

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 UKAS CALIBRATION 21733 Accredited to ISO/IEC 17025:2017	Hardness Calibrations Ltd	
	Issue No: 002 Issue date: 25 August 2021	
	20-22 Wenlock Road Hoxton London N1 7GU	Contact: Keatan Pangli Tel: +44 (0) 121 439 5540 E-Mail: service@hardnesscalibrations.com Website: www.hardnesscalibrations.com
Calibration performed by the Organisation at the locations specified		

Locations covered by the organisation and their relevant activities

Site activities performed away from the locations listed above:

Location details	Activity	Location code
At customer's premises Contact: Mr K Pangli	Hardness Testing machines, Brinell, direct Testing machines, Brinell, indirect Testing machines, Vickers, direct Testing machines, Vickers, indirect Testing machines, Knoop, direct Testing machines, Knoop, indirect Testing machines, Rockwell, direct Testing machines, Rockwell, indirect	Site



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Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
CERTIFICATION OF HARDNESS TESTING MACHINES IN SERVICE			NOTES	All Sites
Direct verification of Vickers & Knoop hardness testing machines	Vickers and Knoop scales: HV 5 to HV 100 HV 0.1 to HV 5 HV 0.025 to HV 0.05 HK 0.01 to HK 1 Force Time Length	See note 1 0.20% 0.10 second 0.50 μ m	Note 1 The verification shall be in accordance with the requirements of BS EN ISO 6507-2:2018 ASTM E92-17 ASTM E384-17 or BS EN ISO 4545-2:2017	
Indirect verification of Vickers & Knoop hardness testing machines & indentation measuring devices	Vickers scales: HV 100 200 HV 100 400 HV 100 700 HV 50 200 HV 50 400 HV 50 700 HV 30 200 HV 30 400 HV 30 700 HV 20 200 HV 20 400 HV 20 700 HV 10 200 HV 10 400 HV 10 700 HV5 200 HV5 400 HV5 700 HV3 200 HV3 400 HV3 700	See note 1 1.0 HV 3.1 HV 5.5 HV 1.3 HV 3.7 HV 7.1 HV 1.4 HV 4.4 HV 8.6 HV 1.5 HV 5.1 HV 9.9 HV 3.1 HV 7.7 HV 15 HV 2.4 HV 9.0 HV 18 HV 3.0 HV 11 HV 22 HV		All sites



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Indirect verification of Vickers & Knoop hardness testing machines & indentation measuring devices (cont'd)	HV2.5 200	3.3 HV		All Sites
	HV2.5 400	12 HV		
	HV2.5 700	24 HV		
	HV2 200	3.6 HV		
	HV2 400	14 HV		
	HV2 700	26 HV		
	HV1 200	4.8 HV		
	HV1 400	19 HV		
	HV1 700	36 HV		
	HV 0.5 200	6.6 HV		
	HV 0.5 400	26 HV		
	HV 0.5 700	51 HV		
	HV 0.3 200	8.4 HV		
	HV 0.3 400	32 HV		
	HV 0.3 700	54 HV		
	HV 0.2 200	10 HV		
	HV 0.2 400	39 HV		
	HV 0.2 700	80 HV		
	HV 0.1 200	14 HV		
	HV 0.1 400	49 HV		
HV 0.05 100	7.0 HV			
HV 0.05 200	20 HV			
HV 0.05 232	25 HV			
HV 0.025 100	13 HV			



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Indirect verification of Vickers & Knoop hardness testing machines & indentation measuring devices (cont'd)	Knoop scales:		See note 1	All Sites
	HK 1 200	5.3 HK		
	HK 1 400	16 HK		
	HK 1 700	27 HK		
	HK 0.5 200	5.9 HK		
	HK 0.5 400	18 HK		
	HK 0.5 700	32 HK		
	HK 0.3 200	6.6 HK		
	HK 0.3 400	21 HK		
	HK 0.3 700	38 HK		
	HK 0.2 200	7.2 HK		
	HK 0.2 400	23 HK		
	HK 0.2 700	46 HK		
	HK 0.1 200	8.9 HK		
	HK 0.1 400	29 HK		
	HK 0.1 700	54 HK		
	HK 0.05 200	11 HK		
	HK 0.05 400	37 HK		
	HK 0.05 700	71 HK		
	HK 0.025 200	14 HK		
	HK 0.025 400	48 HK		
	HK 0.025 700	95 HK		
	HK 0.01 100	7.2 HK		
	HK 0.01 200	19 HK		
HK 0.01 300	43 HK			



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Direct verification of Brinell hardness testing machines	Brinell scales: From HB 10/3000 to HB 1/1	See note 2	Note 2 The calibration/ verification shall be in accordance with the requirements of BS EN ISO 6506-2:2018 or ASTM E10-18	All Sites
	Force Time Length	0.20 % force 0.10 s 1.0 μ m		
Indirect verification of Brinell hardness testing machines	Scale 10/3000 600 HBW to 140 HBW	See note 2 8.0 HBW to 1.0 HBW		All sites
	Scale 10/1000 218 HBW to 55 HBW	1.4 HBW to 1.2 HBW		
	Scale 10/500 109 HBW to 50 HBW	1.2 HBW to 1.1 HBW		
	Scale 5/750 500 HBW to 140 HBW	4.2 HBW to 1.7 HBW		
	Scale 5/250 218 HBW to 55 HBW	1.9 HBW to 1.1 HBW		
	Scale 5/125 109 HBW to 48 HBW	1.2 HBW to 1.1 HBW		
	Scale 2.5/187.5 500 HBW to 100 HBW	4.2 HBW to 1.7 HBW		
	Scale 2.5/62.5 218 HBW to 55 HBW	1.9 HBW to 1.2 HBW		
	Scale 2.5/31.25 109 HBW to 50 HBW	1.2 HBW to 1.1 HBW		
	Scale 1/30 600 HBW to 100 HBW	5.7 HBW to 1.8 HBW		
	Scale 1/10 141 HBW to 53 HBW	2.1 HBW to 1.1 HBW		
	Scale 1/5 109 HBW to 48 HBW	1.2 HBW to 1.1 HBW		
	Scale 1/1 21.8 HBW to 3.18 HBW	1.2 HBW to 1.1 HBW		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Direct verification of Rockwell hardness testing machines	Rockwell scales: A, B, C, D, E, F, G, H, K, L, M, P, R, S, V, N, T, W, X & Y	See note 3	Note 3 The calibration/ verification shall be in accordance with the requirements of BS EN ISO 6508-2:2015 & ASTM E18-20.	All sites
	Force Time Length	0.20% 0.10 s 0.40 μm		
Indirect verification of Rockwell hardness testing machines	Rockwell scales:	See note 3		All sites
	HRA Scale 80 to 88 70 to 75 20 to 40	0.16 HRA 0.17 HRA 0.29 HRA		
	HRBW Scale 80 to 90 50 to 80 40 to 50	0.42 HRBW 0.87 HRBW 1.0 HRBW		
	HRC Scale 60 to 70 40 to 60 20 to 40	0.32 HRC 0.33 HRC 0.38 HRC		
	HRD Scale 70 to 80 50 to 70 40 to 50	0.18 HRD 0.26 HRD 0.28 HRD		
	HREW Scale 94 to 100 80 to 90 65 to 75	0.55 HREW 0.55 HREW 0.55 HREW		
	HRFW Scale 94 to 100 80 to 90 65 to 75	0.41 HRFW 0.41 HRFW 0.54 HRFW		
	HRGW Scale 55 to 75	0.31 HRGW		
	HRHW Scale 80 to 94	0.41 HRHW		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Indirect verification of Rockwell hardness testing machines (cont'd)	Rockwell Scales:	See Note 3		All sites
	HRKW Scale 60 to 40	0.41 HRKW		
	HRLW Scale 114 to 123 90 to 114	0.36 HRLW 0.36 HRLW		
	HRMW Scale 100 to 118 68 to 100	0.57 HRMW 0.57 HRMW		
	HRPW Scale 85 to 112 40 to 85	0.65 HRPW 0.65 HRPW		
	HRRW Scale 100 to 120	0.24 HRRW		
	HRSW Scale 110 to 112	0.20 HRSW		
	HRVW Scale 80 to 104	0.21 HRVW		
	HR15N Scale 89 to 94 78 to 88 70 to 77	0.19 HR15N 0.19 HR15N 0.40 HR15N		
	HR15TW Scale 88 to 93 81 to 87 67 to 80	0.22 HR15TW 0.22 HR15TW 0.38 HR15TW		
	HR15WW Scale 89 to 100 80 to 88	0.44 HR15W 0.44 HR15W		
	HR15XW Scale 88 to 100	0.35 HR15XW		
	HR15YW Scale 94 to 100	0.63 HR15YW		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Indirect verification of Rockwell hardness testing machines (cont'd)	Rockwell Scales: HR30N Scale 74 to 86 55 to 73 42 to 54 HR30TW Scale 70 to 82 57 to 69 29 to 56 HR30WW Scale 65 to 100 HR30X Scale 79 to 100 HR30YW Scale 88 to 100 HR45N Scale 63 to 77 32 to 61 20 to 31 HR45TW Scale 55 to 72 34 to 54 10 to 33	See Note 3 0.28 HR30N 0.28 HR30N 0.55 HR30N 0.40 HR30TW 0.66 HR30TW 0.90 HR30TW 0.76 HR30WW 0.16 HR30XW 0.38 HR30YW 0.19 HR45N 0.22 HR45N 0.43 HR45N 0.41 HR45TW 0.41 HR45TW 0.73 HR45TW		All sites
END				



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Appendix - Calibration and Measurement Capabilities

Introduction

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

Calibration and Measurement Capabilities (CMCs)

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest measurement uncertainty that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors.

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The measurement uncertainty is calculated according to the procedures given in the GUM and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published measurement uncertainty in certificates issued under its accreditation.

Expression of CMCs - symbols and units

It should be noted that the percentage symbol (%) represents the number 0.01. In cases where the measurement uncertainty is stated as a percentage, this is to be interpreted as meaning percentage of the measurand. Thus, for example, a measurement uncertainty of 1.5 % means $1.5 \times 0.01 \times q$, where q is the quantity value.

The notation $Q[a, b]$ stands for the root-sum-square of the terms between brackets: $Q[a, b] = [a^2 + b^2]^{1/2}$