


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

| | | |
|--|--|---|
|  0233 Accredited to ISO/IEC 17025:2005 | Opus Metrology Limited | |
| | Issue No: 034 Issue date: 3 December 2010 | |
| | Unit 34 Maylan Road Earlstrees Industrial Estate Corby Northamptonshire NN17 4DR | Contact: Mr J Tomlinson Tel: +44 (0)1536-204681 Fax: +44 (0)1536-205272 E-Mail: sales@opus.co.uk Website: www.opus.co.uk |

Calibration performed by the Organisations at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

| Location details | Activity | Location code |
|---|--|----------------------|
| Address Unit 34 Maylan Road Earlstrees Industrial Estate Corby Northamptonshire NN17 4DR | Local contact Mr J Tomlinson | Dimensional A |

Site activities performed away from the locations listed above:

| Location details | Activity | Location code |
|-----------------------|----------------|----------------------|
| At customers premises | Mr J Tomlinson | Dimensional B |



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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 |
|--|---|---|---|------------------|
| RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED | | | | |
| LENGTH | | | NOTES | |
| Gauge blocks | | Class (see notes) | 1. All linear calibrations may be given in inch units. 2. Features and associated parts of these gauges / fixtures can be measured to the uncertainties given for equivalent items listed in this schedule 3. The uncertainties stated apply to the calibration of tungsten carbide balls and for all other balls when the roundness error does not exceed 0.13 μ m on radius. 4. The uncertainty quoted is for the departure from flatness, straightness, or squareness, i.e. the distance separating the two parallel planes which just enclose the surface under consideration. | A |
| Inch (Steel, tungsten carbide & ceramic) | As BS 4311-1:2007 0.01 inch to 0.4 inch. 0.4 inch up to 1 inch Size 2 inch Size 3 inch Size 4 inch | A B C D 1.0 2.0 3.0 4.0 1.5 2.5 4.0 5.0 2.5 3.5 5.0 7.0 3.0 4.5 6.0 8.0 3.5 5.0 7.0 10 | | |
| Millimetre (Steel, tungsten carbide & ceramic) | As BS EN ISO 3650:1999 0.1 to 10 10 to 25 30, 40, 50 60, 70, 75 80, 90, 100 | A B C D .030 .050 .080 .10 .040 .060 .10 .13 .060 .090 .12 .17 .070 .11 .15 .21 .090 .13 .18 .25 | | |
| | 100 to 1500 | 0.20 + (1.0 x length in m) | | |
| Interferometry Class A uncertainties apply to the measurement of length by interferometry of grade K standards of length to BS 4311:2007 and BS EN ISO 3650:1999 when they are measured twice, wrung to a platen by each of the two measuring faces in turn, and the mean of these two measurements stated. Class B uncertainties apply to the measurement of length by interferometry of grade K standards of length to BS 4311:2007 and BS EN ISO 3650:1999 when they are measured once, wrung to a platen by, if not otherwise specified, the left hand (unmarked) measuring face. | | | | |
| Comparison Class C uncertainties apply to the measurement of length of gauges by comparison with grade K standards of length of a similar material. Class C uncertainties apply to new and used grade 0, 1 and 2 gauges to BS 4311:2007 and BS EN ISO 3650:1999. Class D uncertainties represent the best capability for the measurement of length of gauges by comparison with K grade standards of length of a dissimilar material. | | | | |
| Length bars Inspection, workshop and Grades 1 and 2 | As BS 1790:1961 and BS 5317:1976 10 to 1500 | 0.20 + (1.0 x length in m) | | A |
| Gauge block accessories | As BS 4311-2:2009 0 to 100 | 0.30 | | A |
| Length bar accessories | As BS 1790:1961 and BS 5317:1976 0 to 100 | 0.30 | | A |



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| RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED | | | | |
| LENGTH (cont'd) | | | NOTES (cont'd) | |
| Thread measuring cylinders | As BS3777:1964 and BS 5590:1978 and specials 0.1 to 5.0 diameter | 0.50 | 5. Single start, symmetrical thread forms only. | A |
| Plain plug gauges (parallel), cylindrical setting standards, gear measuring cylinders and rollers. | 1 to 100 diameter 100 to 150 150 to 200 200 to 300 300 to 400 | 0.80 1.0 1.5 2.0 4.0 | 6. Single and multi-start symmetrical thread forms only. | A |
| Plain plug gauges (taper) | | on diameter | | |
| Taper up to 1 in 8 on diameter | 6 to 50 diameter 50 to 100 100 to 150 | 3.0 4.0 5.0 | | A |
| Taper above 1 in 8 and up to 1 in 3 on diameter | 6 to 50 diameter 50 to 150 150 to 200 | 5.0 6.0 7.0 | | A |
| Paint thickness setting foils | 0.01 to 8 | 2.0 | | A |
| Plain ring gauges (parallel) and setting standards | 1 to 10 diameter 10 to 25 25 to 50 50 to 100 100 to 150 150 to 300 | 1.0 0.80 1.0 1.5 2.0 2.5 | | A |
| Plain ring gauges (taper) | | | | |
| Taper up to 1 in 8 on diameter | 6 to 50 diameter 50 to 100 100 to 150 150 to 300 | 4.0 5.0 6.0 7.0 | | A |
| Taper above 1 in 8 and up to 1 in 3 on diameter | 6 to 50 diameter 50 to 100 100 to 150 150 to 200 | 6.0 7.0 8.0 9.0 | | A |
| Plain gap gauges (parallel) | 1 to 100 diameter 100 to 200 200 to 300 | 2.0 3.0 4.0 | | A |



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| LENGTH (cont'd) | | | | |
| Screw plug gauges (parallel) including check and setting plugs See Note 6 Screw plug gauge (taper) See Note 5 | 1 to 100 diameter 100 to 200 200 to 300 2 to 100 diameter 100 to 200 | 3.0 5.0 8.0 4.0 8.0 | on pitch diameter | A |
| Screw ring gauges (parallel) See Note 5 | 2 to 100 diameter 100 to 200 | 4.0 6.0 | on pitch diameter | A |
| Screw ring gauges (taper) See Note 5 | 14 to 100 diameter 100 to 200 | 5.0 10 | on pitch diameter | A |
| Screw pitch Screw flank angle | 0.2 to 8 0° to 52° | 1.5 5.0 minutes of arc | | A |
| Receiver, position and profile gauges, jigs and fixtures | 0 to 450 x 400 x 300 | 3.0 + (10 x length in m) See Note 2 | | A |
| Parallels | As BS 906:1972 5 to 50 x 100 x 400 | 1.2 to 5.0 | | A |
| Vee blocks | As BS 3731:1987 20 to 150 diameter, vee capacity | 2.5 to 5.0 | | A |
| Engineers Steel Rules | As BS 4372:1968 0 to 2000 | 5.0 + (10 x length in m) | | A |
| Precision scales & graticules | 0 to 400 | 3.0 + (1.0 x length in m) | | A |
| ANGLE | | | | |
| Squares Blade type | As BS 939:2007 50 to 450 | 3.0 | On squareness See Note 4 | A |
| Cylindrical | 75 to 450 450 to 600 600 to 900 | 2.0 4.0 6.0 | | A |
| Block | 50 to 450 | 2.0 | | A |
| Angle plates and box angle plates | As BS 5535:1978 50 to 600 | Squareness: 3.0 + (1.0 per 100 mm) Parallelism: 1.0 + (1.0 per 100 mm) See Note 4 | | A |



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| ANGLE (cont'd) | | | | |
| Sine bars | As BS 3064:1978 100 to 300 | Linear dimensions: 1.0 + (10 x length in m) Overall Performance: 3.0 Seconds of arc | | A |
| Sine tables | As BS 3064:1978 100 to 500 | | | A |
| Sine centres | 100 to 500 length between centres | Linear dimensions: 1.0 + (10 x length in m) Overall performance: 5.0 seconds of arc | | A |
| Compound sine tables | With tables or equivalent of 100 to 500 | | | |
| Bevel protractors | As BS 1685:2008 0° to 360° | 6.0 minutes of arc | | A |
| Combination sets | 0° to 360° (Protractor) 0 to 500 (Rule) | 30 minutes of arc 5.0 + (10 x length in m) | | |
| Combination Angle gauges | 0° to 90° | 1.0 second of arc | | A |
| Polygons | 3 to 36 sides | 1.0 second of arc | | A |
| FORM | | | | |
| Surface plates Granite Cast iron | As BS 817:2008 and above 160 x 100 to 4000 x 4000 | 1.5 + (0.80 x diagonal in m) See Note 1 | | A & B |
| Straightedges Cast iron | As BS 5204:Part 1:1975 300 to 8000 | 1.0 + (2.0 x length in m) See Note 1 | | |
| Steel, Granite | As BS 5204:Part 2:1977 300 to 2000 | | | |
| Optical flats | 10 to 100 diameter 100 to 150 | 0.10 See Note 4 0.12 | | A |
| Optical parallels | 10 to 100 diameter | 0.10 See note 4 | | A |
| Tungsten carbide balls | 1 to 100 diameter | 0.80 On diameter See Note 3 | | A |
| Steel balls | 1 to 100 diameter | | | |



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| MEASURING INSTRUMENTS AND MACHINES | | | | |
| Tesa gauge block comparator | | 0.050 | | A |
| Micrometers | | | | A |
| External | As BS 870:2008 0 to 600 | Heads 2.0 between any two points. Setting and extension rods 0.60+ (3.0 x length in m) | | |
| Internal | As BS 959:2008 0 to 900 | | | |
| Depth | As BS 6468:2008 0 to 300 | | | |
| Three point bore | 3 to 150 | Overall performance 8.0 | | A |
| Micrometer heads | As BS 1734:1951 0 to 100 | 1.0 | | A |
| Height setting micrometer | 0 to 300 | Heads: 1.2 between any two points Stepped column: 1.6 Overall performance: .2.0 | | A |
| Riser blocks for above | 150 300 | 1.0 2.0 | | A |
| Vernier gauges | | | | |
| Caliper | As BS 887:2008 0 to 2000 | Overall performance 10 + (30 x length in m) | | |
| Height | As BS 1643:2008 0 to 2000 | | | |
| Depth | As BS 6365:2008 0 to 600 | | | |
| Dial gauges and dial test indicators | As BS 907:2008 and BS 2795:1981 0 to 50 | 1.0 | | A |
| Vertical measuring | 0 to 1000 | 1.0 | | A & B |
| Horizontal measuring | 0 to 750 | 0.50 + (4.0 x length in m) | | A & B |
| Thread diameter measuring | As NPL MOY/SCMI//9 0 to 300 | Overall performance: 1.5 | | A |
| Spirit levels | As BS 3509:1962 and BS 958:1968 5 seconds of arc to 60 minutes of arc nominal sensitivity | Mean sensitivity 10 % of nominal Minimum of 0.50 seconds of arc | | A |



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| MEASURING INSTRUMENTS AND MACHINES (cont'd) | | | | |
| Clinometers | 0° to 360° | 10 seconds of arc | | A |
| Electronic indicating levels | 0 to 10 minutes of arc | 1.0 % of range Minimum 0.50 seconds of arc | | A |
| Autocollimators Optical Photo-electric | 0 to 60 minutes of arc 0 to 10 minutes of arc | 0.25 seconds of arc | | A |
| Profile projectors | 10 to 100 magnifications | 125 at the screen 6.0 linear 3.0 minutes of arc | | A & B |
| Toolmakers microscope | Up to 150 x 150 | 6.0 linear 3.0 minutes of arc | | A & B |
| Electronic height gauges | Up to 1000 | 1.0 + (5.0 x length in m) | | A & B |
| Indexing tables | 0° to 360° | 0.50 seconds of arc | | A |
| Rotary tables | 100 to 450 capacity | Overall angular performance 2.0 seconds of arc. | | A |
| END | | | | |