

# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

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

 <p><b>UKAS</b> CALIBRATION <b>0590</b></p> <p>Accredited to <b>ISO/IEC 17025:2005</b></p>	<h3>EffectTech</h3> <p><b>Issue No:</b> 030    <b>Issue date:</b> 25 January 2012</p>	
	<p><b>Dove House</b> <b>Dove Fields</b> <b>Uttoxeter</b> <b>Staffordshire</b> <b>ST14 8HU</b></p>	<p><b>Contact: Dr Gavin Squire</b> <b>Tel: +44 (0)1889 569229</b> <b>Fax: +44 (0)1889 569220</b> <b>E-Mail: gavin.squire@effectech.co.uk</b> <b>Website: www.effectech.co.uk</b></p>
<p><b>Calibration performed by the Organisations at the locations specified below</b></p>		

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

#### Laboratory locations:

Location details	Activity	Location code
<p><b>Address</b> EffectTech Limited Dove House Dove Fields Uttoxeter Staffordshire ST14 8HU</p> <p><b>Local contact</b> Dr Gavin Squire  Tel: +44 (0)1889 569229 Fax: +44 (0)1889 569220 email: gavin.squire@effectech.co.uk</p>	<p>Gas Calibration Process Gas Analysers Pressure Transmitters Temperature Transmitters by Electrical Simulation</p>	Uttoxeter
<p><b>Address</b> EffectTech Gases Pvt Ltd N-163 MIDC Tarapur Boisar District Thane - 401506 Maharashtra India</p> <p><b>Local contact</b> Padmakar Tillu  Tel: +91 (0)2525 276137 Fax: +91 (0)2525 276827 email: padmakar.tillu@effectech.co.in</p>	<p>Gas Calibration</p>	Tarapur

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

Location details	Activity	Location code
<p>Any Suitable Customer Premises</p>	<p>Process Gas Analysers Pressure Transmitters Temperature Transmitters by Electrical Simulation</p>	Site



0590  
Accredited to  
ISO/IEC 17025:2005

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

**Effectech**

**Issue No:** 030    **Issue date:** 25 January 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
GAS MIXTURES	amount fraction (%mol/mol)	amount fraction (%mol/mol)	<b>In-house method TM001</b>	Uttoxeter
nitrogen	0.1 to 22	0.3 % relative + 0.002	Calibration of gas mixtures in accordance with ISO 6143:2001 using gas chromatography with thermal conductivity detection (TCD)	
carbon dioxide	0.05 to 15	0.35 % relative + 0.001		
methane	34 to 100	0.07		
ethane	0.1 to 35	0.3 % relative + 0.001		
propane	0.05 to 15	0.6 % relative + 0.002		
iso-butane	0.01 to 0.15 0.15 to 2	0.0012 0.8 % relative		
n-butane	0.01 to 0.15 0.15 to 2	0.0012 0.8 % relative		
neo-pentane	0.005 to 0.35	1.5 % relative + 0.0002		
iso-pentane	0.005 to 0.1 0.1 to 0.35	0.0008 0.8 % relative		
n-pentane	0.005 to 0.1 0.1 to 0.35	0.0008 0.8 % relative		
n-hexane	0.1 to 0.35	1.0 % relative	Calibration of gas mixtures using gas chromatography with flame ionisation detection (FID)	
n-hexane	0.001 to 0.1	1.0 % relative + 0.0001		
2-methylpentane	0.001 to 0.35	1.3 % relative + 0.00005		
3-methylpentane	0.001 to 0.35	1.3 % relative + 0.00005		
2,2-dimethylbutane	0.001 to 0.35	1.3 % relative + 0.00005		
benzene	0.001 to 0.2	1.3 % relative + 0.00005		
cyclohexane	0.001 to 0.2	1.3 % relative + 0.00005		
n-heptane	0.001 to 0.2	1.3 % relative + 0.00005		
toluene	0.001 to 0.1	1.3 % relative + 0.00005		
methylcyclohexane	0.001 to 0.1	1.3 % relative + 0.00005		
n-octane	0.0005 to 0.05	1.3 % relative + 0.00005		
n-nonane	0.0005 to 0.02	1.3 % relative + 0.00005		
n-decane	0.0005 to 0.005	1.3 % relative + 0.00005		



0590  
Accredited to  
ISO/IEC 17025:2005

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

**EffectTech**

**Issue No: 030 Issue date: 25 January 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	
GAS MIXTURES (cont'd)	amount fraction (%mol/mol)	amount fraction (%mol/mol)	<b>In-house method TM001</b> (cont'd)	Uttoxeter	
C <sub>6+</sub>	0.001 to 0.10 0.10 to 0.35	1.0 % relative + 0.0001 1.0 % relative	C <sub>6+</sub> is the sum of all hydrocarbons containing six carbon atoms or greater		
oxygen	0.005 to 1	5.0 % relative	Calibration of gas mixtures using gas chromatography with thermal conductivity detection (TCD)		
helium	0.005 to 0.2	1.7 % relative + 0.0004			
hydrogen	0.005 to 0.2	1.7 % relative + 0.0002			
			<b>In-house method TM005</b>	Tarapur	
nitrogen	0.1 to 12	0.3 % relative + 0.002	Calibration of gas mixtures in accordance with ISO 6143:2001 using gas chromatography with thermal conductivity detection (TCD)		
carbon dioxide	0.05 to 8	0.35 % relative + 0.002			
methane	64 to 100	0.07			
ethane	0.1 to 14	0.4 % relative + 0.005			
propane	0.05 to 8	0.8 % relative			
iso-butane	0.01 to 0.15 0.15 to 1.2	0.0012 0.8 % relative			
n-butane	0.01 to 1.2	0.8 % relative + 0.001			
neo-pentane	0.005 to 0.35	1.7 % relative + 0.001			
iso-pentane	0.005 to 0.1 0.1 to 0.35	0.001 0.9 % relative			
n-pentane	0.005 to 0.1 0.1 to 0.35	0.001 0.9 % relative			
n-hexane	0.1 to 0.35	1.0 % relative			
n-hexane	0.001 to 0.1	1.0 % relative + 0.0001		Calibration of gas mixtures using gas chromatography with flame ionisation detection (FID)	
2-methylpentane	0.001 to 0.35	1.5 % relative + 0.0001			
3-methylpentane	0.001 to 0.35	1.5 % relative + 0.0001			
2,2-dimethylbutane	0.001 to 0.35	1.5 % relative + 0.0001			
benzene	0.001 to 0.2	1.5 % relative + 0.0001			
cyclohexane	0.001 to 0.2	1.5 % relative + 0.0001			
n-heptane	0.001 to 0.2	1.5 % relative + 0.0001			
toluene	0.001 to 0.1	1.5 % relative + 0.0001			



0590  
Accredited to  
ISO/IEC 17025:2005

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

**EffecTech**

**Issue No: 030 Issue date: 25 January 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
GAS MIXTURES (cont'd)	amount fraction (%mol/mol)	amount fraction (%mol/mol)	<b>In-house method TM005</b> (cont'd)	Tarapur
methylcyclohexane	0.001 to 0.1	1.5 % relative + 0.0001		
n-octane	0.0005 to 0.05	1.5 % relative + 0.0001		
n-nonane	0.0005 to 0.02	1.5 % relative + 0.0001		
n-decane	0.0005 to 0.005	1.5 % relative + 0.0001		
oxygen	0.005 to 1	5.0 % relative	Calibration of gas mixtures using gas chromatography with thermal conductivity detection (TCD)	
Calculated values for:	Calculations valid for gas mixtures with amount fractions (%mol/mol)		Calculated values according to ISO 6976:1995 including amendment No 1, May 1998	Uttoxeter & Tarapur
calorific value (superior)	nitrogen < 30 %	0.1 % relative		
calorific value (inferior)	carbon dioxide < 15 %	0.1 % relative		
relative density	ethane < 15 %	0.1 % relative		
density	other components < 5 %	0.1 % relative		
Wobbe index	methane no restriction	0.1 % relative		
mean molecular mass		0.1 % relative		
compression factor		0.1 % relative		
GAS MIXTURES (cont'd)	amount fraction (ppm mol/mol)	amount fraction (ppm mol/mol)	<b>In-house method TM002</b>	Uttoxeter
hydrogen sulphide	0.2 to 10	2 % relative + 0.03	<b>Sulphur and odourant gas mixtures</b>	
carbonyl sulphide	0.2 to 10	2 % relative + 0.03	Calibration of gas mixtures using gas chromatography with sulphur chemiluminescence detection (SCD)	
methanethiol (methyl mercaptan)	0.2 to 10	2 % relative + 0.03		
ethanethiol (ethyl mercaptan)	0.2 to 10	2 % relative + 0.03		
dimethyl sulphide	0.2 to 10	2 % relative + 0.03		
2-propanethiol (iso-propyl mercaptan)	0.2 to 10	2 % relative + 0.03		
ethyl methyl sulphide (methyl ethyl sulphide)	0.2 to 10	2 % relative + 0.03		
2-methyl-2-propanethiol (tert-butyl mercaptan)	0.2 to 10	2 % relative + 0.03		
diethyl sulphide	0.2 to 10	2 % relative + 0.03		
tetrahydrothiophene (THT)	0.2 to 10	2 % relative + 0.03		



0590  
Accredited to  
ISO/IEC 17025:2005

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

**EffectTech**

**Issue No:** 030    **Issue date:** 25 January 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
GAS MIXTURES (cont'd)	amount fraction (%mol/mol)	amount fraction (%mol/mol)	<b>In-house method TM004</b>	Uttoxeter
nitrogen	40 to 50	1 % relative	<b>Blast furnace gas mixtures</b> Calibration of gas mixtures in accordance with ISO6143:2001 using gas chromatography with thermal conductivity detection (TCD)	
carbon dioxide	20 to 30	1 % relative		
hydrogen	1 to 8	1 % relative		
carbon monoxide	20 to 30	1 % relative		
nitrogen	0.1 to 10	0.25 % relative + 0.005	<b>In-house method TM012</b>  <b>Refinery gas mixtures</b> Calibration of gas mixtures in accordance with ISO6143:2001 using gas chromatography with thermal conductivity (TCD) and flame ionisation detection (FID)	Uttoxeter
carbon dioxide	0.1 to 3	0.7 % relative		
hydrogen	10 to 40 40 to 70	0.3 % relative + 0.03 0.15		
carbon monoxide	0.1 to 8	0.25 % relative + 0.0075		
methane	10 to 65	0.08		
ethane	0.5 to 28	0.25 % relative + 0.01		
ethene	0.5 to 12	0.6 % relative + 0.005		
propane	0.1 to 2.5 2.5 to 10	0.02 0.4 % relative + 0.01		
propene	0.1 to 5	0.5 % relative + 0.002		
nitrogen	0.1 to 3	0.45 % relative + 0.005		
ethane	0.25 to 3	0.60 % relative +0.002		
propane	92 to 99.5	0.10 % relative		
iso-butane	0.03 to 1	2.0 % relative		
n-butane	0.03 to 1	2.0 % relative		
iso-pentane	0.02 to 0.08	4.0 % relative		
n-pentane	0.02 to 0.08	4.0 % relative		



0590  
Accredited to  
ISO/IEC 17025:2005

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

**EffectTech**

**Issue No:** 030    **Issue date:** 25 January 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
GAS ANALYSERS	amount fraction (%mol/mol)	amount fraction (%mol/mol)	<b>In-house method TM003</b>	Uttoxeter or site
nitrogen	0.1 to 22	0.7 % relative + 0.005	Calibration of gas chromatographs used for natural gas analysis based on ISO 10723	
carbon dioxide	0.05 to 15	0.8 % relative + 0.002		
methane	34 to 100	0.1 % relative		
ethane	0.1 to 23	1.0 % relative		
propane	0.05 to 10	1.2 % relative		
iso-butane	0.01 to 2.0	1.6 % relative		
n-butane	0.01 to 2.0	1.6 % relative		
neo-pentane	0.005 to 0.35	2.8 % relative + 0.0015		
iso-pentane	0.005 to 0.35	1.5 % relative + 0.0015		
n-pentane	0.005 to 0.35	1.5 % relative + 0.0015		
n-hexane	0.005 to 0.35	1.8 % relative		
n-heptane	0.005 to 0.10	2.5 % relative		
			<b>In-house method TM006</b>	Uttoxeter or site
C <sub>1</sub> - C <sub>3</sub>	0.0008 to 100	amount fractions from 1 % to 100 % ± 0.5 % relative	Calibration of process gas analysers based on ISO 10723	
C <sub>4</sub>	0.001 to 50			
C <sub>5</sub>	0.001 to 9	amount fractions from 0.1% to 1% ± 1 % relative		
C <sub>6</sub>	0.001 to 1.5			
C <sub>7</sub>	0.001 to 0.5	amount fractions from 0.0008% to 0.1% ± 2 % relative		
C <sub>8</sub>	0.001 to 0.2			
C <sub>9</sub>	0.001 to 0.2			
C <sub>10</sub>	0.001 to 0.05			
benzene	0.001 to 1			
toluene	0.001 to 0.4			
xylenes (m, p & o)	0.001 to 0.1			
argon	0.1 to 100			



0590  
Accredited to  
ISO/IEC 17025:2005

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

**EffectTech**

**Issue No: 030 Issue date: 25 January 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
GAS ANALYSERS (cont'd)	amount fraction (%mol/mol)	amount fraction (%mol/mol)	<b>In-house method TM006</b> (cont'd)	Uttoxeter or site
carbon dioxide	0.03 to 100	amount fractions from 1 % to 100 %		
carbon monoxide	0.001 to 100	$\pm 0.5$ % relative		
helium	0.1 to 100	amount fractions from 0.1 % to 1 %		
hydrogen	0.08 to 100	$\pm 1$ % relative		
nitrogen	0.1 to 100	amount fractions from 0.0008 % to 0.1 %		
oxygen	0.05 to 100	$\pm 2$ % relative		
hydrogen sulphide	amount fraction (ppm mol/mol) 1 to 10	amount fraction (ppm mol/mol) 2 % relative + 0.03	<b>In-house method TM011</b>  Transmitters with an electrical output can be calibrated	Site
<b>PRESSURE</b>				
Differential pressure transmitters	2.0 kPa to 5.0 kPa 5.0 kPa to 50 kPa 50 kPa to 200 kPa	3.1 Pa 0.017 % relative + 2.3 Pa 0.024 % relative		
Static pressure transmitters	500 kPa to 10 MPa	0.026 % relative		
Absolute pressure transmitters	600 kPa to 10 MPa	0.026 % relative	<b>In-house method TM013</b>  Transmitters with an electrical output can be calibrated	Site
<b>ELECTRICAL</b>				
Temperature indicators and transmitters, calibration by electrical simulation for the following sensor type				
Pt100 probes	- 10 °C to + 100 °C	0.075 °C		

END