

STACK EMISSIONS MONITORING REPORT



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Permit:

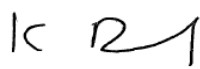
EPR Permit: EPR/BX4666IZ/V002

Release Point:

A11 - Solvent Cleaning Line

Sampling Date(s):

17th November 2015

ESG Job Number:	LNO 12696
Report Date:	4th January 2015
Version:	1
Report By:	Dominic Houghton
MCERTS Number:	MM 04 529
MCERTS Level:	MCERTS Level 2 - Team Leader
Technical Endorsements:	1, 2, 3 & 4
Report Approved By:	Keith Bird
MCERTS Number:	MM 07 825
Business Title:	MCERTS Level 2 - Team Leader
Technical Endorsements:	1, 2 3 & 4
Signature:	



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EXECUTIVE SUMMARY

MONITORING OBJECTIVES

Qioptiq Ltd operates an optical lens cleaning process at St Asaph which is subject to EPR Permit EPR/BX4666IZ/V002, under the Environmental Permitting Regulations 2010.

ESG were commissioned by Qioptiq Ltd to carry out stack emissions monitoring to determine the release of prescribed pollutants from the following Plant under normal operating conditions.

The results of these tests shall be used to demonstrate compliance with a set of emission limit values for prescribed pollutants as specified in the Plant's EPR Permit, EPR/BX4666IZ/V002.

Plant

A11 - Solvent Cleaning Line

Operator

Qioptiq Ltd
Glascoed Road
St Asaph
Denbighshire
LL17 0LL

EPR Permit: EPR/BX4666IZ/V002

Stack Emissions Monitoring Test House

ESG - Stockport Laboratory
Unit 5 Crown Industrial Estate
Kenwood Road
Stockport
SK5 6PH
UKAS and MCERTS Accreditation Number: 1015

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
MCERTS accredited results will only be claimed where both the sampling and analytical stages are UKAS accredited.
This test report shall not be reproduced, except in full, without written approval of ESG.

EXECUTIVE SUMMARY

EMISSIONS SUMMARY					
Parameter	Units	Result	Calculated Uncertainty +/-	Limit	MCERTS accredited result
VOC Screening	mg/m ³	22	5.4	75	✗
VOC Screening Emission Rate	g/hr	17	4.2	-	
Stack Gas Temperature	°C	29	-	-	✓
Stack Gas Velocity	m/s	3.2	0.23	-	
Gas Volumetric Flow Rate (Actual)	m ³ /hr	866	74	-	
Gas Volumetric Flow Rate (STP, Wet)	m ³ /hr	772	66	-	
Gas Volumetric Flow Rate (STP, Dry)	m ³ /hr	764	66	-	
Gas Volumetric Flow Rate at Reference Conditions	m ³ /hr	772	66	-	

ND = None Detected,

Results at or below the limit of detection are highlighted by bold italic text.

The above volumetric flow rate is calculated using data from the preliminary survey. Mass emissions for non isokinetic tests are calculated using these values. For all isokinetic testing the mass emission is calculated using test specific flow data and not the above values.

Reference conditions are 273K, 101.3kPa without correction for water vapour

EXECUTIVE SUMMARY

MONITORING TIMES			
Parameter	Sampling Date(s)	Sampling Times	Sampling Duration
VOC Screening Run 1	17 November 2015	13:33 - 14:03	30 minutes
Preliminary Stack Traverse	17 November 2015	13:25	-

EXECUTIVE SUMMARY

PROCESS DETAILS

Parameter	Process Details
Description of process	Optical Lens Cleaning
Continuous or batch	Batch
Product Details	Optical Lens Baths
Part of batch to be monitored (if applicable)	Any
Normal load, throughput or continuous rating	1 Lens per hour
Fuel used during monitoring	N/A
Abatement	None
Plume Appearance	None visible

EXECUTIVE SUMMARY

Monitoring Methods

The selection of standard reference / alternative methods employed by ESG is determined, wherever possible by the hierarchy of method selection outlined in Environment Agency Technical Guidance Note (Monitoring) M2. i.e. CEN, ISO, BS, US EPA etc.

MONITORING METHODS						
Species	Method Standard Reference Method / Alternative Method	ESG Technical Procedure	UKAS Lab Number	MCERTS Accredited Method	Limit of Detection (LOD)	Calculated MU +/- %
VOC Screening	SRM - BS EN 13649	AE 118	1015	Yes	0.13 mg/m ³	25 %
Velocity	SRM - BS EN ISO 16911-1	AE 154	1015	Yes	5 Pa	7.3 %
Volumetric Flow Rate	SRM - BS EN ISO 16911-1	AE 154	1015	Yes	-	8.6 %

EXECUTIVE SUMMARY

Analytical Methods

The following tables list the analytical methods employed together with the custody and archiving details:

SAMPLING METHODS WITH SUBSEQUENT ANALYSIS							
Species	Analytical Technique	Analytical Procedure	UKAS Lab Number	UKAS Accredited Lab Analysis	Analysis Lab (ESG or Subcontract)	Sample Archive Location	Archive Period
VOC Screening	ATD-GC-MS	ASC	1015	No	ESG - Bretby	ESG - Bretby	3 months

ON-SITE TESTING							
Species	Analytical Technique	Analytical Procedure	UKAS Lab Number	MCERTS Accredited Analysis	Laboratory	Data Archive Location	Archive Period
-	-	-	-	-	-	-	-

EXECUTIVE SUMMARY

SAMPLING LOCATION					
Sampling Plane Validation Criteria	Value	Units	Requirement	Compliant	Method
Lowest Differential Pressure	6	Pa	≥ 5 Pa	Yes	BS EN 15259
Lowest Gas Velocity	3.2	m/s	-	-	-
Highest Gas Velocity	3.2	m/s	-	-	-
Ratio of Gas Velocities	1.0	: 1	$< 3 : 1$	Yes	BS EN 15259
Mean Velocity	3.2	m/s	-	-	-
Maximum angle of flow with regard to duct axis	< 15	$^{\circ}$	$< 15^{\circ}$	Yes	BS EN 15259
No local negative flow	Yes	-	-	Yes	BS EN 15259

DUCT CHARACTERISTICS		
	Value	Units
Shape	Circular	-
Depth	0.31	m
Width	-	m
Area	0.08	m ²
Port Depth	0	mm

SAMPLING LINES & POINTS		
	Isokinetic	Non-Iso & Gases
Sample port size	-	1cm Hole
Number of lines used	-	1
Number of points / line	-	1
Duct orientation	-	Vertical
Filtration	-	Out Stack

SAMPLING PLATFORM	
General Platform Information	
Permanent / Temporary Platform / Ground level / Floor Level / Roof	Roof
Inside / Outside	Outside

M1 Platform requirements	
Is there a sufficient working area so work can be performed in a compliant manner	Yes
Platform has 2 levels of handrails (approximately 0.5 m & 1.0 m high)	Yes
Platform has vertical base boards (approximately 0.25 m high)	Yes
Platform has removable chains / self closing gates at the top of ladders	N/A
Handrail / obstructions do not hamper insertion of sampling equipment	Yes
Depth of Platform = $\geq$ Stack depth / diameter + wall and port thickness + 1.5m	Yes

Sampling Platform Improvement Recommendations (if applicable)

The sampling location meets all the requirements as specified in EA Guidance Note M1.

EXECUTIVE SUMMARY

Sampling & Analytical Method Deviations

In this instance there were no deviations from the sampling and analytical methods employed.

APPENDICES

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APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

APPENDIX 3 - Measurement Uncertainty Budget Calculations

APPENDIX 1 - Monitoring Schedule, Calibration Checklist & Monitoring Team

MONITORING SCHEDULE					
Species	Method Standard Reference Method / Alternative Method	ESG Technical Procedure	UKAS Lab Number	MCERTS Accredited Method	Number of Samples
VOC Screening	SRM - BS EN 13649	AE 118	1015	Yes	1
Velocity	SRM - BS EN ISO 16911-1	AE 154	1015	Yes	1

APPENDIX 1 - Monitoring Schedule, Calibration Checklist & Monitoring Team

CALIBRATEABLE EQUIPMENT CHECKLIST					
Extractive Sampling		Instrumental Analyser/s		Miscellaneous	
Equipment	Equipment I.D.	Equipment	Equipment I.D.	Equipment	Equipment I.D.
Control Box DGM	-	Horiba PG-250 Analyser	-	Laboratory Balance	LNO 00-12/00-13
Box Thermocouples	-	FT-IR	-	Tape Measure	LNO 24-DJH
Meter In Thermocouple	-	FT-IR Oven Box	-	Stopwatch	LNO 17-DJH
Meter Out Thermocouple	-	Bernath 3006 FID	-	Protractor	-
Control Box Timer	-	Signal 3030 FID	-	Barometer	LNO 08-DJH
Oven Box	-	Servomex	-	Digital Micromanometer	LNO 01-DJH
Probe	-	JCT Heated Head Filter	-	Digital Temperature Meter	LNO 03-DJH
Probe Thermocouple	-	Thermo FID	-	Stack Thermocouple	-
Probe	-	Stackmaster	-	Mass Flow Controller	LNO 29-13
Probe Thermocouple	-	FTIR Heater Box for Heated Line	-	MFC Display module	LNO 29-11
S-Pitot	LNO 06-DJH	Anemometer	-	1m Heated Line (1)	-
L-Pitot	LNO 10-104	Ecophysics NOx Analyser	-	1m Heated Line (2)	-
Site Balance	LNO 14-DJH	Chiller (JCT/MAK 10)	-	1m Heated Line (3)	-
Last Impinger Arm	-	Heated Line Controller (1)	-	5m Heated Line (1)	-
Dioxins Cond. Thermocouple	-	Heated Line Controller (2)	-	10m Heated Line (1)	-
Callipers	-	Site temperature Logger	-	10m Heated Line (2)	-
Small DGM	-		-	15m Heated Line (1)	-
Heater Controller	-		-	20m Heated Line (1)	-
Inclinometer (Swirl Device)	LNO 23-DJH		-	20m Heated Line (2)	-

NOTE: If the equipment I.D is represented by a dash (-), then this piece of equipment has not been used for this test.

CALIBRATION GASES					
Gas (traceable to ISO 17025)	Cylinder I.D Number	Supplier	ppm	%	Analytical Tolerance +/- %
-	-	-	-	-	-

STACK EMISSIONS MONITORING TEAM

MONITORING TEAM								
Personnel	MCERTS Number	MCERTS		TE / H&S Qualifications and Expiry Date				
		Level	Expiry	TE1	TE2	TE3	TE4	H&S
Dominic Houghton	MM 04 529	MCERTS Level 2	Dec-16	Dec-16	Dec-16	Mar-18	Dec-16	Sep-19
Mark Derbyshire	MM 07 824	MCERTS Level 1	Dec-17	-	-	-	-	Nov-18

APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

VOC SCREENING SUMMARY					
Test	Sampling Times	Concentration mg/m ³	LOD mg/m ³	Limit mg/m ³	Emission Rate g/hr
Run 1	13:33 - 14:03 17 November 2015	22	0.13	75	17
Field Blank	-	0.17	-	-	-

Reference conditions are 273K, 101.3kPa without correction for water vapour

VOC SCREENING RESULTS							
Substance	LOD (ug)	Run 1 (ug)		Run 1 (mg/m ³)			Mass Emission (g/hr)
		Front	Back	Front	Back	Total	
Acetone	0.02	8.3	7.5	5.5	5	10.53	8.1
Limonene	0.02	6	0.02	4.0	0.01	4.01	3.1
Unknown	0.02	3.3	0.02	2.2	0.01	2.21	1.7
Unknown	0.02	2.5	0.02	1.67	0.01	1.68	1.3
1-methy-2-pyrrolidinone	0.02	2.1	0.02	1.40	0.01	1.41	1.1
Xylenes	0.02	0.5	0.02	0.33	0.01	0.35	0.27
Dichloromethane	0.02	0.43	0.38	0.29	0.25	0.54	0.42
Ethanol	0.02	0.39	0.35	0.26	0.23	0.49	0.38
2-Butoxy ethanol	0.02	0.39	0.02	0.26	0.01	0.27	0.21
1-(2-butoxyethoxy)-ethanol	0.02	0.39	0.02	0.26	0.01	0.27	0.21
Total	0.20	24.30	8.37	16.20	5.58	21.78	17

APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

VOC SCREENING RESULTS BLANK			
Substance	LOD (ug)	Blank (ug)	
		(ug)	mg/m ³
Acetone	0.02	0.07	0.047
Limonene	0.02	0.02	0.013
Unknown	0.02	0.02	0.013
Unknown	0.02	0.02	0.013
1-methy-2-pyrrolidinone	0.02	0.02	0.013
Xylenes	0.02	0.02	0.013
Dichloromethane	0.02	0.02	0.013
Ethanol	0.02	0.02	0.013
2-Butoxy ethanol	0.02	0.02	0.013
1-(2-butoxyethoxy)-ethanol	0.02	0.02	0.013
Total	0.20	0.25	0.167

APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

VOC SCREENING QUALITY ASSURANCE

Leak Test Results	Mean Sampling Rate l/min	Pre sampling leak rate l/min	Post sampling leak rate l/min	Acceptable leak rate l/min	Leak Tests Acceptable?
Run 1	0.05	0.0003	0.0003	0.001	Yes

	Type of tube	Max. Tube Temperature °C	Max. Storage / Transit Temp. °C
Run 1	Tenax ATD	18	16

APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

PRELIMINARY STACK SURVEY

Stack Characteristics		
Stack Diameter / Depth, D	0.31	m
Stack Width, W	-	m
Stack Area, A	0.08	m ²
Average stack gas temperature	29	°C
Stack static pressure	0.01	kPa
Barometric Pressure	99.8	kPa

Stack Gas Composition & Molecular Weights								
Component	Molar Mass M	Density kg/m ³ p	Conc Dry % Vol	Dry Volume Fraction r	Dry Conc kg/m ³ pi	Conc Wet % Vol	Wet Volume Fraction r	Wet Conc kg/m ³ pi
CO ₂	44	1.963059	0.030000	0.000300	0.000589	0.029700	0.000297	0.000583
O ₂	32	1.427679	20.950000	0.209500	0.299099	20.740500	0.207405	0.296108
N ₂	28	1.249219	79.020000	0.790200	0.987133	78.229800	0.782298	0.977262
H ₂ O	18	0.803070	-	-	-	1.000000	0.010000	0.008031

Where: $p = M / 22.41$ $pi = r \times p$

Calculation of Stack Gas Densities		
Determinand	Result	Units
Dry Density (STP), P_{STD}	1.2868	kg/m ³
Wet Density (STP), P_{STW}	1.2820	kg/m ³
Dry Density (Actual), P_{Actual}	1.1461	kg/m ³
Average Wet Density (Actual), $P_{ActualW}$	1.142	kg/m ³

Where:

P_{STD} = sum of component concentrations, kg/m³ (not including water vapour)

$P_{STW} = (P_{STD} + pi \text{ of H}_2\text{O}) / (1 + (pi \text{ of H}_2\text{O} / 0.8036))$

$P_{Actual} = P_{STD} \times (Ts / Ps) \times (Pa / Ta)$

$P_{ActualW} = P_{STW} \times (Ts / Ps) \times (Pa / Ta)$

APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

PRELIMINARY STACK SURVEY

TRAVERSE 1

Date of Survey	17 November 2015
Time of Survey	13:25
Velocity Measurement Device:	L-Type Pitot

Sampling Line A								
Traverse Point	Distance into duct (m)	DP pt mmH ₂ O (average of 3 readings)	DP pt Pa (average of 3 readings)	Temp °C	Velocity m/s	Volumetric Flow Rate (actual) m ³ /s	O ₂ % Vol	Angle of Swirl °
1	0.16	0.7	7	29	3.19	0.24	-	<15
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
Mean	-	0.7	7	29	3.19	0.24	-	

Sampling Line B								
Traverse Point	Distance into duct (m)	DP pt mmH ₂ O (average of 3 readings)	DP pt Pa (average of 3 readings)	Temp °C	Velocity m/s	Volumetric Flow Rate (actual) m ³ /s	O ₂ % Vol	Angle of Swirl °
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
Mean	-	-	-	-	-	-	-	

PRELIMINARY STACK SURVEY QUALITY ASSURANCE CHECKLIST

PITOT LEAK CHECK								
Run	Pre Traverse Leak Rate				Post Traverse Leak Rate			
	Start Value mmH ₂ O	End Value mmH ₂ O	Difference %	Outcome	Start Value mmH ₂ O	End Value mmH ₂ O	Difference %	Outcome
Run 1	142	140	1.4	Pass	132	130	1.5	Pass

To complete a compliant pitot leak check a pressure of over 80 mmH₂O (or 800 Pa) is applied and the pressure drop monitored over 5 mins. A drop of ≤ 5% must be observed.

L-Type Pitot Blockage Test				
Run	Final Reading (Pa)	Reading After Purge (Pa)	Difference (%)	Outcome (Permitted +/- 5%)
Run 1	10	10	0.0	Pass

APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

PRELIMINARY STACK SURVEY (CONTINUED)

Sampling Plane Validation Criteria				
EA Technical Guidance Note (Monitoring) M1	Result	Units	Requirement	Compliant
Lowest Differential Pressure	7.2	Pa	$\geq 5 \text{ Pa}$	Yes
Lowest Gas Velocity	3.2	m/s	-	-
Highest Gas Velocity	3.2	m/s	-	-
Ratio of Gas Velocities	1.0	-	$< 3 : 1$	Yes
Maximum angle of flow with regard to duct axis	0	°	$< 15^\circ$	Yes
No local negative flow	Yes	-	-	Yes

Calculation of Stack Gas Velocity, V		
Velocity at Traverse Point, $V = K_{pt} \times (1-e) \times \sqrt{2 \times DP_{pt} / \rho_{ActualW}}$		
Where: K_{pt} = Pitot tube calibration coefficient $(1-e)$ = Compressibility correction factor, assumed at a constant 0.998		
Average Stack Gas Velocity, V_a	3.2	m/s

Calculation of Stack Gas Volumetric Flowrate, Q			
Duct gas flow conditions	Actual	Reference	Units
Temperature	29	0	°C
Total Pressure	99.81	101.3	kPa
Oxygen	21.0	21	%
Moisture	1.00	1.00	%
Pitot tube calibration coefficient, K_{pt}	0.90		

Gas Volumetric Flowrate	Result	Units
Average Stack Gas Velocity (V_a)	3.19	m/s
Stack Area (A)	0.08	m ²
Gas Volumetric Flowrate (Actual), Q_{Actual}	866	m ³ /hr
Gas Volumetric Flowrate (STP, Wet), Q_{STP}	772	m ³ /hr
Gas Volumetric Flowrate (STP, Dry), $Q_{STP,Dry}$	764	m ³ /hr
Gas Volumetric Flowrate (REF), Q_{Ref}	772	m ³ /hr

Where:

$$Q_{Actual} = V_a \times A \times 3600$$

$$Q_{STP} = Q_{Actual} \times (T_s / T_a) \times (P_a / P_s) \times 3600$$

$$Q_{STP,Dry} = Q_{STP} / (100 - (100 / Ma)) \times 3600$$

$$Q_{Ref} = Q_{STP} \times ((100 - Ma) / (100 - Ms)) \times ((20.9 - O_{2a}) / (20.9 - O_{2s}))$$

Nomenclature:

T_s = Absolute Temperature, Standard Conditions, 273 K

P_s = Absolute Pressure, Standard Conditions, 101.3 kPa

T_a = Absolute Temperature, Actual Conditions, K

P_a = Absolute Pressure, Actual Conditions, kPa

Ma = Water vapour, Actual Conditions, % Vol

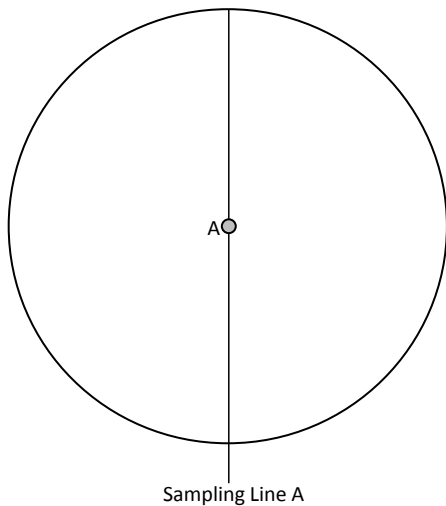
Ms = Water vapour, Reference Conditions, % Vol

O_{2a} = Oxygen, Actual Conditions, % Vol

O_{2s} = Oxygen, Reference Conditions, % Vol

STACK DIAGRAM

	Value	Units
Stack Depth	0.31	m
Stack Width	-	m
Area	0.08	m ²



- Isokinetic sampling point
- Isokinetic sampling points not used
- Non Isokinetic/Gases sampling point

Non-Isokinetic/Gases Sampling			
Sampling Point	Distance (% of Depth)	Distance into Stack	Units
A	50	0.16	m

[illegible]

SAMPLING LOCATION



APPENDIX 3 - Measurement Uncertainty Budget Calculations

MEASUREMENT UNCERTAINTY BUDGET - VOC SCREENING

Standard Uncertainty

Run	Sampled Volume m ³	Sampled Gas Temp K	Sampled Gas Pressure kPa	Sampled Gas Humidity % by volume	Oxygen Content % by volume	Limit of Detection % by mass	Leak %	Uncollected Mass mg
MU required	≤ 2%	≤ 2%	≤ 1%	≤ 1%	≤ 10%	≤ 5% of ELV	≤ 2%	≤ 10% of ELV
Run 1	0.0000	2	0.5	1.0	N/A	0.0002	-	-
as a %	0.0000	0.69	0.50	1.0	N/A	0.18	0.60	0.0003
compliant?	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes

Run	Volume (STP) m ³	Mass of Total VOC mg	O ₂ Correction -	Leak mg/m ³	Uncollected Mass mg	Lab Uncertainty mg	Combined uncertainty
Run 1	0.001	0.033	1.0	0.075	0.000	-	-
MU as mg/m ³	0.000000001	0.133	-	0.075	0.096	2.723	2.729
MU as %	0.000000005	0.612	-	0.346	0.442	12.500	-

R1 - Uncertainty expressed at a 95% confidence level (where k = 2)	5.5	mg/m³	25	%
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Developed for the STA by R Robinson, NPL

APPENDIX 3 - Measurement Uncertainty Budget Calculations

MEASUREMENT UNCERTAINTY BUDGET - VELOCITY & VOLUMETRIC FLOW RATE

Measured Velocity at Actual Conditions	3.2	m/s
Measured Volumetric Flow rate at Actual Conditions	866	m³/hr

Performance Characteristics & Source of Value	Units	Values	Requirement	Compliant
Uncertainty of Local Gas Velocity Determination				
Uncertainty of pitot tube coefficient	-	0.010		
Uncertainty of mean local dynamic pressures	-	0.33		
Factor loading, function of the number of measurements.	3 readings	0.591	minimum 3	Yes
Range of measurement device	pa	1000		
Resolution	pa	1.00		
Calibration uncertainty	pa	2.07	<1% of Value or 20 Pa whichever is greater	Yes
Drift	% range	0.10		
Linearity	% range	0.06	<2% of value	Yes
Uncertainty of gas density determination				
Uncertainty of molar mass determination	kg/mol	0.00003		
Uncertainty of temperature measurement	K	1.54	<1% of value	Yes
Uncertainty of absolute pressure in the duct	pa	509		
Uncertainty associated with the estimate of density	-	0.007		
Uncertainty associated with the measurement of local velocity	-	0.0001		
Uncertainty associated with the measurement of mean velocity	-	0.0014		

Measurement Uncertainty - Velocity	m/s
Combined uncertainty	0.12
Expanded uncertainty at a 95% Confidence Interval	0.23

Note - The expanded uncertainty uses a coverage factor of $k = 2$.

Expanded Measurement Uncertainty of Velocity at a 95% Confidence Interval	%
Expressed as a % of the Measured Concentration	3.7
Expanded uncertainty at a 95% Confidence Interval	7.3

Measurement Uncertainty Volumetric Flow Rate	m³/hr
Combined uncertainty	38
Expanded uncertainty at a 95% Confidence Interval	75

Note - The expanded uncertainty uses a coverage factor of $k = 2$.

Expanded Measurement Uncertainty of Volumetric Flow Rate at a 95% Confidence Interval	%
Expressed as a % of the Measured Concentration	4.4
Expanded uncertainty at a 95% Confidence Interval	8.6

END OF REPORT