

**Laboratory**

**Axis Inspection Solutions, Plot No. 175, Sriram Nagar,  
Gajularamaram, Dist. Rangareddy, Hyderabad, Telangana**

**Location 1: Plot No. 175, Sriram Nagar, Gajularamaram, Dist. Rangareddy,  
Hyderabad, Telangana**

**Location 2: B-76/A, A.P.I.E., Balanagar, Hyderabad, Telangana**

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

**Certificate Number TC-5352**

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**Validity 01.03.2019 to 28.02.2021**

**Last Amended on 23.05.2019**

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**

<b>LOCATION 2</b>				
<b>I.</b>	<b>CORROSION TESTS</b>			
<b>1.</b>	<b>Metals</b>	Salt spray (Fog) method	ASTM B 117; JIS 2371	Qualitative
<b>II.</b>	<b>METALS &amp; ALLOYS</b>			
<b>1.</b>	<b>Cast Iron</b>	Aluminium	IS 15338, ASTM E 1999	0.004 % to 0.03 %
		Arsenic		0.024 % to 0.44 %
		Carbon		1.5 % to 4.5 %
		Chromium		0.02 % to 1.00 %
		Cobalt		0.01 % to 0.05 %
		Copper		0.01 % to 0.75 %
		Magnesium		0.01 % to 0.02 %
		Manganese		0.1 % to 2.00 %
		Molybdenum		0.005 % to 0.061 %
		Nickel		0.1 % to 0.45 %
		Phosphorous		0.01 % to 0.33 %
		Silicon		0.47 % to 2.63 %
		Sulphur		0.006 % to 0.081 %
		Tin		0.005 % to 0.19 %
		Titanium		0.001 % to 0.02 %
		Vanadium		0.02 % to 0.50 %
<b>2.</b>	<b>Aluminum</b>	Bismuth	ASTM E 1251	0.008 % to 0.56 %
		Chromium		0.001 % to 0.50 %
		Cobalt	ASTM E 1251	0.008 % to 0.56 %

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		Copper		0.01 % to 10.0 %
		Iron		0.2 % to 1.3 %
		Lead		0.001 % to 1.0 %
		Magnesium		0.05 % to 5.00 %
		Manganese		0.015 % to 3.0 %
		Nickel		0.03 % to 2.5 %
		Silicon		0.001 % to 20.00 %
		Tin		0.005 % to 0.24 %
		Titanium		0.025 % to 0.20 %
		Vanadium		0.007 % to 0.44 %
		Zinc		0.002 % to 8.00 %
		Zirconium		0.01 % to 0.275 %
<b>3.</b>	<b>Low and Medium Carbon Steel</b>	Aluminum	IS 8811, ASTM E-415	0.005 % to 1.50 %
		Arsenic		0.003 % to 0.05 %
		Boron		0.0001 % to 0.1 %
		Carbon		0.044 % to 1.31 %
		Chromium		0.007 % to 5.00 %
		Cobalt		0.006 % to 0.40 %
		Copper		0.004 % to 1.00 %
		Lead		0.003 % to 0.34 %
		Manganese		0.02 % to 1.7 %
		Molybdenum		0.002 % to 1.50 %
		Nickel		0.005 % to 5.00 %
		Niobium		0.003 % to 0.12 %
		Phosphorus		0.005 % to 0.1 %
		Silicon		0.005 % to 2.00 %
		Sulphur		0.001 % to 0.35 %
		Tin		0.003 % to 1.00 %
		Titanium	IS 8811, ASTM E-415	0.002 % to 0.25 %
		Tungsten		0.01 % to 0.25 %

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4.	Copper	Vanadium	BS EN 15079	0.003 % to 1.00 %
		Aluminium		0.007 % to 8.8 %
		Arsenic		0.02 % to 0.25 %
		Chromium		0.001 % to 0.05 %
		Iron		0.01 % to 5.0 %
		Lead		0.08 % to 11.7 %
		Manganese		0.004 % to 5.2 %
		Nickel		0.010 % to 32.0 %
		Phosphorus		0.001 % to 0.7 %
		Silicon		0.006 % to 0.9 %
		Sulphur		0.001 % to 0.16 %
		Tin		0.05 % to 13.0 %
5.	Nickel	Zinc	AXIS/SOP/03	0.006 % to 40.0 %
		Aluminium		0.04 % to 1.65 %
		Boron		0.002 % to 0.04 %
		Carbon		0.01 % to 0.20 %
		Chromium		0.03 % to 21.00 %
		Cobalt		0.02 % to 20.0 %
		Copper		0.03 % to 31.0 %
		Iron		0.1 % to 40.00 %
		Manganese		0.02 % to 1.260 %
		Molybdenum		0.1 % to 6.00 %
		Niobium		0.02 % to 5.00 %
		Phosphorus		0.006 % to 0.11 %
6.	Stainless steel	Silicon	AXIS/SOP/03 IS 9879; ASTM E 1086	0.02 % to 1.2 %
		Sulphur		0.001 % to 0.03 %
		Titanium		0.001 % to 3.00 %
		Tungsten		0.02 % to 4.42 %
		Aluminum		0.005 % to 1.3 %
		Boron		0.0001 % to 0.05 %

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		Carbon		0.004 % to 0.33 %
		Chromium		11.40 % to 28.0 %
		Cobalt		0.05 % to 1.5 %
		Copper		0.004 % to 4.0 %
		Lead		0.003 % to 0.15 %
		Manganese		0.026 % to 10.0 %
		Molybdenum		0.002 % to 10 %
		Nickel		0.007 % to 40.0 %
		Niobium		0.001 % to 1.1 %
		Phosphorous		0.001 % to 0.15 %
		Silicon		0.005 % to 3.5 %
		Sulphur		0.001 % to 0.34 %
		Titanium		0.002 % to 0.8 %
		Tungsten		0.01 % to 10.0 %
		Vanadium		0.003 % to 4.0 %
<b>7.</b>	<b>Tool Steel</b>	Carbon	AXIS/SOP/02	0.65 % to 1.55 %
		Chromium		2.9 % to 4.55 %
		Cobalt		0.08 % to 8.0 %
		Manganese		0.2 % to 0.4 %
		Molybdenum		0.18 % to 9.41 %
		Phosphorus		0.02 % to 0.043 %
		Silicon		0.15 % to 0.3 %
		Sulphur		0.02 % to 0.035 %
		Tungsten		1.8 % to 17.80 %
		Vanadium		0.22 % to 1.8 %s

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**MECHANICAL TESTING**

<b>LOCATION 2</b>				
<b>I.</b>	<b>MECHANICAL PROPERTIES OF METALS</b>			
<b>1.</b>	<b>Steel Reinforcement</b>	Tensile strength Yield stress	IS 1786	10 kN to 600 kN
<b>2.</b>	<b>Ferrous and Non-Ferrous Material</b>	% Elongation	IS 1608 (P-1); ASTM E 8, ASTM A370; ASTM B 557, EN10002	2 % to 85 %
		% Reduction in area	IS 1608 (P-1); ASTM E 8, ASTM A370; ASTM B 557, EN10002	2 % to 85 %
		0.1 to 0.5% Proof stress	IS 1608 (P-1); ASTM E 8, ASTM Section IX; ASTM A370, ASTM B 55; EN10002	10 kN to 600 kN
		Tensile strength	IS 1608 (P-1); ASTM E 8, ASTM Section IX; ASTM A370, ASTM B 557; EN10002	10 kN to 540 kN
		Yield Stress	IS 1608 (P-1); ASTM E 8, ASTM A370; ASTM B 55, EN10002	10 kN to 540 kN
		Bend Test	IS 1599; ASME Sec IX, ASTM E 290; IS 7307(P-1)	Qualitative 10 kN to 600 kN and 10 kN to 100 kN Thickness: 0.5 mm to 25 mm

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Rockwell Hardness	IS 1586 (P-1) ASTM E18	60 HRA to 90 HRA
		Re-Bend	IS 1608 (P-1), ASTM E 8, ASTM Section IX, ASTM A370, ASTM B 557, EN10002	10 kN to 100 kN
		Brinell Hardness Number (5mm / 250Kg)	IS 1500 (P-1); ASTM E10	50 HBW to 300 HBW
		Brinell Hardness Number (5mm / 750Kg)	IS 1500 (P-1) ASTM E10	90 HBW to 350 HBW
		Brinell hardness number (10mm / 1000Kg)	IS 1500 (P-1) ASTM E10	90 HBW to 255 HBW
		Brinell hardness number (10mm / 3000Kg)	IS 1500 (P-1) ASTM E10	150 HBW to 575 HBW
		Brinell Hardness Number (2.5MM/187.5Kg)	IS 1500 (P-1) ASTM E10	150 HBW to 450 HBW
		Yield strength	IS 1608 (P-1); ASTM E 8; ASTM Section IX; ASTM A370, ASTM B 557; EN10002	10 kN to 100 kN
		Rockwell hardness	IS 1586 (P-1); ASTM E18	50 HRB to 100 HRB
		Rockwell Hardness	IS 1586 (P-1); ASTM E18	20 HRC to 60 HRC
3.	<b>Composites and Rigid Cellular Plastics</b>	Tensile Strength	ASTM D 3039/ 3039 M; ASTM D 1623	10 kN to 600 kN
		Apparent Density	ASTM D 1622/D 1622 M-14	Qualitative
		Compression Test	ASTM D 1621-16	10 kN to 600 kN
4.	<b>Metallic Materials</b>	Charpy V-notch, Ambient temp to -60 Degree centigrade	IS 1757(P-1)	Qualitative 2J to 300J
		Impact Izod test Ambient temperature	IS 1598	Qualitative 2 J to 170 J

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		Micro Vickers Hardness	IS 1501 (Part 1) ASTM E 384	80 HV to 1000 HV Load: 10 g to 1000 g
		Vickers Hardness	IS 1501 ASTM E 92	80 HV to 800 HV (1, 5, 10, 15, 15.625, 20, 30, 31.25, 40, 50, 60, 62.5, 100, 120)
<b>5.</b>	<b>Metals and Alloys</b>	Flattening test tube for tubes	IS 2328	Qualitative Upto 250 mm
		Proof Load	IS 1367 (P-6)	Size M3 to M30
		Nuts	IS 1367 (P-3)	Size M 3 to M30
		Bolts and Studs	IS 1367 (P-14)	Size M 3 to M30
<b>II.</b>	<b>METALLOGRAPHY TEST</b>			
<b>1.</b>	<b>Metals and alloys</b>	Total case depth by microscopy	IS 6416	0.1 mm to 10 mm
		Effective Depth by micro-hardness	IS 6416	0.1 mm to 10 mm
		Decarburization depth	IS 6416; ASTM E 1077	0.1 mm to 1 mm
<b>2.</b>	<b>Plated / Coated Materials</b>	Coating thickness by microscopic method	IS 3203	Upto 200 µm
<b>3.</b>	<b>Stainless Steel</b>	Inter Granular Corrosion (Practice B,C,)	ASTM A 262	0.05 to 0.40 mills / month
		Inter Granular Corrosion (Practice E,F,)	ASTM A 262	Qualitative
<b>4.</b>	<b>Metals &amp; Alloys, Cast Iron and Weldments</b>	Macrostructure and grain Flow Studies	IS 11371; IS 13015	Qualitative (Magn. 1 X to 40 X)
		Macro Etch Test	ASTM E 340; ASTM E 381	Qualitative
		Microstructure	IS 7739 (P-1); IS 7754 (P-1); ASTM E3; ASTM E	Qualitative (Magn. 50X, 100X,

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			407-07; ASM Handbook, Vol 9	200X, 500X, 1000X)
		Grain Size	IS 4748; ASTM E 112	Grain Size No. 1 to 10
		Inclusion Rating of Steel	IS 4163; ASTM E 45	0.0 to 3.0



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**NON - DESTRUCTIVE TESTING**

<b>LOCATION 2</b>				
<b>I.</b>	<b>METALS &amp; ALLOYS</b>			
<b>1.</b>	<b>Castings, Forgings, Welded Plate</b>	Magnetic Particle Test	ASME SEC-V, Article 7 & 25, ASMT E 709 (Yoke Method-Visible & Fluorescent)	Qualitative Up to 3mm Depth
			ASME SEC- V, Article 7 & 25, ASTM E -709 (Prod Method-Visible & fluorescent)	
	<b>Welds</b>		ASME SEC-V, Article 7 & 25, ASTM E 709 (Prod Method-Visible & fluorescent)	
<b>2.</b>	<b>Casting (Ferrous)</b>	Penetrant Test	ASME SEC-V, Article 6 & 24, ASTM E 165/ E 165M-12: 2017 (Visible & fluorescent)	Qualitative Open to surface indications
	<b>Forging (Ferrous)</b>		ASME SEC-V, Article 6 & 24, ASTM E 165/E165 M-12 (Visible & fluorescent)	
	<b>Plates (Ferrous)</b>		ASME SEC-V, Article 6 & 24, ASTM E 165/E 165 M-12 (Visible & fluorescent)	
	<b>Plates (Non-Ferrous)</b>		ASME SEC-V, Article 6 & 24, ASTM E 166/ E 165M-	

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	<b>Welds (Non-Ferrous)</b>		12 (Visible & fluorescent) ASME SEC- V, Article 6 & 24, ASTM E 165/E 165M-12 (Visible & fluorescent)	
	<b>Welds (Ferrous)</b>		ASME SEC-V, Article 6 & 24, ASTM E 165/E165M-12 (Visible & fluorescent)	
<b>3.</b>	<b>Casting; Welds; Castings; Welding's</b>	<b>Radiography Test</b>	ASME SEC-V, Article 2 & 22 X-Ray	Qualitative 2mm to 40mm of steel equivalent, 2% of sensitivity
<b>4.</b>	<b>Casting (Ferrous &amp; Non-Ferrous)</b>	<b>Ultrasonic Test</b>	ASME SEC-V, Article 4,5 & 23, ASTM A 609/A609 M-12 Contact Method	Qualitative :5mm to 300 mm
	<b>Forging (Ferrous &amp; Non-Ferrous)</b>		ASME SEC-V, Article 4,5 & 23, ASTM A-388/ SA 388-11 Contact Method	Qualitative :5mm to 800mm
	<b>Plate (Ferrous &amp; Non-Ferrous)</b>		ASME SEC-V, Article 4,5 & 23,ASTM A-435/A 435M-09, ASTM A 578/ A 578M-07 Contact Method	Qualitative :5 mm to 150 mm
	<b>Weld Joints (Ferrous &amp; Non-Ferrous)</b>		ASME SEC-V, Article 4,5 & 23 Contact Method	Qualitative Welds: 3 mm to 100 mm