



0590
Accredited to
ISO/IEC 17025:2005

Schedule of Accreditation
issued by
United Kingdom Accreditation Service
2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

EffecTech Limited
Issue No: 042 Issue date: 19 February 2016

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	
SECONDARY REFERENCE GAS MIXTURES (SRGM) Calibration of synthetic gas mixture by analysis					
SYNTHETIC NATURAL GAS MIXTURES	amount fraction (% mol/mol)	amount fraction (% mol/mol)	In-house method TM001/UT	Uttoxeter	
nitrogen	0.1 to 22	0.25 % relative + 0.0005	Calibration of gas mixtures in accordance with ISO 6143:2001 using gas chromatography with thermal conductivity detection (TCD)		
carbon dioxide	0.05 to 15	0.18 % relative + 0.0001			
methane	34 to 100	0.11 % mol/mol - 0.10 % relative			
ethane	0.1 to 35	0.25 % relative			
propane	0.05 to 15	0.3 % relative			
iso-butane	0.01 to 0.15 0.15 to 2	0.00045 0.3 % relative			
n-butane	0.01 to 0.15 0.15 to 2	0.00045 0.3 % relative			
neo-pentane	0.002 to 0.35	0.7 % relative + 0.0001			
iso-pentane	0.005 to 0.35	0.5 % relative + 0.0001			
n-pentane	0.005 to 0.35	0.5 % relative + 0.0001			
n-hexane	0.001 to 0.35	1.0 % relative + 0.0001			Calibration of gas mixtures using gas chromatography with flame ionisation detection (FID)
2-methylpentane	0.001 to 0.35	1.3 % 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			
C ₆ +	0.001 to 0.35	1.0 % relative + 0.0001	C ₆ + is the sum of all hydrocarbons containing six carbon atoms or greater		



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SECONDARY REFERENCE GAS MIXTURES (SRGM) (continued)					
SYNTHETIC NATURAL GAS MIXTURES (continued)	amount fraction (% mol/mol)	amount fraction (% mol/mol)	In-house method TM001/UT (continued)	Uttoxeter	
oxygen	0.005 to 1	5 % 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			
nitrogen	0.1 to 12	0.25 % relative + 0.0005	In-house method TM005/TA Calibration of gas mixtures in accordance with ISO 6143:2001 using gas chromatography with thermal conductivity detection (TCD)		Tarapur
carbon dioxide	0.05 to 8	0.18 % relative + 0.0001			
methane	64 to 100	0.11 % mol/mol - 0.10 % relative			
ethane	0.1 to 14	0.25 % relative			
propane	0.05 to 8	0.3 % relative			
iso-butane	0.01 to 0.15 0.15 to 1.2	0.00045 0.3 % relative			
n-butane	0.01 to 0.15 0.15 to 1.2	0.00045 0.3 % relative			
neo-pentane	0.002 to 0.35	0.7 % relative + 0.0001			
iso-pentane	0.005 to 0.35	0.5 % relative + 0.0001			
n-pentane	0.005 to 0.35	0.5 % relative + 0.0001		Calibration of gas mixtures using gas chromatography with flame ionisation detection (FID)	
n-hexane	0.001 to 0.35	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			



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SECONDARY REFERENCE GAS MIXTURES (SRGM) (continued)					
SYNTHETIC NATURAL GAS MIXTURES (continued)	amount fraction (% mol/mol)	amount fraction (% mol/mol)	In-house method TM005/TA (continued)	Tarapur	
n-nonane	0.0005 to 0.02	1.3 % relative + 0.00005	Calibration of gas mixtures using gas chromatography with thermal conductivity detection (TCD)		
n-decane	0.0005 to 0.005	1.3 % relative + 0.00005			
oxygen	0.005 to 1	5 % relative			
nitrogen	0.1 to 12	0.35 % relative + 0.0005	In-house method TM022/QA	Qatar	
carbon dioxide	0.05 to 8	0.20 % relative + 0.0005	Calibration of gas mixtures in accordance with ISO 6143:2001 using gas chromatography with thermal conductivity detection (TCD)		
methane	64 to 100	0.11 – 0.1 % relative			
ethane	0.1 to 14	0.25 % relative			
propane	0.05 to 8	0.30 % relative			
iso-butane	0.01 to 0.15 0.15 to 1.2	0.0005 0.35 % relative			
n-butane	0.01 to 0.15 0.15 to 1.2	0.0005 0.35 % relative			
neo-pentane	0.004 to 0.35	0.70 % relative + 0.0001			
iso-pentane	0.005 to 0.1 0.1 to 0.35	0.0010 0.9 % relative + 0.0006			
n-pentane	0.005 to 0.18 0.18 to 0.35	0.001 0.9 % relative + 0.0006			
n-hexane	0.1 to 0.35	1.2 % relative			
n-hexane	0.001 to 0.1	1.7 % relative + 0.00005			Calibration of gas mixtures using gas chromatography with flame ionisation detection (FID)
2-methylpentane	0.001 to 0.35	1.7 % relative + 0.00005			
3-methylpentane	0.001 to 0.35	1.7 % relative + 0.00005			
2,2-dimethylbutane	0.001 to 0.35	1.7 % relative + 0.00005			
benzene	0.001 to 0.2	1.7 % relative + 0.00005			
cyclohexane	0.001 to 0.2	1.7 % relative + 0.00005			
n-heptane	0.001 to 0.2	1.7 % relative + 0.00005			
toluene	0.001 to 0.1	1.7 % relative + 0.00005			
methylcyclohexane	0.001 to 0.1	1.7 % relative + 0.00005			



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SECONDARY REFERENCE GAS MIXTURES (SRGM) (continued)				
SYNTHETIC NATURAL GAS MIXTURES (continued)	amount fraction (% mol/mol)	amount fraction (% mol/mol)	In-house method TM022/QA (continued)	Qatar
n-octane	0.0005 to 0.05	1.7 % relative + 0.00005		
n-nonane	0.0005 to 0.02	1.7 % relative + 0.00005		All Sites
n-decane	0.0005 to 0.005	1.7 % relative + 0.00005		
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	
calorific value (superior)		0.1 % relative		
calorific value (inferior)	nitrogen < 30 %	0.1 % relative		
relative density	carbon dioxide < 15 %	0.1 % relative		
density	ethane < 15 %	0.1 % relative		
Wobbe index	other components < 5 %	0.1 % relative		
mean molecular mass	methane no restriction	0.1 % relative		
compression factor		0.1 % relative		
gross heating value	no compositional restrictions specified	0.1 % relative	Calculated values according to methods given in GPA 2172-09 (2009) using data tables from GPA 2145-09	
net heating value		0.1 % relative		
relative density		0.1 % relative		
compressibility factor		0.1 % relative		
gross heating value	no compositional restrictions specified	0.1 % relative	Calculated values according to methods given in ASTM D3588-98 (2011) using data tables from GPA 2145-09	
net heating value		0.1 % relative		
relative density		0.1 % relative		
density		0.1 % relative		
compressibility factor		0.1 % relative		
SULPHUR GAS MIXTURES	amount fraction (ppm mol/mol)	amount fraction (ppm mol/mol)	In-house method TM002/UT	Uttoxeter
hydrogen sulphide	0.2 to 10	2 % relative + 0.03	Calibration of gas mixtures using gas chromatography with sulphur chemiluminescence detection (SCD)	
carbonyl sulphide	0.2 to 10	2 % relative + 0.03		
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		
1-propanethiol (n-propyl mercaptan)	0.2 to 10	4 % relative + 0.03		
2-propanethiol (iso-propyl mercaptan)	0.2 to 10	2 % relative + 0.03		