

Laboratory **ISGEC Hitachi Zosen Ltd., Plot No. 13-B, G.I.D.C. Industrial Estate, Dahej, Bharuch, Gujarat**

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

Certificate Number **TC-6146**

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Validity **19.05.2018 to 18.05.2020**

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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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Ferrous, Non-Ferrous Metals & Alloys	Ultimate Tensile Strength Yield Strength 0.2 % Proof Stress % Elongation % Reduction in Area	ASTM A370 ASTM E8/ E8M IS 1608	250 MPa to 1100 MPa 150 MPa to 1000 MPa 150 MPa to 1000 MPa 10 % to 70 % 10 % to 80 %
2.	Metals & Alloys (Plate & Sheet)	Bend Test guided by Roller	ASTM A370 ASTM E290	Qualitative (Mandrel Size: 12, 20, 40, 45, 60, 90 mm)
3.	Metals & Alloys (Sheet, Plates)	Brinell Hardness	ASTM A370 ASTM E10	100 HBW to 450 HBW (2.5/187.5)
		Vickers Hardness	ASTM A370 ASTM E92	100 HV ₁₀ to 450 HV ₁₀
4.	Ferrous Metals & Alloys	Charpy 'V' Notch Impact	ASTM E23 ASTM A370	10 J to 240 J (50°C to - 110 °C and - 196 °C)
5.	Ferrous Metals & Alloys (Tubes & Pipes)	Flattening Test	ASTM A370	Qualitative (Outside Diameter: 20 mm to 168 mm Thickness: 2 mm to 38 mm)
		Flaring Test	ASTM A370	Qualitative (Outside Diameter: 20 mm to 168 mm Thickness: 2 mm to 16 mm Cone Angle: 60°)

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6.	Weld & Welded Test Specimens- Ferrous, Non-Ferrous	Ultimate Tensile Strength Yield Strength 0.2% Proof Stress % Elongation %Reduction in Area	IS 3600 (Part 3) ASME Section IX (QW 150)	250 MPa to 1100 MPa 150 MPa to 1000 MPa 150 MPa to 1000 MPa 10 % to 70 % 10 % to 80 %
7.	Weld & Welded Test Specimens- Metals & Alloys	Bend Test guided by Roller	ASTM E190 ASME Section IX (QW 160) IS 3600 (Part 5) IS 3600 (Part 6)	Qualitative (Mandrel Size: 12, 20, 40, 45, 60, 90 mm)
8.	Weld & Welded Test Specimens- Metals & Alloys	Brinell Hardness	ASTM E10	100 HBW to 450 HBW (2.5/187.5)
		Vickers Hardness	ASTM E92	100 HV ₁₀ to 450 HV ₁₀
9.	Weld & Welded Test Specimens- Ferrous Metals & Alloys	Charpy 'V' Notch Impact	ASTM E23	10 J to 240 J (50°C to - 110 °C and- 196 °C)
II.	METALLOGRAPHY TEST			
1.	Metal and Alloys Fe and Ni base Alloys	Microstructure Examination	ASM Metal Hand Book - Microstructure & Atlas – Volume 9	Qualitative (Magnification: 50X, 100X, 200X, 400X, 500X & 1000X)
2.	Ferrous & Alloys Carbon Steel, Low Alloy Steel, High Alloy Steel, Stainless Steel	Average Grain Size by Comparison Method	ASTM E112	ASTM No : 1 to 10 (Magnification: 100X)
3.	Ferrous Alloys Duplex Stainless Steel	Detecting Detrimental Intermetallic Phase	ASTM A923 (Method A)	Qualitative (Magnification: 400X & 500X)

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4.	Carbon Steel, Low Alloy Steel, High Alloy Steel, Stainless Steel	Macrostructure Examination	ASTM E340 ASME Section IX	Qualitative
5.	Ferrous Metals Austenitic Stainless Steel	IGC Practice B	ASTM A262	1 mills/year to 2500 mills/year
		IGC Practice C	ASTM A262	1 mills/year to 2500 mills/year
		IGC Practice E	ASTM A262	Qualitative (As per bend test requirement)
6.	Nickel Base Alloys	IGC Practice Method A	ASTM G28	1 mills/year to 2500 mills/year