



National Accreditation Board for Testing and Calibration Laboratories

(A Constituent Board of Quality Council of India)



SCOPE OF ACCREDITATION

Laboratory Metallurgical Services Private Limited, Mehta House, Ashok Silk Mills Lane, Off. L.B.S. Marg, Ghatkopar (W), Mumbai, Maharashtra

Location 1: Mehta House, Ashok Silk Mills Lane, Off. L.B.S. Marg, Ghatkopar (W), Mumbai, Maharashtra

Location 2: 17, A-1, Shiv Shakti Industrial Estate, Off. L.B.S. Marg, Ghatkopar (W), Mumbai, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005


Certificate Number TC-7586 (in lieu of T-0135, T-0136 & T-4085) Page 41 of 49

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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
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MECHANICAL TESTING

I. METALLOGRAPHY TEST				
1.	Metals, Alloys	Tensile Test (ys, uts, %e, % ra, 0.2 % ps & 1 % ps)	IS 1608:2005 (RA 2017) ASTM A 370:2017 ASTM E-8/E8M-2016a IBR (2017) BS EN ISO:6892-2016 BS EN ISO 4136:2012 ASTM B 557:2015	UTS:50 to 2500 MPa 0.2 %PS:50 to 1500 MPa Y.S:50 to 1500 MPa 1 %PS:100 to 1500 MPa %EI:0.5 to 80 % %RA:2 to 90 %
		Tensile Test (n,k & r value)	ASTM E 517-2018 ASTM E 646-2016	6 to 300 kN
		Elevated Temperature Tensile Test (uts, % e, % ra, 0.2 % ps)	ASTM E-21:2017 BS EN ISO:6892-2:2011	40°C to 950°C UTS:50 to 1200 MPa 0.2 % PS:50 to 800 MPa 1 %PS:100 to 1000 MPa %E:0.2 to 100 % %RA:2 to 90 %
		Hardness Test (Brinell)	IS 1500 PT. 1:2013 (1996) ASTM A 370:2017A ASTM E 10:2017 BS EN ISO 6506-1:2014	100 to 350 HBW 2.5/187.5 100 to 500 HBW 10/3000
		hardness test (Vickers)	ASTM E92:2017 IS 1501 PT. 1:2013 ASTM A 370:2017 BS EN ISO 6507-1:2018 BS EN ISO 9015-1:2011	50 to 600 HV5 100 to 600 HV10 200 to 700 HV30


Venugopal C
Convenor


N. Venkateswaran
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		Hardness Test (Microvickers)	ASTM E 384:2017 IS 1501 PT. 1:2013 ASTM A 370-:2017 BS EN ISO 6507-1:2018 BS EN ISO 9015-1:2011	50-300 HV0.01 100 to 1100 HV0.1 ** 100 to 500 HV0.3 ** 100 to 500 HV0.5 200 to 1000 HV1
		Hardness Test (Rockwell) (Superficial)	IS 1586 PT. 1:2012 ASTM A 370-:2017 ASTM E 18-2017 e1 BS EN ISO 6508-1:2016	20 to 70 HRC 50 to 100 HRBW 40 to 75 15TW 70 to 90 30TW
2.	Grey Iron Casting	Transverse Tensile Test	IS 210:2009 (RA 2014)	4 to 400 kN
3.	Metals & Alloys (Plate, Rod, & Sheet)	Bend Test	IS 1599:2012 (RA 2015) ASTM A 370: :2017 ASTM E 290:2014 IBR:(2011 07) BS EN ISO 5173:2010 + A(2011)	MANDREL DIA 2-125 mm
4.	Metals & Alloys (Sheet & Strip)	Modified erichson Cupping test	IS 10175 (Part 1):1993 (RA 2012)	0.2 to 2.0 mm THICK & WIDTH 90 mm OR MORE
5.	Steel Plates	Through Thickness Tension Test (%RA)	ASTM A 770 M-03 (RA 2012) BS EN 10164:2004	PLATE THICKNESS FROM 15 to 350 mm %RA 2 to 90 %
6.	High Strength Deformed Steel Bars	Tensile Test (0.2 %PS, UTS, %E)	IS 1786:2008 (RA 2013) IS 1608:2005 (RA 2011)	0.2 %PS:250-800 MPa UTS:300-1000 MPa %E:2-30 %
		Bend Test	IS 1786:2008 (RA 2013) IS 1599:2012 (RA 2015)	MANDREL DIA 6 to 220 mm

Venugopal C
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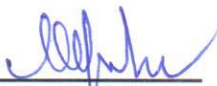
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		Rebend Test	IS 1786:2008 (RA 2013)	Mandrel Dia 16 to 224mm
		Mass/Unit Length	IS 1786:2008 (RA 2013)	0 to 30 Kg
		Fracture Toughness (K1C, J1C, CTOD)	ASTM E 399-2017 ASTM E 1820-2017 BS 7448 Pt.1:1991 Pt 3:2005 ISO 12135:2016	0.25 to 100 kN
		Fatigue Test	ASTM E 466-2015 ASTM E 606-2012 ASTM E 647-2015 e1	0.25 to 100 kN Freq:0.5 Hz-100 Hz
		Creep/Stress Rupture Test	ASTM E 139:2011 ASTM E 292:2009 e1	0.04 to 53.3 kN Temp:Ambient-1000°C
7.	Covered Electrodes in Welding Mild & Low Alloy Steel	Diffusible Hydrogen Test (HG)	IS 11802:1986 (RA 2013)	15 ml/100 gms of WELD METAL
			ISO 3690-2012	10 ml/100 g of WELD METAL
8.	Manual Metal Arc Welding Electrodes	Metal Recovery	IS 13043:1991 (RA 2008)	1.2 to 6.3 mm Size
9.	Welded Metals and Alloys	Tensile Test (YS, UTS,) AWS D	ASME SEC IX 2017 BS EN ISO 15614:2017 API-1104:2013 AWS D1.1:2015 AWS D1.2:2014 AWS D1.6 2017	Y.S:50 to 1500 MPa UTS:50 to 2500 MPa


Venugopal C
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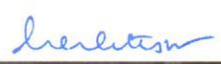
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10.	Metals & Alloys (Welded Test Piece)	Nick Break Test	API:1104-21 st ED IBR (RA 2017) IS 2825:1969 (RA 2017)	VISUAL OBSERVATION MAG 1X.
11.	Metals & alloys, Covered electrodes for mmaw of carbon & C-mn steel Welding rods electrodes & filler metals	Bend Test (Butt Weld)	IS 814:2005 (RA 2011) ASME SEC IX (2017) API 5L 46 th ED	180 ° BENT OVER MANDREL DIA 2-200 mm
12.	Metals & Alloys (Wires, Welded Pipes And Tubes)	Reverse Bend Test	ASTM A 370:2017 IS 1716:1985 (RA 2011)	3/8"-4" O.D AND WALL THICKNESS 0.1 to 3.4 mm
13.	Metals & Alloys	Salt Spray Test	ASTM B 117-2016 ISO 9227 Method A:2017	Qualitative Temp:25 to 40°C Time:1 h to 1000h
14.	Metals & alloys, Covered electrodes for mmaw of carbon & C-mn steel Welding rods electrodes & filler metals	Tensile Test (YS, UTS, % E, %RA,0.2 %PS)	IS 814:2004 (RA 2010) IS 1608:2005 (RA 2011) ASME SEC II PT. C (2017)	Y.S:50-600MPa UTS:50-1200 MPa 0.2 %PS:50-800 MPa %E:0.2-100 % %RA:2-90 %
		Charpy Impact Test	IS 1757 Part 1 2014 ASTM A 370:2017 ASTM E 23:2016b ISO 148-1:2016-10 IBR (RA 2017) ASME SEC VIII Div .1	2 to 406J TEMP. RANGE: +50°C to -196 °C


Venugopal C
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			2017	
		Izod Impact Test	IS 1598:1977(RA 2015) IBR (RA 2017)	2 to 160 J
15.	Metals & Alloys (Tubes/Pipes)	Flattening Test	IS 2328:2005 (RA 2011) ASTM A 370:2017 ASTM B 111/B111M-2016 IBR (RA 2017), API-5L-2015 ASTM A 999/999M:17 ASTM A 1016/1016M:2017a	3.2 to 700 mm O.D. FERROUS TUBES 3.2 to 300 mm O.D. NON FERROUS TUBES
16.	Metals & Alloys (Welded Tubes And Pipes)	Reverse Flattening Test	ASTM A 370:2017	1/2" to 6" O.D & 0.1 to 15 mm
17.	Metals & Alloys (Tubes/Pipes)	Flanging Test	IS 2330:2011 ASTM A 370:2017, IBR:(RA 2017)	10 to 80 mm O.D. & 0.1 to 10 mm THICKNESS
18.	Metals & Alloys (Tubes/Pipes)	Flaring/Drift Expansion Test	IS 2335:2005 (RA 2011) ASTM A 370:2017 ASTM B 153:2017 IBR (RA 2017) API 5L 46 th ED	2 to 150 mm O.D. & 0.1 to 15 mm THICKNESS
19.	Metals & Alloys (Boiler/Pressure Tubes)	Crushing Strength	IS 3601:2006 (RA 2012) ASTM A 370-2017	10 to 400 kN
20.	Metals & Alloys (Tubes To Tube Sheets Mock-Up)	Pull Out Test	ASME SEC VIII DIV 1 (2017)	10 to 1000 kN

Venugopal C
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21.	Metals & Alloys Fasteners (NUTS)	Proof Load	IS 1367 (Part 6:1994 (RA 2015) ASTM A 370-2017	10 to 1000 kN M3 to M39
22.	Metals & Alloys	Hydrogen Induced Cracking	NACE TM 0284:2016	QUALITATIVE Crack:10 microns & above H2S Conc:2000 to 4000 ppm
		Sulfide Stress Cracking	NACE TM 0177:2016 (METHOD A & B) NACE 7M 0316:2016	1.5 to 16 kN FPB:5mm max thickness
23.	Metals, Alloys & Welds	Macro Etch Test	IS 11371:1985 (RA 2007) ASTM E 340:2015 ASTM E 381:2017 BS EN 17639:2013 ASME SEC IX (2017) IS 13015:1991 (RA 2012)	QUALITATIVE MAG 10X, 20X
		Case Depth	IS 6416:1988 (RA 2012) By MICROSCOPIC METHOD	10 to 2000 Microns
			IS 6416:1988 (RA 2012) BY HARDNESS TRAVERSE METHOD	400 to 1000 HV 0.1
		Microstructure of Cast Iron	ASTM A 247:2017 IS 7754:1975 (RA 2012)	QUALITATIVE MAG. 100X
24.	Metals, Alloys & Welds	Microstructure	ASTM E 3:2017 ASTM E407-07 (RA 2015) e1 ASM METAL HAND BOOK VOL. IX	0.5 to 10 GRAIN SIZE/100X

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			IS 7739 (Part 1):1975 (RA 2010) BS EN 17639:2013	
		Average Grain Size Measurement	ASTM E112:2013 IS 4748:2009 BY MICROSCOPIC METHOD	100X MAG. ASTM NO.-1 to 10
25.	Ferritic, Austenitic, Duplex (F/A) Stainless Steels	IGC TEST	ISO 3651-2:1998 (METHOD A, B & C)	FORMER DIA 2XT ANGLE 90° MAG 10 X
		IGC Test (HUEY TEST)	ISO 3651-1:1998	1 to 2500 MPY
26.	Austenitic Stainless Steels	IGC Practice-A	ASTM A262:2015	250X 500X
		IGC Practice-B	ASTM A 262:2015	1 to 2500 MPY
		IGC Practice-C	ASTM A 262:2015 IS 10461 PT. 1:94 (RA 2016) IS 10461 PT. 2 94: (RA 2007)	1 to 2500 MPY
		IGC Practice-E	ASTM A 262:2015 IS 10461 PT 2:94 (RA 2007)	FORMER Dia 1XT, 4XT ANGLE 180° MAG 5X TO 20 X
27.	Stainless steels and nickel base, chromium bearing alloys.	Pitting Corrosion	ASTM G-48-2011 RA 2015 (METHOD-A)	QUALITATIVE MAG. 20X
		Crevice Corrosion	ASTM G-48-2011- (RA 2015) (METHOD-B)	QUALITATIVE MAG. 20X

Venugopal C
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28.	Wrought, Cast, Welded Nickel Rich Chromium Bearing Alloys	Ferric sulphate-Sulphuric acid test	ASTM G-28-2002 (RA 2015) METHOD-A	1 to 2500 MPY
		Mixed Acid-Oxidizing Salt Test	ASTM G-28-2002 (RA 2015) METHOD-B	1 to 3000 MPY
29.	Austenitic/Ferritic (Duplex Stainless Steel)	Chloride Stress Corrosion Test	ASTM G-36-94 (RA 2013)	10X MAGNIFICATION
		Sodium Hydroxide Etch Test	ASTM A 923-2014 (METHOD-A)	400 X
		Ferric Chloride Corrosion Test	ASTM A 923-2014 (METHOD-C)	1 to 2500 MDD
30.	Metals & Alloys	Inclusion Rating In Steel	ASTM E 45:2018 IS 4163:2004 (RA 2010)	0.5 to 3
		Ferrite Measurement	ASTM E-1245-2016 ASTM E 562-2011	3 to 70 %
		Ferrite Measurement	ASTM A 800/800M-2014 BY FERRIT SCOPE	0.10 to 83.60 %
		Coating Thickness Measurement	IS 3203:1982 (RA 2016) BY MICROSCOPIC METHOD	10 microns to 2 mm
		Decarb Measurement	IS 6396-2000 (RA 2012) ASTM E-1077-2014 BY MICROSCOPIC METHOD	10 microns to 2 mm

Venugopal C
Convenor

N. Venkateswaran
Program Manager