to 390 kN