


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 0408 Accredited to ISO/IEC 17025:2017	BOC Ltd	
	Issue No: 038	Issue date: 08 November 2018
	The Priestley Centre 10 Priestley Road The Surrey Research Park Guildford Surrey GU2 7XY	Contact: Dr K D Cleaver Tel: +44 (0)1483 244308 Fax: +44 (0)1483 450741 E-Mail: kevin.cleaver@boc.com Website: www.boconline.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 The Priestley Centre 10 Priestley Road The Surrey Research Park Guildford Surrey GU2 7XY	Local contact Dr K D Cleaver Tel: +44 (0)1483 244308 Fax: +44 (0)1483 450741 Email: kevin.cleaver@boc.com	Head Office A Guildford
Address 28 Deer Park Road London SW19 3UF	Local contact Mr Dave Price Tel: +44 (0)20 8542 6677 Fax: +44 (0)20 8543 9678 Email: dave.price@boc.com	MOT Mixture Binary Gas Mixtures Ethanol/Air Mixture B Morden
Address Hobson Way Stallingborough Immingham NE Lincolnshire DN41 8DZ	Local contact Mr Walter Branowsky Tel: +44 (0)1469 577977 Fax: +44 (0)1469 576493 Email: walter.branowsky@boc.com	Natural Gas Mixtures Multi-component Gravimetric Gas Mixtures C Immingham



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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
GAS MIXTURES				
QUATERNARY GAS MIXTURES	Volume fraction			B
Carbon monoxide	3.5 %	1.0 % relative		
Carbon dioxide	14 %	1.0 % relative		
Propane	2000 ppm	1.0 % relative		
Nitrogen	balance			
BINARY GAS MIXTURES	Amount fraction (mol/mol)			B
Propane/air	1.7 ppm to 4 ppm 4 ppm to 10 ppm 10 ppm to 30 ppm 30 ppm to 100 ppm 100 ppm to 1000 ppm	6.6 % to 3.1 % relative 3.1 % to 1.8 % relative 1.8 % to 1.0 % relative 1.0 % to 0.90 % relative 1.5 % to 0.90 % relative	Certification of binary gas mixtures against nationally traceable gas reference standards	
Carbon monoxide/nitrogen	2 ppm to 10 ppm 10 ppm to 20 ppm 20 ppm to 55 ppm 55 ppm to 100 ppm 100 ppm to 1000 ppm 1000 ppm to 2400 ppm 2400 ppm to 1 % 1 % to 2.4 % 2.4 % to 10 %	2.6 % to 1.2 % relative 2.7 % to 1.6 % relative 1.6 % to 1.0 % relative 1.0 % relative 1.5 % to 0.90 % relative 1.6 % to 1.0 % relative 1.0 % to 0.90 % relative 1.6 % to 1.0 % relative 1.0 % to 0.90 % relative		
Carbon monoxide/air	2 ppm to 10 ppm 10 ppm to 20 ppm 20 ppm to 55 ppm 55 ppm to 100 ppm 100 ppm to 1000 ppm 1000 ppm to 2400 ppm 2400 ppm to 1 % 1 % to 2.4 % 2.4 % to 6.25 %	2.6 % to 1.2 % relative 2.7 % to 1.6 % relative 1.6 % to 1.0 % relative 1.0 % relative 1.5 % to 0.90 % relative 1.6 % to 1.0 % relative 1.0 % to 0.90 % relative 1.6 % to 1.0 % relative 1.0 % to 0.90 % relative		
Carbon dioxide/nitrogen	0.1 % to 0.22 % 0.26 % to 1 % 1 % to 5 % 5 % to 15 %	1.6 % to 1.0 % relative 1.0 % to 0.80 % relative 1.2 % to 0.90 % relative 1.1 % to 0.80 % relative		
Nitric oxide/nitrogen	2 ppm to 20 ppm 20 ppm to 100 ppm 100 ppm to 240 ppm 240 ppm to 1000 ppm 1000 ppm to 2400 ppm 2400 ppm to 1 %	1.4 % to 1.3 % relative 1.1 % to 0.80 % relative 1.6 % to 1.0 % relative 1.0 % to 0.90 % relative 1.6 % to 1.0 % relative 1.0 % to 0.90 % relative		
Oxygen/nitrogen	0.5 % to 1.65 % 1.65 % to 5 % 5 % to 25 %	2.2 % to 1.0 % relative 1.0 % to 0.90 % relative 1.5 % to 1.1 % relative		



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BINARY GAS MIXTURES (cont'd)				
Sulphur dioxide/nitrogen	10 ppm to 30 ppm 30 ppm to 60 ppm 60 ppm to 100 ppm 100 ppm to 140 ppm 140 ppm to 300 ppm 300 ppm to 550 ppm 550 ppm to 1000 ppm 1000 ppm to 3000 ppm	1.8 % to 1.4 % relative 1.7 % to 1.2 % relative 1.2 % to 1.1 % relative 1.5 % to 1.0 % relative 1.0 % to 0.7 % relative 1.5 % to 1.0 % relative 1.0 % to 0.7 % relative 0.9 % to 0.5 % relative		B
ETHANOL IN AIR CALIBRATION STANDARD FOR EVIDENTIAL BREATH TESTING				
Ethanol/air	35 µg Ethanol per 100 ml air equivalent to 191.4 ppm mol/mol	0.4 µg per 100 ml air 2.1 ppm mol/mol (1.1 % relative)		
	22 µg Ethanol per 100 ml air equivalent to 120.3 ppm mol/mol	0.3 µg per 100 ml air 1.6 ppm mol/mol (1.3 % relative)		
	9 µg Ethanol per 100 ml air equivalent to 49.2 ppm mol/mol	0.2 µg per 100 ml air 1.0 ppm mol/mol (1.9 % relative)		
NATURAL GAS MIXTURES	Amount fraction (% mol/mol)	Amount fraction (% mol/mol)	Certification of Natural Gas mixtures against nationally traceable gas reference standards using gas chromatography in accordance with BS EN ISO 6143:2006	C
Methane	55 to 100	0.05		
Ethane	0.008 to 1.5 1.5 to 11	0.28 % relative + 0.0003 0.3 % relative		
Propane	0.01 to 0.5 0.5 to 8	0.25 % relative + 0.0005 0.35 % relative		
i-Butane	0.004 to 0.25 0.25 to 1.2	0.46 % relative + 0.0001 0.5 % relative		
n-Butane	0.004 to 0.25 0.25 to 1.3	0.46 % relative + 0.0001 0.5 % relative		
i-Pentane	0.003 to 0.2 0.2 to 0.4	0.45 % relative + 0.0001 0.5 % relative		
n-Pentane	0.003 to 0.2 0.2 to 0.4	0.45 % relative + 0.0001 0.5 % relative		



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NATURAL GAS MIXTURES (continued)	Amount fraction (% mol/mol)	Amount fraction (% mol/mol)		C
neo-Pentane	0.002 to 0.4	0.8 % relative + 0.0001		
Hexane	0.0009 to 0.1 0.1 to 0.35	0.5 % relative + 0.0001 0.6 % relative		
Nitrogen	0.02 to 20.4	0.2 % relative + 0.002		
Carbon dioxide	0.09 to 12	0.2 % relative + 0.002		
Calculated values for:			Calculation of physical properties in accordance with BS EN ISO 6976: 2005 and/or BS EN ISO 6976: 2016	
Gross calorific value Net calorific value Density Relative density Gross Wobbe index Net Wobbe index Mean Molecular Mass Compression Factor				
GAS MIXTURES	Amount fraction (% mol/mol)		Multi-component gaseous mixtures prepared by gravimetry in accordance with BS EN ISO 6142:2006 with analytical validation against traceable standards.	C
C ₁ - C ₃	0.0008 to 100	Amount fractions from (1 to 100) % mol/mol: 0.5 % relative		
C ₄	0.001 to 50			
C ₅	0.001 to 9			
C ₆	0.001 to 1.5			
C ₇	0.001 to 0.5	Amount fractions from (0.1 to 1) % mol/mol: 1 % relative		
C ₈	0.001 to 0.2		Where more than 5 components fall within the above scope for Natural Gas, certification shall be using nationally traceable gas reference standards.	
C ₉	0.001 to 0.2			
C ₁₀	0.001 to 0.05			
Benzene	0.001 to 1	Amount fractions from (0.0008 to 0.1) % mol/mol: 2 % relative		
Toluene	0.001 to 0.4			
Xylenes, m, p and o	0.001 to 0.1			
Argon	0.1 to 100			
Carbon dioxide	0.03 to 100			
Carbon monoxide	0.001 to 100			
Helium	0.1 to 100			
Hydrogen	0.08 to 100			
Nitrogen	0.1 to 100			
Oxygen	0.05 to 100			
END				