


# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

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

 <p><b>0785</b></p> <p>Accredited to ISO/IEC 17025:2005</p>	<p><b>Trescal EMS</b> A trading division of Trescal Ltd</p> <p>Issue No: 015      Issue date: 30 March 2012</p>	
	<p>Leigh Commerce Park Greenfold Way Leigh Greater Manchester WN7 3XJ</p>	<p>Contact: Mr C Miller, Mr D Moore, Ms Luisa Ward Tel: + 44 (0)125 253 3334 E-Mail: <a href="mailto:chris.miller@trescal.com">chris.miller@trescal.com</a> Website: <a href="http://www.trescal.com">www.trescal.com</a></p>
<p>Calibration performed by the Organisations at the locations specified below</p>		

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

#### Laboratory locations:

Location details	Activity	Location code
<p><b>Address</b> Goodrich Actuation Systems Stafford Road Ford Houses Wolverhampton West Midlands WV10 7EH</p> <p><b>Local contact</b> Chris Miller or Dave Moore  Tel +44 (0) 1902 624 644 Fax +44 (0) 1902 624 463 Email: <a href="mailto:chris.miller@trescal.com">chris.miller@trescal.com</a></p>	<p>Capabilities: Electrical DC and LF Dimensional</p>	Ford Houses
<p><b>Address</b> Goodrich Actuation Systems Wilson Road Stretton Way Huyton Liverpool L36 6JE</p> <p><b>Local contact</b> Roy Kelley or Chris Miller  Tel +44 (0) 151 481 4317 Fax +44 (0) 151 481 4317 Email: <a href="mailto:roy.kelley@goodrich.com">roy.kelley@goodrich.com</a></p>	<p>Capabilities: Dimensional</p>	Huyton
<p><b>Address</b> <b>Aero Engine Controls</b> York Road Hall Green Birmingham B28 9LN</p> <p><b>Local contact</b> John Loose  Tel +44 (0) 121 627 6600 Fax +44 (0) 121 778 5575 Email:</p>	<p>Capabilities: Electrical DC and LF</p>	York Road
<p><b>Address</b> <b>Aero Engine Controls</b> Standards/ Calibration Room Goodrich E.C.S. Shaftmoor Lane Hall Green Birmingham B28 8SW</p> <p><b>Local contact</b> Jim Attwooll  Tel +44 (0) 121 706 7395 / +44 (0) 121 707 7111 Ext 5809 Fax +44 (0) 121 707 8826 Email:</p>	<p>SUPPORT Location Handling of Calibration and Test items only.</p>	Shaftmoor



0785

Accredited to  
ISO/IEC 17025:2005

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Trescal EMS**  
**A trading division of Trescal Ltd**

**Issue No:** 015    **Issue date:** 30 March 2012

**Calibration performed by the Organisation at the locations specified**

<b>Address</b> <b>Airbus Broughton</b> Hanger 78 - gauge room Chester Road Broughton CH4 0DR	<b>Local contact</b> Les Cooke  Tel +44 (0) 1244 523920 Fax +44 (0) 1244 524189 Email:	<b>Capabilities:</b> Dimensional	Airbus Broughton
<b>Address</b> <b>Cummins Engines</b> Yarm Road Darlington DL1 4PW	<b>Local contact</b> Steve Urwin  Tel +44 (0) 1325 556382 Fax: Email:	<b>Capabilities:</b> Dimensional	Cummins Darlington

**Site activities performed away from the locations listed overleaf:**

Location details	Activity	Location code
The customers' site or premises must be suitable for the nature of the particular calibrations undertaken and will be the subject of contract review arrangements between the laboratory and the customer.  <b>Contacts:</b> Kyle Angus, Roy Kelley, Les Cooke and Chris Miller  Tel +44 (0) 151 481 4317 Fax +44 (0) 151 481 4317 Email: Roy.Kelley@goodrich.com	Surface plates and tables Electronic height gauges	Huyton Site



0785

Accredited to  
ISO/IEC 17025:2005

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Trescal EMS**  
**A trading division of Trescal Ltd**

**Issue No: 015 Issue date: 30 March 2012**

Calibration performed by the Organisation at the locations specified

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k = 2$ )	Remarks	Location Code
<b>ELECTRICAL MEASUREMENTS</b>				Ford Houses and York Road
DC RESISTANCE	0 $\Omega$ to 1 $\Omega$ 1 $\Omega$ to 20 $\Omega$ 20 $\Omega$ to 200 $\Omega$ 200 $\Omega$ to 2 k $\Omega$ 2 k $\Omega$ to 20 k $\Omega$ 20 k $\Omega$ to 200 k $\Omega$ 200 k $\Omega$ to 2 M $\Omega$ 2 M $\Omega$ to 20 M $\Omega$ 20 M $\Omega$ to 200 M $\Omega$ 200 M $\Omega$ to 1 G $\Omega$	30 $\mu\Omega$ 24 ppm 16 ppm 17 ppm 17 ppm 17 ppm 29 ppm 62 ppm 660 ppm 1.3 %		
DC VOLTAGE	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1 kV	9.5 ppm + 0.34 $\mu$ V 6.8 ppm 4.5 ppm 8.5 ppm 12 ppm		
DC CURRENT	0 $\mu$ A to 10 $\mu$ A 10 $\mu$ A to 200 $\mu$ A 200 $\mu$ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A  2 A to 10 A 10 A to 100 A	1.2 nA 120 ppm 91 ppm 91 ppm 91 ppm 100 ppm  0.060 % 0.14 %		Ford Houses only
AC VOLTAGE	10 mV to 200 mV 40 Hz to 10 kHz 200 mV to 2 V 40 Hz to 10 kHz 2 V to 20 V 40 Hz to 10 kHz 20 V to 200 V 40 Hz to 10 kHz 200 V to 1 kV 60 Hz to 10 kHz	240 ppm  210 ppm  200 ppm  280 ppm  520 ppm		Ford Houses and York Road



0785

Accredited to  
ISO/IEC 17025:2005

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Trescal EMS**  
**A trading division of Trescal Ltd**

**Issue No: 015 Issue date: 30 March 2012**

**Calibration performed by the Organisation at the locations specified**

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k = 2$ )	Remarks	Location Code
AC CURRENT	10 $\mu$ A to 200 $\mu$ A 60 Hz to 1 kHz	0.17 %		Ford Houses and York Road
	200 $\mu$ A to 2 mA 60 Hz to 1 kHz	0.17 %		
	2 mA to 20 mA 60 Hz to 1 kHz	0.17 %		
	20 mA to 200 mA 60 Hz to 1 kHz	0.17 %		
DC CONDUCTANCE	200 mA to 2 A 60 Hz to 1 kHz	0.29 %		
	10 mS to 10 nS	1.0 %		
CAPACITANCE	10 $\mu$ F to 1 mF 100 Hz	1.5 %		
	10 pF to 1 $\mu$ F 1 kHz	0.060 %		
	100 pF to 1 $\mu$ F 10 kHz	0.080 %		
INDUCTANCE	10 $\mu$ H to 100 $\mu$ H 1 kHz	0.50 %		
	100 $\mu$ H to 10 H 1 kHz	0.10 %		
RISE TIME	Fast edge	1.0 ns	Up to 1 V into 50 $\Omega$	
BANDWIDTH				
3 dB points	1 MHz to 250 MHz	50 kHz	At a nominal 1 volt, suitable for Oscilloscope calibration. 3 dB set points to $\pm 0.2$ dB are included in the overall uncertainty which will be quoted in Hertz terms.	
FREQUENCY	0.1 Hz to 1 Hz 1 Hz to 100 Hz 100 Hz to 1 kHz	35 $\mu$ Hz 3.5 ppm 0.70 ppm	May be reported as time (1/f) for repetitive signals	
	1 kHz to 10 kHz 10 kHz to 10 MHz	8.0 parts in $10^8$ 2.0 parts in $10^8$		
ELAPSED TIME	0 s to 24 hours	15 $\mu$ s	For electronically triggered events, manually triggered devices may be calibrated but at increased uncertainties.	



0785

Accredited to  
ISO/IEC 17025:2005

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Trescal EMS**  
**A trading division of Trescal Ltd**

**Issue No: 015 Issue date: 30 March 2012**

**Calibration performed by the Organisation at the locations specified**

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k = 2$ )	Remarks	Location Code
<b>DIMENSIONAL MEASUREMENTS</b>				
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH			NOTES	Ford Houses
			1. In addition to the items listed above, other similar items, including parts of measuring instruments and machines, may be calibrated to the uncertainties stated. Where the item or part calibrated is of lower quality due to wear, errors in geometry or form, or poor surface texture, or where any other factor adversely affects the measurement capability, greater uncertainties must be quoted.	
			2. The uncertainty quoted if for the departure from flatness, straightness, or squareness, i.e. the distance separating the two parallel planes, which just enclose the surface under consideration.	
			3. Single start, symmetrical thread forms only.	
Precision scales (linear)	0 to 400	1.5 + (3.0 x length in m)		Huyton
Plain plug gauges (parallel) cylindrical setting standards and rollers	1 to 50 diameter	0.80		Ford
	50 to 100	1.0		Houses and
	100 to 150	1.2		Huyton
Plain ring gauges (parallel)	6 to 50 diameter	1.0		Ford
	50 to 100	1.6		Houses and
	100 to 150	2.0		Huyton
Plain gap gauges (parallel)	2 to 25	3.0		Ford
	25 to 100	5.0		Houses and
	100 to 150	8.0		Huyton



0785

Accredited to  
ISO/IEC 17025:2005

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Trescal EMS**  
**A trading division of Trescal Ltd**

**Issue No: 015 Issue date: 30 March 2012**

**Calibration performed by the Organisation at the locations specified**

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				
Screw plug gauges (parallel) including check and setting plugs See Note 3	3 to 100 diameter	3.0 on pitch diameter		Huyton
Screw ring gauges (parallel) See Note 3	6 to 100 diameters	5.0 on pitch diameter		Huyton
Pitch: 1.5 Flank angle: $2.0 + ((800/MxP))$ Minutes of arc Where $M$ is the projector magnification and $P$ is pitch in mm				
Parallels	As BS 906:1972	Dependent on size and grade 1.5 to 5.0		Ford Houses and Huyton
Vee blocks	As BS 3731:1987	Dependent on size and grade 2.5 to 5.0		Huyton
ANGLE				
Squares Blade type	As BS 939:2007 up to 300 300 up to 600	3.0 on squareness 5.0 See note 2		Huyton
Angle plates and box angle plates	As BS 5535:1978	Squareness: $3.0 + (1.0 \text{ per } 100 \text{ mm})$ Parallelism: $1.0 + (1.0 \text{ per } 100 \text{ mm})$ See Note 2		Huyton
Sine bars and tables	As BS 3064:1978 and up to 500 length	Linear dimensions: $1.0 + (10 \times \text{length in m})$ Overall performance: 5.0 seconds of arc		Huyton
FORM				
Surface plates				Huyton
Granite	As BS 817:2008	1.5 + $(0.80 \times \text{diagonal in m})$		
Cast iron		See Note 2		
Roundness	As BS 3730:1982			Huyton and Fordhouses
External	0 to 350 diameter	0.050 on radius		
Internal	3 to 350 diameter	0.050 on radius		



0785

Accredited to  
ISO/IEC 17025:2005

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Trescal EMS**  
**A trading division of Trescal Ltd**

**Issue No: 015 Issue date: 30 March 2012**

**Calibration performed by the Organisation at the locations specified**

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				
Straightedges				Huyton
Cast Iron	As BS 5204:1975:Part 1	1.0 + (2 x length in m) See Note 2		
Steel	As BS 5204:1977:Part 2			
Granite	As BS 5204:1977:Part 2			
<b>MEASURING INSTRUMENTS AND MACHINES</b>				
Micrometers				
External	As BS 870:2008 and above	Heads: 2.0 between any two points Setting and extension rods: 0.60 + 3.0 x length in m		Ford Houses, Airbus and Huyton
Internal	As BS 959:2008			
Depth	As BS 6468:2008			
Bore micrometers (3 point)	0 mm to 100mm	Overall performance 5.0		Ford Houses, Airbus and Huyton
Micrometer heads	As BS 1734:1951	1.0		Huyton
Bench micrometer		Overall performance 2.0		Huyton
Height setting micrometer	0 to 300	Heads: 1.5 between any two points stepped column 2.5 Overall performance: 3.0		Ford Houses and Huyton
Riser blocks for above	150 300	2.5 5.0		Ford Houses and Huyton
Electronic height gauges	1 to 600	1.0 + (5.0 x length in m)		Huyton
Vernier gauges				
Caliper	As BS 887:2008	Overall performance: 10 + (30 x length in m)		Ford Houses, Airbus and Huyton
Height	As BS 1643:2008			
Depth	As BS 6365:2008			
Dial gauges and dial test indicators	As BS 907:2008 and BS 2795:1981	1.0		Ford Houses, Airbus and Huyton
Spirit levels	BS 958:1968 and BS 3509:1962	Mean sensitivity: 10 % of nominal Minimum 0.50 seconds of arc		Huyton



0785

Accredited to  
ISO/IEC 17025:2005

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Trescal EMS**  
**A trading division of Trescal Ltd**

**Issue No: 015    Issue date: 30 March 2012**

**Calibration performed by the Organisation at the locations specified**

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				
Bevel protractors	As BS 1685:2008	1.0 min of arc + 1.0 vernier division		Ford Houses and Huyton
Steel rules	0 m to 1m	15 + (20 x length in metres)		Huyton
FORM			NOTES 1. 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.	Huyton
Surface Plates				
Granite Cast iron	As BS 817:2008	1.5 + (0.8 x diagonal in m) See Note 1		
Electronic height gauges	1 mm to 600mm	1.0 + (5.0 x length in m)		
END				