



CERTIFICATE OF ACCREDITATION

FMI CALIBRATION LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

B-7/12, MIDC AREA, MIRAJ, SANGLI, MAHARASHTRA, INDIA

in the field of

CALIBRATION

Certificate Number: CC-2374

Issue Date: 26/03/2021 Valid Until: 25/03/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity: FMI CALIBRATION LABORATORY

Signed for and on behalf of NABL



N. Venkateswaran Chief Executive Officer





SCOPE OF ACCREDITATION

Laboratory Name:

FMI CALIBRATION LABORATORY, B-7/12, MIDC AREA, MIRAJ, SANGLI,

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Validity

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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
		3.0	Permanent Facility		
1	MECHANICAL- DIMENSION (PRECISION INSTRUMENTS)	Extensometer	Using Extensometer calibration fixture, Electronic probe and DRO, as per IS 12872 & ASTM E83 by comparison method	Up to 5 mm	3.0 µm for IS method 300 µm for ASTM method
2	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HR15N Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	70 HR15N to 95 HR15N	0.45HR15N
3	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HR15TW Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	67 HR15TW to 93 HR15TW	0.67HR15TW
4	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HR30N Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	40 HR30N to 87 HR30N	0.5HR30N
5	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HR30TW Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	29 HT30TW to 82 HR30TW	0.7HT30TW





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6	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HR45N Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	20 HR45N to 77 HR45N	0.5HR45N
7	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HR45TW Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	10 HR45TW to 72 HR45TW	0.8HR45TW
8	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HRA Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	20 HRA to 95 HRA	0.4HRA
9	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HRBW Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	10 HRBW to 80 HRBW	1.04HRBW
10	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HRBW Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	80 HRBW to 100 HRBW	0.61HRBW
11	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HRC Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	10 HRC to 35 HRC	0.4HRC





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12	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HRC Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	35 HRC to 55 HRC	0.35HRC
13	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Rockwell Reference Hardness Blocks (Test Blocks): HRC Scale	Using Rockwell Standardising Machine as per IS 1586 (Part 3), ISO 6508-3 & ASTM E18	55 HRC to 70 HRC	0.34HRC
14	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Vickers Reference Hardness Blocks (Test Blocks): HV 10 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3, ASTM E92	Up to 1500 HV 10	1.2%
15	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Vickers Reference Hardness Blocks (Test Blocks): HV 20 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3 & ASTM E92	Up to 1500 HV 20	1.2%
16	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Vickers Reference Hardness Blocks (Test Blocks): HV 30 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3 & ASTM E92	Up to 1500 HV 30	1.2%
17	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Vickers Reference Hardness Blocks (Test Blocks): HV 5 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3 & ASTM E92	Up to 1500 HV 5	1.2%





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18	MECHANICAL- HARDNESS TESTING MACHINES	Calibration of Vickers Reference Hardness Blocks (Test Blocks): HV 50 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3 & ASTM E92	Up to 1500 HV 50	1.2%
19	MECHANICAL- HARDNESS TESTING MACHINES	Calibration Vickers Reference Hardness Blocks (Test Block): HV 0.5 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3, ASTM E92 & ASTM E384	Up to 1000 HV 0.5	3.3%
20	MECHANICAL- HARDNESS TESTING MACHINES	Calibration Vickers Reference Hardness Blocks (Test Blocks): HV 0.05 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3, ASTM E92 & ASTM E384	Up to 232 HV 0.05	7.0%
21	MECHANICAL- HARDNESS TESTING MACHINES	Calibration Vickers Reference Hardness Blocks (Test Blocks): HV 0.1 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3, ASTM E92 & ASTM E384	Up to 464 HV0.1	7.0%
22	MECHANICAL- HARDNESS TESTING MACHINES	Calibration Vickers Reference Hardness Blocks (Test Blocks): HV 0.2 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3, ASTM E92 & ASTM E384	Up to 900 HV 0.2	7.0%





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23	MECHANICAL- HARDNESS TESTING MACHINES	Calibration Vickers Reference Hardness Blocks (Test Blocks): HV 0.3 scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3, ASTM E92 & ASTM E384	Up to 1000 HV 0.3	3.5%
24	MECHANICAL- HARDNESS TESTING MACHINES	Calibration Vickers Reference Hardness Blocks (Test Blocks): HV 1 Scale	Using Vickers Standardizing Machine as per IS 1501 (Part 3), ISO 6507-3, ASTM E92 & ASTM E384	Up to 1000 HV 1	3.2%
25	MECHANICAL- HARDNESS TESTING MACHINES	Force Verification of Rockwell hardness Tester(Direct Verification)	Using load cell as per IS 1586 (Part2), IS 1586 (Part 3), ISO 6508-2, ISO 6508-3 & ASTM E18	29.42 N to 1471 N	1.4%
26	MECHANICAL- HARDNESS TESTING MACHINES	Force Verification of Rockwell hardness Tester(Direct Verification)	Using load cell as per IS 1586 (Part2), IS 1586 (Part 3), ISO 6508-2, ISO 6508-3 & ASTM E18	29.42N 98.07 N 147.1 to 1	0.3% for 29.42 N 0.13% for 98.07 N 0.1% for 147.1 to 1471 N%
27	MECHANICAL- HARDNESS TESTING MACHINES	Force Verification of Vickers hardness Tester(Direct Verification)	Using Load cell as per IS 1501 (Part 2), IS 1501 (Part 3), ISO 6507-2, ISO 6507-3, ASTM E92 & ASTM E384	0.4903 N 0.9807 N to 490.	0.2% for 0.4903N 0.1% for 98.07 to 490.35 N%





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28	MECHANICAL- HARDNESS TESTING MACHINES	Verification of diagonal measuring system for Vickers hardness Tester (Direct Verification)	Using glass scale as per IS 1501 (Part 2), IS 1501 (Part 3), ISO 6507-2, ISO 6507-3, ASTM E92 & ASTM E384	0 to 1.2 mm	0.8%
29	MECHANICAL- HARDNESS TESTING MACHINES	Verification of diameter measuring system for Brinell hardness Tester (Direct Verification)	Using glass scale as per IS 1500 (Part 2), IS 1500 (Part 3), ISO 6506-2, ISO 6506-3 & ASTM E10	0 to 6.5 mm	0.6%





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		3.0	Site Facility		
1	MECHANICAL- DIMENSION (PRECISION INSTRUMENTS)	Extensometer	Using Extensometer calibration fixture, Electronic probe and DRO, as per IS 12872 & ASTM E83 by comparison method	Up to 5 mm	3.0 µm for IS method 300 µm for ASTM method
2	MECHANICAL- HARDNESS TESTING MACHINES	Brinell Hardness Testing Machine (HBW 5/750)	Using Hardness Standard Blocks by Indirect Method as per IS 1500 (Part 2), ISO 6506-2 & ASTM E10	up to 650 HBW 5/750	1.9%
3	MECHANICAL- HARDNESS TESTING MACHINES	Brinell Hardness Testing Machine (Scale HBW 10/3000)	Using Hardness Standard Blocks by Indirect Method as per IS 1500 (Part 2), ISO 6506-2 & ASTM E10	up to 650 HBW 10/3000	1.3%
4	MECHANICAL- HARDNESS TESTING MACHINES	Brinell Hardness Testing Machine (Scale HBW 2.5/62.5)	Using Hardness Standard Blocks by Indirect Method as per IS 1500 (Part 2), ISO 6506-2 & ASTM E10	up to 250 HBW 2.5/62.5	2.2%





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5	MECHANICAL- HARDNESS TESTING MACHINES	Brinell Hardness Testing Machine (Scale: HBW 10/1000)	Using Hardness Standard Blocks by Indirect Method as per IS 1500 (Part 2), ISO 6506-2 & ASTM E10	up to 250 HBW 10/1000	1.4%
6	MECHANICAL- HARDNESS TESTING MACHINES	Brinell Hardness Testing Machine (Scale: HBW 10/500)	Using Hardness Standard Blocks by Indirect Method as per IS 1500 (Part 2), ISO 6506-2 & ASTM E10	up to 250 HBW 10/500	1.6%
7	MECHANICAL- HARDNESS TESTING MACHINES	Brinell Hardness Testing Machine (Scale: HBW 2.5/187.5)	Using Hardness Standard Blocks by Indirect Method as per IS 1500 (Part 2), ISO 6506-2 & ASTM E10	up to 650 HBW 2.5/187.5	1.9%
8	MECHANICAL- HARDNESS TESTING MACHINES	Brinell Hardness Testing Machine (Scale: HBW 5/250)	Using Hardness Standard Blocks by Indirect Method as per IS 1500 (Part 2), ISO 6506-2 & ASTM E10	up to 250 HBW 5/250 to	1.5%
9	MECHANICAL- HARDNESS TESTING MACHINES	Force Verification of Rockwell hardness Tester(Direct Verification)	Using load cell as per IS 1586 (Part2), IS 1586 (Part 3), ISO 6508-2, ISO 6508-3 & ASTM E18	29.42 N to 1471 N	1.4%





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10	MECHANICAL- HARDNESS TESTING MACHINES	Force Verification of Rockwell hardness Tester(Direct Verification)	Using load cell as per IS 1586 (Part2), IS 1586 (Part 3), ISO 6508-2, ISO 6508-3 & ASTM E18	29.42N 98.07 N 147.1 to 1	0.3% for 29.42 N 0.13% for 98.07 N 0.1% for 147.1 to 1471 N%
11	MECHANICAL- HARDNESS TESTING MACHINES	Force Verification of Vickers hardness Tester(Direct Verification)	Using Load cell as per IS 1501 (Part 2), IS 1501 (Part 3), ISO 6507-2, ISO 6507-3, ASTM E92 & ASTM E384	0.4903 N 0.9807 N to 490.	0.2% for 0.4903N 0.1% for 98.07 to 490.35 N%
12	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	10 HR 45TW to 72 HR 45TW	1.17HR 45TW
13	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	10 HRBW to 100 HRBW	1.2 HRBW
14	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	10 HRC to 70 HRC	0.49HRC





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15	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	20 HR 45N to 77 HR 45N	0.82HR 45N
16	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	20 HRA to 95 HRA	0.68HRA
17	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	29 HR 30 TW to 82 HR 30TW	1.12HR 30TW
18	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	42 HR 30N to 86 HR 30N	0.77HR 30N
19	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	67 HR 15TW to 93 HR 15TW	1.31HR 15TW
20	MECHANICAL- HARDNESS TESTING MACHINES	Rockwell Hardness Testing Machine	Using Hardness Standard Blocks by Indirect Method as per IS 1586-2, ISO 6508-2 & ASTM E18	70 HR 15N to 95 HR 15N	0.86HR 15N





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21	MECHANICAL- HARDNESS TESTING MACHINES	Verification of depth measuring system of Rockwell hardness tester (Direct Calibration)	As per IS 1586 (Part 2), ISO 6508-2 and ASTM E18	up to 0.25 mm	0.003mm
22	MECHANICAL- HARDNESS TESTING MACHINES	Verification of diagonal measuring system for Vickers hardness Tester (Direct Verification)	Using glass scale as per IS 1501 (Part 2), IS 1501 (Part 3), ISO 6507-2, ISO 6507-3, ASTM E92 & ASTM E384	0 to 1.2 mm	0.8%
23	MECHANICAL- HARDNESS TESTING MACHINES	Verification of diameter measuring system for Brinell hardness Tester (Direct Verification)	Using glass scale as per IS 1500 (Part 2), IS 1500 (Part 3), ISO 6506-2, ISO 6506-3 & ASTM E10	0 to 6.5 mm	0.6%
24	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 0.05)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2, ASTM E92 & ASTM E384	up to 232 HV0.05	8.4%
25	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 0.1)	Using Hardness Standard Blocks by Indirect Method as per IS 1501-2, ISO 6507-2, ASTM E92 & ASTM E384	up to 464 HV 0.1	7.5%





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26	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 0.2)	Using Hardness Standard Blocks by Indirect Method as per IS 1501-2, ISO 6507-2, ASTM E92 & ASTM E384	up to 900 HV0.2	2 7.4%	
27	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (hv 0.3)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2, ASTM E92 & ASTM E384	up to 1350 HV0.3	6.0%	
28	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 0.5)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2, ASTM E92 & ASTM E384	up to 1500 HV0.5	5.6%	
29	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 1)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2, ASTM E92 & ASTM E384	up to 1500 HV 1	4.7%	
30	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 10)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2 & ASTM E92	up to 1500 HV 10	2.2%	





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31	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 20)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2 & ASTM E92	up to 1500 HV 20	2.2%
32	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 30)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2 & ASTM E92	up to 1500 HV 30	1.9%
33	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 5)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2, ASTM E92	up to 1500 HV 5	2.04%
34	MECHANICAL- HARDNESS TESTING MACHINES	Vickers Hardness Testing Machine (HV 50)	Using Hardness Standard Blocks by Indirect Method as per IS 1501 (Part 2), ISO 6507-2 & ASTM E92	up to 1500 HV 50	1.6%
35	MECHANICAL- IMPACT TESTING MACHINE	Izod Impact Testing Machine	Using Clinometer, Load Cell & other instruments & gauges by direct method as per BS 131-IV: 1972	0 to 170 Joule	0.77%





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36	MECHANICAL- UTM, TENSION CREEP AND TORSION TESTING MACHINE	Force/Uni-axial Testing Machine (UTM) - Tension Mode	Using Force proving Instruments as per IS 1828 and ISO 7500	1 kN to 100 kN	0.78%
37	MECHANICAL- UTM, TENSION CREEP AND TORSION TESTING MACHINE	Force/Uni-axial Testing Machine (UTM, CTM)- Compression Mode	Using Force proving Instruments as per IS 1828, ISO 7500 and ASTM E4	1 kN to 1000 kN	0.54%

^{*} CMCs represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k = 2.