Fine (Mirashi) Calibration and Testing Laboratory LLP

Fine Manufacturing Industries, B-7/12, MIDC Area
Miraj, Dist. Sangli, Maharashtra, India - 416 410.
☎: +919503874245
✉:response@finemanufacturing.com

CC-4429

Calibration Certificate for Brinell Hardness Reference Block

Date of calibration	Date of issue	Page	Certificate number
30 July 2025	30 July 2025	1 of 2	ULR-CC442925000100326F

Customer details:	Fine Manufacuring Industries, B-7/12, MIDC Area, Miraj, District Sangli, Maharashtra, India. Pin code: 416410

Reference Hardness Block Serial No:	B2454/2025
Hardness of reference block:	412.18 HBW 10/3000
Make:	Fine Manufacturing Industries (FMI)
Type:	Steel

Reference Hardness Block Scale:	HBW 10/3000
Reference Hardness Block Thickness:	6.72 mm
Shape:	Circular
Temperature:	(25.1 ± 1)° C
Humidity:	(68 ± 10)%

Standard used and traceability: The above Reference Hardness Block is calibrated on a standardising machine at FMCTL. The standardising machine is directy calibrated as per the requirements of ISO 6506-3 and ASTM E10 annex A2. The standardising machine is calibrated using devices traceable to the SI system of units and/or units of measurement realised at NPL-India, NPL-UK, IMGC, NIST or PTB either directly or through NABL, UKAS, NVALP or DAkkS accredited laboratories.

Validity: ISO 6506-3 validity clause 9: The reference block is only valid for the scale for which it was calibrated. The calibration validity should be limited to a duration of five years. Attention is drawn to the fact that, for Al- and Cu-alloys, the calibration validity should be reduced to two to three years.

Calibration Method: FMCTL/SOP/Brinell test blocks, based on IS 1500 (Part 3): 2019, ISO 6506-3:2014 and ASTM E10-23

Results

After the preliminary visual inspection of the test surface and supporting surface of the block, the hardness indentations were taken and measured at five different places uniformly distributed throughout the test surface of the block.

Indents	1	*2d1	*2d2	3	4	5
Diameters in mm	3.0050	3.000	3.010	3.0150	3.0025	3.0185
Hardness value in HBW 10/3000	413.36	413.36		410.55	414.06	409.58
Hardness test parameters:	Applied test force:			29421.0 N		
	Dwell time of test force:			14.0 s		

*Diameters of reference indentation

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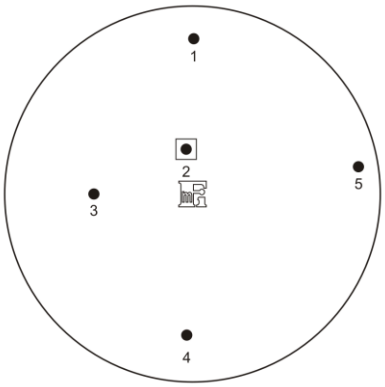
*Orientation of the reference indentation on the block:
The reference indentation is taken inside the laser marked square near the center of the block.
(Only on FMI make blocks. On other make blocks, marked if customer has requested)



Mean value of the diameters: 3.0092 mm

Non-uniformity of measured diameters: 0.53% (d) | 16.0 µm

Maximum permissible non-uniformity: IS 1500 (Part 3)/ISO 6506-3: 1.0% (d)
ASTM E10: 1.0% (d)

Hardness of the reference block: 412.18 HBW 10/3000

Expanded uncertainty of measurment: ± 1.19% (HBW) (k = 2.00)

Conformity Statement based on non-uniformity of the block	
As per IS 1500 (Part 3) & ISO 6506-3:	PASS
As per ASTM E10:	PASS

Approved Signatory		
	A K Mirashi	K S Mirashi

Note:
1) The reported expanded uncertainty of calibration of hardness block includes the standard uncertainty due to the non-uniformity of the reference block and the CMC of the standardising machine. The reported expanded uncertainty is based on combined standard uncertainty multiplied by a coverage factor k (as reported above), providing a level of confidence of approximately 95%
2) This calibration certificate shall not be reproduced, except in full, unless prior written permission from the CEO, FMCTL.
3) This calibraation certificate is invalid without signature.

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