


# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

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

|                                                                                                                                                    |                                                                                               |                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>0199</b><br><br>Accredited to<br><b>ISO/IEC 17025:2005</b> | <b>Avon-Dynamic Calibration</b>                                                               |                                                                                                                                                                                                                                                   |
|                                                                                                                                                    | Issue No: 024    Issue date: 05 August 2008                                                   |                                                                                                                                                                                                                                                   |
|                                                                                                                                                    | <b>Unit 24</b><br>Station Road Work Shops<br>Station Road<br>Kingswood<br>Bristol<br>BS15 4PJ | <b>Contact: Mr R Stone</b><br>Tel: +44 (0)117-9701 501<br>Fax: +44 (0)117-9701 500<br>E-Mail: <a href="mailto:info@avon-dynamic.co.uk">info@avon-dynamic.co.uk</a><br>Website: <a href="http://www.avon-dynamic.co.uk">www.avon-dynamic.co.uk</a> |

**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        |
|----------------------------------------------------------------------------------------------------------|------------------------------------|----------------------|
| <b>Address</b><br>Unit 24<br>Station Road Work Shops<br>Station Road<br>Kingswood<br>Bristol<br>BS15 4PJ | <b>Local contact</b><br>Mr R Stone | Dimensional<br><br>A |

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

| Location details      | Activity   | Location code        |
|-----------------------|------------|----------------------|
| At customers premises | Mr R Stone | Dimensional<br><br>B |



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Calibration performed by the Organisation at the locations specified

DETAIL OF ACCREDITATION

| Measured Quantity<br>Instrument or Gauge                                       | Range                                                            | Best<br>Measurement<br>Capability<br>Expressed as an<br>Expanded<br>Uncertainty ( $k=2$ ) | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Location<br>Code |
|--------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES<br>UNLESS OTHERWISE STATED |                                                                  |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
| LENGTH                                                                         |                                                                  |                                                                                           | NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |
| Gauge blocks                                                                   |                                                                  | Class (see notes)                                                                         | <p><b>Class C</b> uncertainties apply to the measurement of length of steel gauges by comparison with grade K standards of length of a similar material. Class C uncertainties apply to new grade 0, 1 and 2 gauges to BS 4311:Part 1:1993 and represent the best capability for all grades of used gauges to BS 4311:Part 3:1993.</p> <p><b>Class D and E</b> uncertainties are the maximum applicable to the measurement of length of steel grade 3 and 4 gauges respectively to BS 4311:Part 3:1993, by comparison with grade K standards of length of a similar material.</p> <p>1 All calibrations must be carried out in accordance with Procedures agreed by UKAS</p> <p>2 In addition to specified items other similar items, including parts of measuring instruments and machines, may be Calibrated (see note 1) to the uncertainties stated. Where the item or part calibrated is lower quality due to wear, errors in geometry of form, poor surface texture, or where any other factor that adversely affects the measurement capability, greater uncertainties must be quoted.</p> |                  |
| Inch (steel)                                                                   | As BS 4311:Parts 1 & 3:1993                                      | C D E                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | A                |
|                                                                                | Up to 0.4 in                                                     | 3 4 6                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | } $\mu$ in       |
|                                                                                | Above 0.4 in up to 1 in                                          | 4 5 8                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
|                                                                                | Size 2 in                                                        | 5 7 10                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
|                                                                                | Size 3 in                                                        | 6 8 12                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
|                                                                                | Size 4 in                                                        | 7 10 14                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
| Millimetre (steel)                                                             | As BS EN ISO 3650:1999                                           |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | A                |
|                                                                                | Up to 10                                                         | 0.08 0.10 0.15                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
|                                                                                | Above 10 up to 25                                                | 0.1 0.13 0.20                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
|                                                                                | Sizes 30, 40, 50, 60, 70, 75, 80, 90, 100                        | 0.12 0.17 0.25<br>0.15 0.21 0.30<br>0.18 0.25 0.35                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
| Gauge blocks accessories                                                       | As BS 888 and BS 4311:Part 2                                     | 0.3                                                                                       | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |
| Length bar accessories                                                         | As BS 1790:1961 and BS 5317                                      | 0.3                                                                                       | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |
| Thread measuring cylinders                                                     | As BS 5590:1978 and specials                                     | 0.5                                                                                       | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |
| plain plug gauges (parallel), cylindrical standards and rollers                | From 1 up to 50 diameter<br>From 50 up to 150 diameter           | 0.8<br>1                                                                                  | } on diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |
| Plain ring gauges (parallel) and setting standards                             | From 1 up to 50<br>Above 50 up to 100                            | 1.5<br>2                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
| Steel balls - steel                                                            | Up to 50                                                         | 1                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |
| Plain gap gauges (parallel)                                                    | From 0.5 up to 100<br>Above 100 up to 200<br>Above 200 up to 300 | 3<br>5<br>8                                                                               | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |



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**Avon-Dynamic Calibration**  
**Issue No: 024 Issue date: 05 August 2008**

Calibration performed by the Organisation at the locations specified

| Measured Quantity<br>Instrument or Gauge                                        | Range                                           | Best<br>Measurement<br>Capability<br>Expressed as an<br>Expanded<br>Uncertainty ( $k=2$ )                                                   | Remarks                                                                                                                                                                                                                                                                                                                  | Location<br>Code |
|---------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES<br>UNLESS OTHERWISE STATED  |                                                 |                                                                                                                                             |                                                                                                                                                                                                                                                                                                                          |                  |
| LENGTH (Cont'd)                                                                 |                                                 |                                                                                                                                             | NOTES (Cont'd)                                                                                                                                                                                                                                                                                                           |                  |
| Screw plug gauges (parallel)<br>including check and setting<br>plugs See Note 5 | From 1 up to 100 diameter                       | 3 }<br>on pitch<br>diameter                                                                                                                 | 3 The uncertainty<br>quoted is for the departure<br>from either flatness,<br>straightness, parallelism<br>planes, which just enclose<br>the surface under<br>consideration.<br><br>4. Single start,<br>symmetrical thread forms<br>only.<br><br>5. Single start<br>symmetrical and<br>asymmetrical thread forms<br>only. | A                |
| Screw plug gauges (taper)<br>including check plugs<br>See Note 4                | From 1 up to 100 diameter                       | 4 }                                                                                                                                         |                                                                                                                                                                                                                                                                                                                          |                  |
| Screw ring gauges (parallel)<br>See Note 5                                      | From 1 up to 6 diameter                         | By check plugs                                                                                                                              |                                                                                                                                                                                                                                                                                                                          |                  |
|                                                                                 | From 6 up to 100 diameter                       | 5 }<br>on pitch<br>diameter                                                                                                                 |                                                                                                                                                                                                                                                                                                                          |                  |
| Screw ring gauges (taper)<br>See Note 4                                         | From 5 up to 50 diameter                        | By check plugs                                                                                                                              |                                                                                                                                                                                                                                                                                                                          |                  |
|                                                                                 | Form 10 to 150                                  | 7 on pitch diameter                                                                                                                         |                                                                                                                                                                                                                                                                                                                          |                  |
|                                                                                 |                                                 | Pitch: 1.0 flank angle:<br>$2 + (800/I(M \times P))$<br>Minutes of arc Where<br>$M$ is projector<br>magnification and $P$ is<br>pitch in mm |                                                                                                                                                                                                                                                                                                                          |                  |
| Screw thread adjustable caliper<br>gauges (parallel)<br>See Note 5              | From 3 up to 50 diameter                        | By setting plugs                                                                                                                            |                                                                                                                                                                                                                                                                                                                          | A                |
| Length gauges, flat and<br>spherical ended                                      | Up to 1 m                                       | $1 + (8 \times \text{length in m})$                                                                                                         |                                                                                                                                                                                                                                                                                                                          | A                |
| Engineers parallels                                                             | As BS 906:Part 1:1972 up to<br>50 x 100 x 400   | Dependant on size<br>and grade<br>From 1.5 up to 5                                                                                          |                                                                                                                                                                                                                                                                                                                          | A                |
| Vee blocks                                                                      | As BS 3731:1987 up to 150                       | Dependant on size<br>and grade.                                                                                                             |                                                                                                                                                                                                                                                                                                                          | A                |
| Receiver, position and profile<br>gauges, jigs and fixtures                     | Up to 1000 x 600 x 600                          | Minimum per co-<br>ordinate<br>$3 + (10 \times \text{length in m})$                                                                         |                                                                                                                                                                                                                                                                                                                          | A                |
| ANGLE                                                                           |                                                 |                                                                                                                                             |                                                                                                                                                                                                                                                                                                                          |                  |
| Squares                                                                         |                                                 |                                                                                                                                             |                                                                                                                                                                                                                                                                                                                          | A                |
| Blade type                                                                      | As BS 939:1977 up to 300<br>Above 300 up to 600 | 3 }<br>5 }                                                                                                                                  |                                                                                                                                                                                                                                                                                                                          | A                |
| Cylindrical                                                                     | As BS 939:1977 up to 300<br>Above 300 up to 600 | 2 }<br>5 }<br>On squareness<br>See note 3                                                                                                   |                                                                                                                                                                                                                                                                                                                          |                  |
| Block                                                                           | As BS 939:1977 up to 300<br>Above 300 up to 600 | 3 }<br>5 }                                                                                                                                  |                                                                                                                                                                                                                                                                                                                          |                  |



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| Measured Quantity<br>Instrument or Gauge                                       | Range                                                          | Best<br>Measurement<br>Capability<br>Expressed as an<br>Expanded<br>Uncertainty ( $k=2$ ) | Remarks | Location<br>Code |
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| RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES<br>UNLESS OTHERWISE STATED |                                                                |                                                                                           |         |                  |
| ANGLE (Cont'd)                                                                 |                                                                |                                                                                           |         |                  |
| Right angle and box angle plates                                               | As BS 5535:1978                                                | Squareness:<br>3 + (1 per 100 mm)<br>Parallelism:<br>1 + (1 per 100 mm)<br>See Note 3     |         | A                |
| Sine bars and tables                                                           | As BS 3064:1978 up to 250 length                               | Linear dimensions<br>1 + (10 x length in m)<br>Overall performance 3<br>seconds of arc    |         | A                |
| Electronic indicating levels                                                   | Up to 20 minutes of arc                                        | 1 % of range<br>Minimum 0.5 seconds<br>of arc                                             |         | A                |
| Spirit levels                                                                  | As BS 3509:1962 and BS<br>958:1968                             | Mean sensitivity<br>10% of nominal<br>Minimum 0.5 seconds<br>of arc                       |         | A                |
| Clinometers                                                                    | From 0 - 360 deg                                               | 10 seconds of arc or<br>greater<br>Dependant on<br>sensitivity                            |         | A                |
| Thread measuring vee pieces<br>(prisms)                                        | As NPL Schedule MOY/SCM1/60                                    | Within schedule<br>requirements                                                           |         | A                |
| FORM                                                                           |                                                                |                                                                                           |         |                  |
| Surface plates<br>Granite<br>Cast iron                                         | As BS 817:1988 and above<br>up to 1600 x 1000                  | 1.5 + (0.8 x diagonal<br>in m)<br>See note 3                                              |         | A                |
| Straightedges<br>Cast iron<br>Steel<br>Granite                                 | As BS 5204:Part 1:1975<br>As BS 5204:Part 2:1977 Up to<br>1800 | 1 + (2 x length in m)<br>See note 3                                                       |         | A                |



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| RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES<br>UNLESS OTHERWISE STATED |                                                     |                                                                                           |         |                  |
| MEASURING INSTRUMENTS AND MACHINES                                             |                                                     |                                                                                           |         |                  |
| Micrometers<br>External<br>Internal<br>Depth                                   | As BS 870:1959<br>As BS 959:1959<br>As BS 6468:1984 | Heads: 2.0<br>Setting and<br>extension rods<br>$1 + (8 \times \text{length in m})$        |         | A                |
| Micrometer heads                                                               | As BS 1734:1951                                     |                                                                                           | 1.0     | A                |
| Bore micrometers (three point)                                                 | Up to 150 diameter                                  | 5.0                                                                                       |         | A                |
| Bench micrometers                                                              |                                                     | Overall performance<br>2.0                                                                |         | A                |
| Height setting micrometer                                                      | Up to 300                                           | Heads:1.2<br>Stepped column 2<br>Overall performance<br>2.5                               |         | A                |
| Riser blocks for above                                                         | 150<br>300                                          | 1.0<br>2.0                                                                                |         | A                |
| Vernier caliper, height and<br>depth gauges                                    | As BS 887:1982 and<br>BS 1643:1983                  | Overall performance<br>$10 + (30 \times \text{length in m})$                              |         | A                |
| Comparators (external)                                                         | As BS 1054:1975 up to<br>10 000 magnifications      | 1% of range<br>Minimum 0.2                                                                |         | A                |
| Dial gauges and dial test<br>indicators                                        | As BS 907:1965 and BS<br>2795:1981                  | 1.0                                                                                       |         | A                |
| Bevel protractors                                                              | As BS 1685:1959                                     | 1 minute of arc + 1<br>vernier division                                                   |         | A                |
| Thread diameter measuring                                                      | Up to 200 capacity                                  | Dependant on quality<br>and overall<br>performance                                        |         | A                |
| Steel Rules                                                                    | As BS 4372:1968<br>Up to 1000                       | $15 + (20 \times \text{length in m})$                                                     |         | A                |
| Feeler Gauges                                                                  | As BS 975:Part 1:1941<br>BS 957:Part 2:1969         | 3                                                                                         |         | A                |
| Electronic Height Gauges with<br>microprocessor control                        | Up to 1m                                            | $1 + (8 \times \text{length in m})$                                                       |         | A, B             |



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| RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES<br>UNLESS OTHERWISE STATED |                         |                                                                                           |         |                  |
| MEASURING INSTRUMENTS AND MACHINES (Cont'd)                                    |                         |                                                                                           |         |                  |
| Surface plates<br>Granite<br>Cast iron                                         | As BS 817:1988          | 1.5 + (0.8 x length in<br>m)                                                              |         | A, B             |
| Coordinate measuring<br>machines                                               | As ISO 10360-2          | 1 + (3 x length in m)                                                                     |         | B                |
| Profile projectors                                                             | Up to 100 magnification | 125 at the screen<br>Linear 5<br>Angular 3 minutes of<br>arc                              |         | B                |
| END                                                                            |                         |                                                                                           |         |                  |