

# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

 <b>0252</b>  Accredited to <b>ISO/IEC 17025:2005</b>	<b>R&amp;H Testing Services Ltd</b>	
	<b>Issue No: 038</b>	<b>Issue date: 18 January 2012</b>
	Unit 7 Cannel Road Chase Terrace Burntwood Business Park Burntwood Staffordshire WS7 3FU	Contact: Mr R J Chamberlain Tel: +44 (0)1543-677400 Fax: +44 (0)1543-677477 E-Mail: sales@randhtesting.com Website: http://www.randhtesting.com
<b>Calibration performed by the Organisations at the locations specified below</b>		

### Locations covered by the organisation and their relevant activities

#### Site activities performed away from the locations listed above:

Location details	Activity	Location code
Any customer's premises      Contact: Mr R J Chamberlain	Force Hardness	Site



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DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k=2$ )	Remarks	Location Code
<p>FORCE</p> <p>UNIVERSAL MATERIALS TESTING MACHINES</p> <p>Verification and calibration of the force measuring system by force proving instruments in tension</p> <p>Verification and calibration of the force measuring system by force proving instruments in compression</p> <p>Verification and calibration of the force measuring system by calibrated masses in tension and compression</p> <p>TENSION CREEP TESTING MACHINES</p> <p>Verification of the applied load using force proving instruments</p> <p>Verification of the applied load using masses</p>	<p>From 0.02 kN up to 1080 kN for Class 0.5, 1, 2 and 3 machines to BS EN ISO 7500-1:2004</p> <p>From 0.02 kN up to 3000 kN for Class 1, 2 and 3 machines to BS EN ISO 7500-1:2004 and ASTM E4-09</p> <p>From 0.02 kN up to 1080 kN for Class 0.5, 1, 2, and 3 machines to BS EN ISO 7500-1:2004</p> <p>From 0.02 kN up to 3000 kN for Class 1, 2 and 3 machines to BS EN ISO 7500-1:2004 and ASTM E4-09</p> <p>From 0.10 N up to 50 N for Class 0.5, 1, 2 and 3 machines to BS EN ISO 7500-1:12004 and ASTM E4-09</p> <p>From 0.02 kN up to 500 kN for Class 0.5, 1.0 and 2.0 machines to BS EN ISO 7500-2:2006</p> <p>From 0.1 N up to 50 N for Class 0.5, 1.0 and 2.0 machines to BS EN ISO 7500-2:2006</p>	<p>0.26 %</p> <p>0.33 %</p> <p>0.26 %</p> <p>0.33 %</p> <p>0.10 %</p> <p>0.26 %</p> <p>0.10 %</p>		All Site



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Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k=2$ )	Remarks	Location Code
IMPACT TESTING MACHINES				All Site
Charpy -	BS EN 10045-2:1993 ISO 148-2:2008 ASTM E23-2000 but excluding proof test using certified specimens. ISO 13802:2006	0.70 J	1 The calibration/ verification shall be in accordance with the requirements of BS EN ISO 6508:2005, & ASTM E18-08	
Plastics - Izod - Plastics -	BS 131:Part 4:1972 ISO 13802:2006			
LENGTH				
Extensometers	As BS EN ISO 9513:2002 for the following classes and gauge lengths:  Class 0.2 from 25 mm Class 0.5 from 10 mm Class 1 from 5 mm Class 2 from 5 mm  Displacements 0.02 mm to 2.5 mm 2.5 mm to 10 mm 10 mm to 50 mm  As ASTM E83-06 for the following classes and gauge lengths:  B-1 from 20 mm B-2 from 10 mm C from 5 mm  Displacements 0.02 mm to 2.5 mm 2.5 mm to 10 mm 10 mm to 50 mm	1.4 $\mu$ m 7.1 $\mu$ m 21 $\mu$ m	2 The calibration/ verification shall be in accordance with the requirements of BS EN ISO 6506:2005 & ASTM E10-10.  3 The verification shall be in accordance with the requirements of BS EN ISO 6507:2005 & ASTM E384-10	
Testing machine crosshead displacement	2 mm to 100 mm 100 mm to 500 mm 500 mm to 1000 mm	0.03 mm 0.14 mm 0.30 mm		
Extensometers, Long travel	As BS ISO 5893:2002 for classes C, D and E			
Displacement	2 mm to 100 mm 100 mm to 1000 mm	0.03 mm 0.30 mm		
Speed	As BS ISO 5893:2002  10 mm/min to 50 mm/min 50 mm/min to 500 mm/min	1.5% 0.6%		



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Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k=2$ )	Remarks	Location Code
<b>CERTIFICATION OF HARDNESS TESTING MACHINES IN SERVICE</b>				
Direct verification of Vickers hardness testing machines	Vickers scales: HV 5 to HV 100 HV 0.2 to HV 3 Force  Time  Length	See note 3  0.24%  0.1 second  2 $\mu$ m		
Indirect verification of Vickers hardness testing machines	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  HV1 200 HV1 400 HV1 700  HV 0.5 200 HV 0.5 400 HV 0.5 700  HV 0.3 200 HV 0.3 400 HV 0.3 700  HV 0.2 200 HV 0.2 400 HV 0.2 700	See Note 3 1.2 HV 3.4 HV 4.1 HV  1.9 HV 3.5 HV 6.3 HV  2.0 HV 4.4 HV 9.3 HV  2.5 HV 6.2 HV 11.0 HV  3.1 HV 7.7 HV 14.9 HV  3.9 HV 11.0 HV 19.7 HV  6.9 HV 16.3 HV 31.0 HV  8.7 HV 21.4 HV 44.0 HV  5.0 HV 15.0 HV 17.0 HV  6.0 HV 16.0 HV 19.0 HV  7.0 HV 17.0 HV 20.0 HV		



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<b>CERTIFICATION OF HARDNESS TESTING MACHINES IN SERVICE</b>				
Indirect verification of Vickers hardness testing machines (cont'd)	Vickers scales: HV 0.1 200 HV 0.1 400 HV 0.1 700	See Note 3 10.0 HV 30.0 HV 40.0 HV		
Direct verification of Brinell hardness testing machines	Brinell scales: From HB 10/3000 to HB 1/30 Force  Time  Length	See Note 2  0.24%  0.1 second  10 $\mu$ m		
Indirect verification of Brinell hardness testing machines	Brinell scales: Scale 10/3000 600HBW to 140 HBW  Scale 10/1500 299 HBW to 55 HBW  Scale 10/1000 169 HBW to 55 HBW  Scale 5/750 600 HBW to 140 HBW  Scale 5/250 169 HBW to 55 HBW  Scale 2.5/187.5 600 HBW to 140 HBW  Scale 1/1 21.8 HBW to 3.18 HBW	See Note 2  8.0 HBW to 2.2 HBW  4.1 HBW to 1.2 HBW  2.3 HBW to 1.2 HBW  9.8 HBW to 2.4 HBW  2.7 HBW to 1.3 HBW  16 HBW to 2.9 HBW  1.04 HBW to 0.09 HBW		
Direct verification of Rockwell hardness testing machines	Rockwell scales: A, B, C, D, E, F, G, H, K, N & T Force  Time  Depth	See Note 1  0.24%  0.1 Seconds  0.1 $\mu$ m		
Indirect verification of Rockwell hardness testing machines	Rockwell scales: HRA Scale 86 to 85 70 to 79 60 to 69  HRB Scale 80 51 to 79 10 to 50	See Note 1  0.15 HRA 0.16 HRA 0.28 HRA  0.42 HRB 0.87 HRB 1.36 HRB		



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Indirect verification of Rockwell hardness testing machines (cont'd)	Rockwell scales	See Note 1		
	HRC Scale			
	60 to 70	0.31 HRC		
	40 to 59	0.32 HRC		
	20 to 39	0.37 HRC		
	HRD Scale			
	70 to 80	0.17 HRD		
	50 to 69	0.25 HRD		
	40 to 49	0.27 HRD		
	HRE Scale			
	89	0.54 HRE		
	75 to 88	0.54 HRE		
	65 to 87	0.54 HRE		
	HRF Scale			
	87	0.40 HRF		
	70 to 86	0.40 HRF		
	40 to 69	0.54 HRF		
	HRG Scale			
	80	0.30 HRG		
40 to 79	0.30 HRG			
10 to 39	0.76 HRG			
HRH Scale				
90	0.40 HRH			
80 to 89	0.40 HRH			
60 to 79	0.68 HRH			
HRK Scale				
70	0.40 HRK			
30 to 69	0.40 HRK			
10 to 29	0.64 HRK			
HRL Scale				
115	0.35 HRL			
90 to 114	0.35 HRL			
HRM Scale				
100	0.56 HRM			
70 to 99	0.56 HRM			
HRP Scale				
85	0.65 HRP			
40 to 84	0.91 HRP			
HRR Scale				
120	0.23 HRR			
100 to 119	0.40 HRR			



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<b>CERTIFICATION OF HARDNESS TESTING MACHINES IN SERVICE</b>				
Indirect verification of Rockwell hardness testing machines (cont'd)	Rockwell Scales: HRS Scale 112 110 to 111	See Note 1 0.19 HRS 0.91 HRS		
	HRV Scale 104 to 81 80 to 103	0.20 HRV 0.61 HRV		
	HR15N Scale 90 to 95 80 to 89 40 to 79	0.18 HR15N 0.18 HR15N 0.39 HR15N		
	HR15T Scale 88 to 100 80 to 87 20 to 79	0.21 HR15T 0.21 HT15T 0.37 HR15T		
	HR15W Scale 89 to 100 80 to 88	0.53 HR15W 0.44 HR15W		
	HR15X Scale 88 to 100 80 to 87	0.33 HR15X 0.62 HR15X		
	HR15Y Scale 94 to 100 85 to 93	0.63 HR15Y 1.30 HR15Y		
	HR30N Scale 77 to 85 60 to 76 40 to 59	0.27 HR30N 0.27 HR30N 0.55 HR30N		
	HR30T Scale 57 to 85 50 to 56 20 to 49	0.39 HR30T 0.66 HR30T 0.90 HR30T		
	HR30W Scale 65 to 100 40 to 64	0.76 HR30W 0.90 HR30W		
	HR30X Scale 79 to 100 60 to 78	0.15 HR30X 0.99 HR30X		
	HR30Y Scale 88 to 100 60 to 87	0.37 HR30Y 0.82 HR30Y		



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CERTIFICATION OF HARDNESS TESTING MACHINES IN SERVICE				
Indirect verification of Rockwell hardness testing machines (cont'd)	Rockwell scales HR45N Scale 67 to 75 50 to 66 10 to 49  HR45T Scale 50 to 75 40 to 49 10 to 39  HR45W Scale 49 to 100 10 to 47  HR45X Scale 69 to 100 40 to 68  HR45Y Scale 82 to 100 60 to 81	See Note 1  0.18 HR45N 0.21 HR45N 0.43 HR45N  0.40 HR45T 0.40 HR45T 0.73 HR45T  0.12 HR45W 0.29 HR45W  0.34 HR45X 0.81 HR45X  0.29 HR45Y 0.94 HR45Y		
END				