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Stack Emissions Testing Report Commissioned by
H Westons & Sons Ltd

Installation Name & Address

H Westons & Sons Ltd
The Bounds
Much Marcle
Ledbury
Herefordshire
HR8 2NQ

EPR Permit: EPR/QP3420LA/P001

Stack Reference

3.5kW Big Boiler

Dates of the Monitoring Campaign

20th November 2025

Job Reference Number

EMT14733

Report Written by

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MM 02 122
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Report Date

28th November 2025

Version

Version 1

Signature of Report Approver

CONTENTS

TITLE PAGE

CONTENTS

EXECUTIVE SUMMARY

Monitoring Objectives	3
Monitoring Results	4
Monitoring Dates & Times	5
Process Details	6
Monitoring & Analytical Methods	7
Summary of Sampling Deviations	7
Sampling Location	8
Plant Photos / Sample Points	9

APPENDIX 1 - Monitoring Personnel & List of Equipment

APPENDIX 2 - Raw Data, Sampling Equations & Charts

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Executive Summary

(Page 1 of 7)

MONITORING OBJECTIVES

H Westons & Sons Ltd, Ledbury

3.5kW Big Boiler

20th November 2025

Overall Aim of the Monitoring Campaign

Element were commissioned by H Westons & Sons Ltd to carry out stack emissions testing on the 3.5kW Big Boiler at Ledbury.

The aim of the monitoring campaign was to demonstrate compliance with a set of emission limit values (ELVs) as specified in the Site's Permit.

Special Requirements

There were no special requirements.

Target Parameters

Total Particulate Matter, Sulphur Dioxide, Total VOCs (as Carbon), Oxides of Nitrogen (as NO₂), Carbon Monoxide

Executive Summary

(Page 2 of 7)

MONITORING RESULTS

H Westons & Sons Ltd, Ledbury

3.5kW Big Boiler

20th November 2025

where MU = Measurement Uncertainty associated with the Result

Parameter	Concentration				Mass Emission			
	Units	Result	MU +/-	Limit	Units	Result	MU +/-	Limit
Total Particulate Matter ¹	mg/m ³	3.1	0.38	5	g/hr	5.8	1.3	-
Sulphur Dioxide ¹	mg/m ³	52.6	2.7	-	g/hr	99.4	18.4	-
Total VOCs (as Carbon) ¹	mg/m ³	1.5	1.0	-	g/hr	2.8	2.0	-
Oxides of Nitrogen (as NO ₂) ¹	mg/m ³	83.1	3.2	150	g/hr	157	28.7	-
Carbon Monoxide ¹	mg/m ³	5.8	0.76	-	g/hr	11.0	2.4	-
Oxygen	% v/v	Dry 9.7	0.27					
Water Vapour	% v/v	6.0	0.29					
Stack Gas Temperature	°C	155						
Stack Gas Velocity	m/s	9.2	1.6					
Volumetric Flow Rate (ACTUAL)	m ³ /hr	3181	568					
Volumetric Flow Rate (REF) ¹	m ³ /hr	1889	337					

NOTE: VOLUMETRIC FLOW RATE & VELOCITY DATA TAKEN FROM AN AVERAGE OF ALL OF THE ISOKINETIC RUNS.

¹ Reference Conditions (REF) are: 273K, 101.3kPa, dry gas.

Executive Summary

(Page 3 of 7)

MONITORING DATE(S) & TIMES

H Westons & Sons Ltd, Ledbury
 3.5kW Big Boiler
 20th November 2025

Parameter		Units	Concentration	Units	Mass Emission	Sampling Date(s)	Sampling Times	Duration mins
Total Particulate Matter	R1	mg/m ³	3.1	g/hr	5.8	20/11/2025	10:47 - 11:47	60
Sulphur Dioxide	R1	mg/m ³	52.6	g/hr	99.4	20/11/2025	10:47 - 11:47	60
Total VOCs (as Carbon)	R1	mg/m ³	1.5	g/hr	2.8	20/11/2025	10:47 - 11:47	60
Oxides of Nitrogen (as NO ₂)	R1	mg/m ³	83.1	g/hr	157	20/11/2025	10:47 - 11:47	60
Carbon Monoxide	R1	mg/m ³	5.8	g/hr	11.0	20/11/2025	10:47 - 11:47	60
Oxygen	R1	% v/v	9.7			20/11/2025	10:47 - 11:47	60
Velocity Traverse	R1					20/11/2025	10:20 - 10:25	

All results are expressed at the respective reference conditions.

Executive Summary

(Page 4 of 7)

PROCESS DETAILS

H Westons & Sons Ltd, Ledbury
 3.5kW Big Boiler
 20th November 2025

Standard Operating Conditions

Parameter	Value
Process Status	Operating
Capacity (of 100%) and Tonnes / Hour	3.5kW
Continuous or Batch Process	Modulation between 1 - 100% during testing period
Feedstock (if applicable)	Furnace Fuel
Abatement System	None
Abatement System Running Status	N/A
Fuel	Furnace Fuel Oil
Plume Appearance	None Visable

Executive Summary

(Page 5 of 7)

MONITORING & ANALYTICAL METHODS

H Westons & Sons Ltd, Ledbury
 3.5kW Big Boiler
 20th November 2025

Parameter	Monitoring				Analysis				Overall Status	LOD (Average)
	Standard	Technical Procedure	Sampling Status	Testing Lab	Analytical Procedure	Analytical Technique	Analysis Status	Analysis Lab		
Total Particulate Matter	EN 13284-1	MD 001	MCERTS	EET	MD 103	Gravimetric	MCERTS	EET	MCERTS	0.14 mg/m ³
Sulphur Dioxide	EN 14791	MD 009	MCERTS	EET	MD-101	IC	MCERTS	EET	MCERTS	0.011 mg/m ³
Water Vapour	EN 14790	MD 005	MCERTS	EET	MD 005	Gravimetric	MCERTS	EET	MCERTS	0.10 % v/v
Total VOCs (as Carbon)	EN 12619:2013	MD 020	MCERTS	EET	Flame Ionisation Detection by Sick 3006				MCERTS	0.32 mg/m ³
Oxides of Nitrogen (as NO ₂)	EN 14792	MD 039	MCERTS	EET	Chemiluminescence by Horiba PG-350E				MCERTS	0.41 mg/m ³
Carbon Monoxide	EN 15058	MD 039	MCERTS	EET	NDIR by Horiba PG-350E				MCERTS	0.35 mg/m ³
Oxygen	EN 14789	MD 039	MCERTS	EET	Dry Paramagnetic Cell by Horiba PG-350E				MCERTS	0.1 %
Velocity & Vol. Flow Rate	EN 16911-1 (MID)	MD 041	MCERTS	EET	Pitot Tube and Thermocouple				MCERTS	1.8 m/s

ANALYSIS LABORATORIES

(with short name reference as appears in the table above)

Element (Stockport Lab - EET)	ISO 17025 Accreditation Number: UKAS 4279
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SUMMARY OF SAMPLING DEVIATIONS

Parameter	Run	Deviation
All Parameters	All	There are no deviations associated with the sampling employed.

Executive Summary

(Page 6 of 7)

SUITABILITY OF SAMPLING LOCATION

Duct Characteristics

Parameter	Units	Value
Type	-	Circular
Depth	m	0.35
Width	m	-
Area	m ²	0.10
Port Depth	cm	9
Orientation of Duct	-	Vertical
Number of Ports	-	1
Sample Port Size	-	4" BSP

Location of Sampling Platform

General Platform Information	Value
Permanent / Temporary Platform	Temporary
Inside / Outside	Inside

Platform Details

EA Technical Guidance Note M1 / EN 15259 Platform Requirements	Value
Sufficient working area to manipulate probe and operate the measuring instruments	Yes
Platform has 2 levels of handrails (approx. 0.5m & 1.0m high)	Yes
Platform has vertical base boards (approx. 0.25m high)	Yes
Platform has chains / self closing gates at top of ladders	Yes
There are no obstructions present which hamper insertion of sampling equipment	Yes
Safe Access Available	Yes
Easy Access Available	Yes

Sampling Location / Platform Improvement Recommendations

The sampling location meets all the requirements specified in EA Guidance Note M1 and EN 15259, and therefore there are no improvement recommendations.

EN 15259 Homogeneity Test Requirements

There is no requirement to perform a EN 15259 Homogeneity Test on this Stack.

Sampling Plane Validation Criteria (from EN 15259)

Criteria in EN 15259	Units	Traverse 1	Required	Compliant
Lowest Differential Pressure	Pa	545	> 5 Pa	Yes
Mean Velocity	m/s	31.06	-	-
Lowest Gas Velocity	m/s	31.06	-	-
Highest Gas Velocity	m/s	31.06	-	-
Ratio of Above	: 1	1.00	< 3 : 1	Yes
Maximum Angle of Swirl	°	2.00	< 15°	Yes
No Local Negative Flow	-	Yes	-	Yes

Executive Summary
(Page 7 of 7)

PLANT PHOTOS

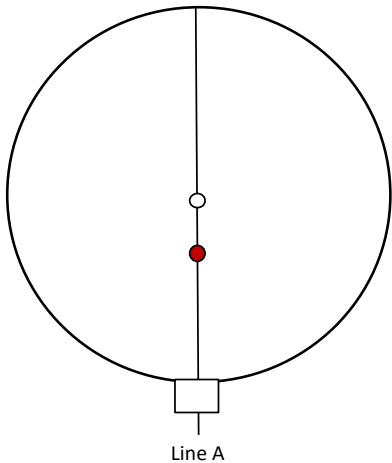
Photo 1



Photo 2



SAMPLE POINTS



- where
- = isokinetic point sampled at
 - = isokinetic point not sampled at
 - = combustion gases sample point
 - = non-isokinetic sample point

APPENDICES

APPENDIX CONTENTS

APPENDIX 1 - Stack Emissions Monitoring Personnel, List of Equipment & Methods and Technical Procedures Used

APPENDIX 2 - Summaries, Calculations, Raw Data and Charts

STACK EMISSIONS MONITORING PERSONNEL

Position	Name	MCERTS Accreditation	MCERTS Number	Technical Endorsements
Team Leader	Craig Harley	MCERTS Level 2	MM 05 670	TE1 TE2 TE3 TE4
Technician	Simon Dwyer	MCERTS Level 1	MM 23 1768	None

LIST OF EQUIPMENT

Extractive Sampling		Instrumental Analysers		Miscellaneous Items	
Equipment Type	Equipment I.D.	Equipment Type	Equipment I.D.	Equipment Type	Equipment I.D.
Control Box DGM (1)	CAT 7.993	Horiba PG-350E	CAT 39.25	Digital Manometer (1)	CAT 3.228
Control Box DGM (2)	-	Horiba PG-250 SRM	-	Digital Manometer (2)	CAT 3.177
Box Thermocouples (1)	CAT 3.300	Servomex 5200 MP	-	Digital Temperature Meter	CAT 3.228
Box Thermocouples (2)	-	Eco Physics CLD 822Mh	-	Stopwatch	-
Umbilical (1)	CAT 3.38	ABB AO2020-URAS26	-	Barometer	CAT 13.46
Umbilical (2)	-	Testo 350 XL	-	Stack Thermocouple (1)	CAT 4.1661
Oven Box (1)	CAT 12.79	JCT JCC P1 Cooler	CAT 4.44	Stack Thermocouple (2)	CAT 4.1707
Oven Box (2)	-	Gasmeter DX4000	-	Stack Thermocouple (3)	-
Heated Probe (1)	-	Gasmeter Sampling System	-	1m Heated Line (1)	-
Heated Probe (2)	CAT 5.176	Sick 3006	CAT 8.13	1m Heated Line (2)	-
Heated Probe (3)	-	M&C PSS	-	1m Heated Line (3)	-
S-Pitot (1)	-	Mass Flow Controller (1)	CAT 6.34	5m Heated Line (1)	-
S-Pitot (2)	-	Mass Flow Controller (2)	CAT 6.35	15m Heated Line (1)	-
L-Pitot	CAT 21P.243	Mass View (1)	CAT 25.13	20m Heated Line (1)	-
Site Balance	CAT 17.111	Mass View (2)	CAT 25.14	20m Heated Line (2)	-
500g / 1Kg Check Weights	CAT 17.111	Hioki 5043 (V)	CAT 11.99	Dual Channel Heater Controller	-
Last Impinger Arm	CAT 4.1130	Hioki 5043 (V)	-	Single Channel Heater Controller	-
Callipers	CAT 23.50	Bioaerosols Temperature Logger	-	Laboratory Balance	CAT 1.18, 1.18a, 1.18b
Tubes Kit Thermocouple	-	Electronic Refrigerator	-	Tape Measure	CAT 16.22

METHODS & TECHNICAL PROCEDURES USED

Parameter	Standard	Technical Procedure
Total Particulate Matter	EN 13284-1	MD 001
Sulphur Dioxide	EN 14791	MD 009
Water Vapour	EN 14790	MD 005
Total VOCs (as Carbon)	EN 12619:2013	MD 020
Oxides of Nitrogen (as NO ₂)	EN 14792	MD 039
Carbon Monoxide	EN 15058	MD 039
Oxygen	EN 14789	MD 039
Velocity & Vol. Flow Rate	EN 16911-1 (MID)	MD 041

PRELIMINARY STACK SURVEY: CALCULATIONS

General Stack Details

Stack Details (from Traverse)	Units	Value
Stack Diameter / Depth, D	m	0.35
Stack Width, W	m	-
Stack Area, A	m ²	0.10
Average Stack Gas Temperature, T _a	°C	160.0
Average Stack Gas Pressure	mmH ₂ O	55.6
Average Stack Static Pressure, P _{static}	kPa	0.021
Average Barometric Pressure, P _b	kPa	101.9
Average Pitot Tube Calibration Coefficient, C _p	-	0.84

Stack Gas Composition & Molecular Weights

Component	Conc ppm	Conc Dry % v/v	Conc Wet % v/v	Volume Fraction r	Molar Mass M	Density kg/m ³ p	Conc kg/m ³ p _i
CO ₂ (Estimated)	-	1.00	0.94	0.0100	44.01	1.9635	0.01964
O ₂	-	9.72	9.14	0.0972	32.00	1.4277	0.13879
N ₂	-	89.28	83.96	0.8928	28.01	1.2498	1.11584
Moisture (H ₂ O)	-	-	5.96	0.0596	18.02	0.8037	0.04791

Where: $p = M / 22.41$

$p_i = r \times p$

Calculation of Stack Gas Densities

Determinand	Units	Result
Dry Density (STP), P _{STD}	kg/m ³	1.274
Wet Density (STP), P _{STW}	kg/m ³	1.246
Dry Density (Actual), P _{Actual}	kg/m ³	0.808
Average Wet Density (Actual), P _{ActualW}	kg/m ³	0.791

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

P_{STW} = sum of all wet concentrations / 100 x density, kg/m³ (including water vapour)

$P_{Actual} = P_{STD} \times (T_{STP} / (P_{STP})) \times ((P_{static} + P_b) / T_a)$

$P_{ActualW} \text{ (at each sampling point)} = P_{STW} \times (T_s / P_s) \times (P_a / T_a)$

Calculation of Stack Gas Volumetric Flowrate, Q

Duct gas flow conditions	Units	Actual	REF ¹
Temperature	°C	160.0	0.0
Total Pressure	kPa	101.9	101.3
Moisture	%	5.96	0.00

Gas Volumetric Flowrate (from Traverse)	Units	Result
Gas Volumetric Flowrate (Actual)	m ³ /hr	10759
Gas Volumetric Flowrate (STP, Wet)	m ³ /hr	6825
Gas Volumetric Flowrate (STP, Dry)	m ³ /hr	6418
Gas Volumetric Flowrate REF ¹	m ³ /hr	6418

PRELIMINARY STACK SURVEY: VELOCITY TRAVERSE TO EN 16911-1 (MID)

(1 of 1)

Parameter	Units	Value
Date of Survey	-	20/11/2025
Time of Survey	-	10:20 - 10:25
Atmospheric Pressure	kPa	101.9
Average Stack Static Pressure	Pa	21
Result of Pitot Stagnation Test	-	Pass
Are Water Droplets Present?	-	No
Device Used	S-Type Pitot with Liquid Incline Manometer	

Parameter	Units	Value
Initial Pitot Leak Check	-	Pass
Final Pitot Leak Check	-	Pass
Orientation of Duct	-	Vertical
Pitot Tube, C_p	-	0.84
Number of Lines Available	-	1
Number of Lines Used	-	1

Sampling Line A						
Traverse Point	Depth m	ΔP mmH ₂ O	Temp °C	Wet Density kg/m ³	Velocity m/s	Swirl °
STATIC (Units: Pa)		21.0				
Mean		55.6	160.0	0.791	31.06	
1	0.18	55.6	160.0	0.791	31.06	2.0

PRELIMINARY STACK SURVEY: VELOCITY TRAVERSE TO EN 16911-1 (MID) - MEASUREMENT UNCERTAINTY

(1 of 1)

Performance characteristics (Uncertainty Components)	Uncertainty	Value	Units
Standard Uncertainty on the coefficient of the Pitot Tube	$u(k)$	0.005	-
Standard Uncertainty associated with the mean local dynamic pressures	$u(\Delta p_i)$	9.653	Pa
- Resolution	$u(res)$	0.52154	
- Calibration	$u(cal)$	30.956	
- Drift	$u(drift)$	1.096	
- Lack of Fit	$u(fit)$	59.606	
- Overall corrections to dynamic measurements	$u(C_f)$	92.180	
Standard uncertainty associated with the molar mass of the gas	$u(M)$	0.00003	-
- $\phi O_2, w$	-	9.142	
- $\phi CO_2, w$	-	0.940	
- Oxygen, dry	$u(\phi O_2, d)$	0.298	
- Carbon Dioxide, dry	$u(\phi CO_2, d)$	0.031	
- Water Vapour	$u(\phi H_2O)$	0.304	
- Oxygen, wet	$u(\phi O_2, w)$	0.281	
- Carbon Dioxide, wet	$u(\phi CO_2, w)$	0.029	
Standard uncertainty associated with the stack temperature	$u(T_c)$	2.209	K
Standard uncertainty associated with the absolute pressure in the duct	$u(p_c)$	175.957	Pa
- Atmospheric Pressure	$u(p_{atm})$	175.692	
- Static Pressure	$u(p_{stat})$	9.653	
Standard uncertainty associated with the density in the duct	$u(\rho)$	0.00436	-
Standard uncertainty associated with the local velocities	$u(v_i)$	2.735	Pa
Standard uncertainty associated with the mean velocity	$u(\bar{v})$	2.735	m/s
Standard uncertainty associated with the mean velocity (95% Confidence)	$U_c(v)$	5.362	m/s
Standard uncertainty associated with the mean velocity (95% Confidence), relative	$U_{c,rel}(v)$	17.26	%
Standard uncertainty associated with the volume flow rate (95% Confidence)	$U_c(qV, w)$	1919.8	m ³ /hr
- $u^2(a)/a^2$	-	0.00053	
- $u^2(qV, w)/q^2V, w$	-	0.00829	
- $u^2(qV, w)$	-	959411	
- $u(qV, w)$	-	979.5	
Standard uncertainty associated with the volume flow rate (95% Confidence), relative	$U_{c,rel}(qV, w)$	17.84	%

TOTAL PARTICULATE MATTER: RESULTS SUMMARY

H Westons & Sons Ltd, Ledbury
3.5kW Big Boiler

Sample Runs

Parameter	Units	Run 1	Mean
Concentration	mg/m ³	3.1	3.1
Uncertainty	±mg/m ³	0.38	0.38
Mass Emission	g/hr	5.8	5.8
Uncertainty	±g/hr	1.3	1.3

Parameter	Units	Run 1	Mean
Water Vapour	% v/v	5.96	5.96
Uncertainty	±% v/v	0.29	0.29

Blank Runs

Parameter	Units	Blank 1	Maximum
Concentration	mg/m ³	0.18	0.18

General Sampling Information

Parameter	Value	
Standard	EN 13284-1	
Technical Procedure	MD 001	
Probe Material	Titanium	
Filter Housing Material	Titanium	
Positioning of Filter	In Stack	
Filter Size and Material	47mm Glass Fibre	
Number of Sampling Lines Used	1 / 1	FORMAT: Number Used / Number Required
Number of Sampling Points Used	1 / 1	FORMAT: Number Used / Number Required
Sample Point I.D.'s	A1	

Reference Conditions

Reference Conditions are: 273K, 101.3kPa, dry gas.

TOTAL PARTICULATE MATTER: ISOKINETIC SAMPLING CALCULATIONS

Test	Units	Run 1	
Absolute pressure of stack gas, P_s			
Barometric pressure, P_b	mmHg	753.1	
Stack static pressure, P_{static}	mmH ₂ O	-11.7	
$P_s = (P_b + (P_{static} / 13.6))$	mmHg	752.2	
Volume of water vapour collected, V_{wstd}			
Total mass collected in impingers (liquid trap)	g	56.0	
Total mass collected in impingers (silica trap)	g	24.8	
Total mass of liquid collected, V_{lc}	g	80.8	
$V_{wstd} = (0.001246)(V_{lc})$	m ³	0.1007	
Volume of gas metered dry, V_{mstd}			
Volume of gas sample through gas meter, V_m	m ³	1.5925	
Gas meter correction factor, Y_d	-	1.0350	
Average dry gas meter temperature, T_m	°C	9.3	
Average pressure drop across orifice, ΔH	mmH ₂ O	59.6	
$V_{mstd} = ((0.3592)(V_m)(P_b + (\Delta H/13.6))(Y_d)) / (T_m + 273)$	m ³	1.5883	
Moisture content, B_{wo} & R_{wv}			
$B_{wo} = V_{wstd} / (V_{mstd} + V_{wstd})$	m ³	0.0596	
B_{wo} as a percentage	% v/v	5.96	
Reported Water Vapour, checked with Tables in EN 14790, R_{wv}	% v/v	5.96	
Volume of gas metered wet, V_{mstw}			
$V_{mstw} = (V_{mstd})(100/(100 - R_{wv}))$	m ³	1.6890	
Volume of gas metered at Oxygen Reference Conditions, $V_{mstd@X\%O_2}$ & $V_{mstw@X\%O_2}$			
IED & Incinerates Hazardous Material? (Yes = no positive O ₂ correction)	-	No	
% wet oxygen measured in gas stream, ACT%O _{2w}	% v/v	N/A	
% dry oxygen measured in gas stream, ACT%O _{2d}	% v/v	N/A	
% oxygen reference condition, REF%O ₂	% v/v	N/A	
O ₂ Reference Factor wet ($O_{2REFw} = (21 - REF\%O_2) / (21 - ACT\%O_{2w})$)	-	N/A	
O ₂ Reference Factor dry ($O_{2REFd} = (21 - REF\%O_2) / (21 - ACT\%O_{2d})$)	-	N/A	
$V_{mstw@X\%oxygen} = (V_{mstw}) / (O_{2REFw})$	m ³	N/A	
$V_{mstd@X\%oxygen} = (V_{mstd}) / (O_{2REFd})$	m ³	N/A	
Molecular weight of dry gas stream, M_d			
CO ₂ (Estimated)	% v/v	0.06	
O ₂	% v/v	20.80	
Total	% v/v	20.86	
N ₂	% v/v	79.14	
$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2)$	g/gmol	28.84	
Molecular weight of stack gas (wet), M_s			
$M_s = M_d(1 - (R_{wv}/100)) + 18(R_{wv}/100)$	g/gmol	28.20	
Velocity of stack gas, V_s			
Pitot tube velocity constant, K_p	-	34.97	
Velocity pressure coefficient, C_p	-	0.84	
Average of velocity heads, ΔP_{avg}	mmH ₂ O	4.87	
Average square root of velocity heads, $\sqrt{\Delta P}$	√mmH ₂ O	2.21	
Average stack gas temperature, T_s	°C	154.9	
$V_s = ((K_p)(C_p)(\sqrt{\Delta P})(T_s + 273)) / (V(M_s)(P_s))$	m/s	9.18	
Total flow of stack gas: Actual (Q_a), Wet (Q_{stw}), Dry (Q_{std}), Wet@O_{2REF} (Q_{stwO_2}), Dry@O_{2REF} (Q_{stdO_2})			
Area of stack, A_s	m ²	0.10	
$Q_a = (60)(A_s)(V_s)$	m ³ /min	53.0	
Conversion factor (K/mm.Hg), C_f	-	0.3592	
$Q_{stw} = ((Q_a)(P_s)(C_f)) / ((T_s) + 273)$	m ³ /min	33.5	
$Q_{std} = ((Q_a)(P_s)(C_f)(1 - (R_{wv}/100))) / ((T_s) + 273)$	m ³ /min	31.5	
$Q_{stwO_2} = ((Q_a)(P_s)(C_f)) / ((T_s) + 273) / (O_{2REFw})$	m ³ /min	N/A	
$Q_{stdO_2} = ((Q_a)(P_s)(C_f)(1 - (R_{wv}/100))) / ((T_s) + 273) / (O_{2REFd})$	m ³ /min	N/A	
Percent isokinetic, %I			
Nozzle diameter, D_n	mm	9.93	
Nozzle area, A_n	mm ²	77.39	
Total sampling time, q	min	60	
$\%I = (4.6398E^6)(T_s + 273)(V_{mstd}) / (P_s)(V_s)(A_n)(q)(1 - (R_{wv}/100))$	%	104.6	

TOTAL PARTICULATE MATTER: SAMPLING DETAILS

Sample Runs

Parameter	Units	Run 1
Sampling Times	-	10:47 - 11:47
Sampling Dates	-	20/11/2025
Sampling Device	-	ISO
Volume Sampled (REF)	m ³	1.5883
Filter I.D. Number	-	47-123829
Start Filter Mass	g	0.15285
End Filter Mass	g	0.15717
Total Mass on Filter	g	0.00432
Probe Rinse I.D. Number	-	PR-47-123829
Start Probe Rinse Mass	g	2.87141
End Probe Rinse Mass	g	2.87200
Total Mass in Probe Rinse	g	0.00059
Total Mass Collected	mg	4.91
Calculated Concentration	mg/m ³	3.09
Balance Uncertainty / LOD	mg/m ³	0.14

Where: ISO stands for Manual Isokinetic Sampling Train

Blank Runs

Parameter	Units	Blank 1
Blank Dates	-	20/09/2025
Average Volume Sampled (REF)	m ³	1.5883
Filter I.D. Number	-	47-123823
Start Filter Mass	g	0.15087
End Filter Mass	g	0.15096
Total Mass on Filter	g	0.00009
Probe Rinse I.D. Number	-	PR-47-123823
Start Probe Rinse Mass	g	2.79727
End Probe Rinse Mass	g	2.79746
Total Mass in Probe Rinse	g	0.00020
Total Mass Collected	mg	0.29
Calculated Concentration	mg/m ³	0.18
Balance Uncertainty / LOD	mg/m ³	0.14

TOTAL PARTICULATE MATTER: QUALITY ASSURANCE

(PAGE 1 OF 2)

Sample Runs

Leak Test Results	Units	Run 1	
Mean Sampling Rate	l/min	27.5	
Pre-Sampling Leak Rate	l/min	0.10	
Post-Sampling Leak Rate	l/min		
Allowable Leak Rate	l/min	0.30	
Leak Test Acceptable	-	Yes	

Water Droplets	Units	Run 1	
Are Water Droplets Present	-	No	

MU (Concurrent Water Vapour)	Units	Run 1	
Measurement Uncertainty (MU)	%	4.8	
Allowable MU	%	20.0	
MU Acceptable	%	Yes	

Silica Gel (Concurrent Water Vapour)	Units	Run 1	
Less than 50% Faded	%	Yes	

Isokinetic Criterion Compliance	Units	Run 1	
Isokinetic Variation	%	104.6	
Allowable Isokinetic Range	%	95 - 115	
Isokineticity Acceptable	-	Yes	

Weighing Uncertainty Criteria	Units	Run 1	
Overall Weighing Uncertainty	± mg	0.33	
Overall Weighing Uncertainty	± mg/m ³	0.20	
ELV [Daily ELV for IED]	mg/m ³	5.00	
Allowable Weighing Uncertainty	mg/m ³	0.25	
Weighing Uncertainty Acceptable	-	Yes	

Filter Temperatures	Units	Run 1	
Pre-Conditioning Temperature	°C	180	
Post-Conditioning Temperature	°C	160	
Maximum Filter Temperature	°C	159	

Test Conditions	Units	Run 1	
Ambient Temperature Recorded?	-	Yes	

TOTAL PARTICULATE MATTER: QUALITY ASSURANCE

(PAGE 2 OF 2)

Blank Runs

Leak Test Results	Units	Blank 1	
Expected Sampling Rate	l/min	15.0	
Pre-Sampling Leak Rate	l/min	0.10	
Post-Sampling Leak Rate	l/min		
Allowable Leak Rate	l/min	0.30	
Leak Test Acceptable	-	Yes	

Validity of Blank vs ELV	Units	Blank 1	
Allowable Blank	mg/m ³	0.5	
Blank Acceptable	-	Yes	

Acetone / Water Rinse Blank	Units	Blank
Acetone / Water Rinse Value	mg/l	2.7
Allowable Blank	mg/l	10
Blank Acceptable	-	Yes

Method Deviations

Nature of Deviation	Run Number	
(x = deviation applies to the associated run, wx = deviation also applies to the concurrent water vapour run)	1	
There are no deviations associated with the sampling employed.	wx	

TOTAL PARTICULATE MATTER: MEASUREMENT UNCERTAINTY CALCULATIONS

Measured Quantities	Value		Standard uncertainty		
	Symbol	Run 1	Symbol	Units	Run 1
Sampled Volume (Actual)	V_m	1.5925	uV_m	m ³	0.0319
Sampled Gas Temperature	T_m	282.3	uT_m	K	2.00
Sampled Gas Pressure	p_m	100.3	up_m	kPa	0.50
Sampled Gas Humidity	H_m	0.00	uH_m	% v/v	1.00
Leak	L	0.36	uL	%	-
Mass of Particulate	m	4.91	um	mg	0.23
Uncollected Mass	UCM	0.29	uUCM	mg	-

Uncertainty as a Percentage			
Measured Quantities	Units	Run 1	Requirement of Standard
Sampled Volume (Actual)	%	2.00	≤2%
Sampled Gas Temperature	%	0.71	≤1%
Sampled Gas Pressure	%	0.50	≤1%
Sampled Gas Humidity	%	1.00	≤1%
Leak	%	0.36	≤2%
Mass of Particulate	%	2.90	-
Uncollected Mass	%	-	-

Uncertainty in Measurement Units				Sensitivity Coefficient	
Measured Quantities	Symbol	Units	Run 1	Run 1	
Sampled Volume (STP)	V_m	m ³	1.5883	1.95	
Leak	L	mg/m ³	0.007	1.00	
Mass of Particulate	L_r	mg	4.913	0.63	
Uncollected Mass	UCM	mg	0.17	0.63	

Uncertainty in Result		
Measured Quantities	Units	Run 1
Sampled Volume (STP)	mg/m ³	0.074
Leak	mg/m ³	0.0065
Mass of Particulate	mg/m ³	0.1448
Uncollected Mass	mg/m ³	0.1042

Oxygen Correction Part of MU Budget		
Measured Quantities	Units	Run 1
O ₂ Correction Factor	-	N/A
Stack Gas O ₂ Content	% v/v	N/A
MU for O ₂ Correction	-	N/A
Overall MU For O ₂ Measurement	%	N/A

Parameter	Units	Run 1
Combined uncertainty	mg/m ³	0.19
Expanded uncertainty (95% confidence), without Oxygen Correction	mg/m ³	0.38
Expanded uncertainty (95% confidence), with Oxygen Correction	mg/m ³	N/A
Expanded uncertainty (95% confidence), estimated with Method Deviations	mg/m ³	0.38
Reported Uncertainty	mg/m ³	0.38
Expanded uncertainty (95% confidence), without Oxygen Correction	%	12.3
Expanded uncertainty (95% confidence), with Oxygen Correction	%	N/A
Expanded uncertainty (95% confidence), estimated with Method Deviations	%	12.3
Reported Uncertainty	%	12.3
Reported Uncertainty as % of ELV	%	7.6

SULPHUR DIOXIDE: RESULTS SUMMARY

H Westons & Sons Ltd, Ledbury
3.5kW Big Boiler

Sample Runs

Parameter	Units	Run 1	Mean
Concentration	mg/m ³	52.6	52.6
Uncertainty	±mg/m ³	2.7	2.7
Mass Emission	g/hr	99.4	99.4
Uncertainty	±g/hr	18.4	18.4

Parameter	Units	Run 1	Mean
Water Vapour	% v/v	5.96	5.96
Uncertainty	±% v/v	0.29	0.29

Blank Runs

Parameter	Units	Blank 1	Maximum
Concentration	mg/m ³	0.03	0.03

General Sampling Information

Parameter	Value
Standard	EN 14791
Technical Procedure	MD 009
Name of Analytical Laboratory	EET
Analytical Laboratory's Procedure	MD-101
ISO 17025 Accredited Analysis?	MCERTS
Date of Sample Analysis	28/11/2025
Probe Material	Titanium
Filter Housing Material	Titanium
Impinger Material	Polyethylene
Absorption Solution	0.3% Hydrogen Peroxide
Positioning of Filter	In Stack
Filter Size and Material	47mm Glass Fibre
Number of Sampling Lines Used	1 / 1
Number of Sampling Points Used	1 / 1
Sample Point I.D.'s	A1

FORMAT: Number Used / Number Required

FORMAT: Number Used / Number Required

Reference Conditions

Reference Conditions are: 273K, 101.3kPa, dry gas.

SULPHUR DIOXIDE: ISOKINETIC SAMPLING CALCULATIONS

Test	Units	Run 1	
Absolute pressure of stack gas, P_s			
Barometric pressure, P_b	mmHg	753.1	
Stack static pressure, P_{static}	mmH ₂ O	-11.7	
$P_s = (P_b + (P_{static} / 13.6))$	mmHg	752.2	
Volume of water vapour collected, V_{wstd}			
Total mass collected in impingers (liquid trap)	g	56.0	
Total mass collected in impingers (silica trap)	g	24.8	
Total mass of liquid collected, V_{lc}	g	80.8	
$V_{wstd} = (0.001246)(V_{lc})$	m ³	0.1007	
Volume of gas metered dry, V_{mstd}			
Volume of gas sample through gas meter, V_m	m ³	1.5925	
Gas meter correction factor, Y_d	-	1.0350	
Average dry gas meter temperature, T_m	°C	9.3	
Average pressure drop across orifice, ΔH	mmH ₂ O	59.6	
$V_{mstd} = ((0.3592)(V_m)(P_b + (\Delta H/13.6))(Y_d)) / (T_m + 273)$	m ³	1.5883	
Moisture content, B_{wo} & R_{wv}			
$B_{wo} = V_{wstd} / (V_{mstd} + V_{wstd})$	m ³	0.0596	
B_{wo} as a percentage	% v/v	5.96	
Reported Water Vapour, checked with Tables in EN 14790, R_{wv}	% v/v	5.96	
Volume of gas metered wet, V_{mstw}			
$V_{mstw} = (V_{mstd})(100/(100 - R_{wv}))$	m ³	1.6890	
Volume of gas metered at Oxygen Reference Conditions, $V_{mstd@X\%O_2}$ & $V_{mstw@X\%O_2}$			
IED & Incinerates Hazardous Material? (Yes = no positive O ₂ correction)	-	No	
% wet oxygen measured in gas stream, ACT%O _{2w}	% v/v	N/A	
% dry oxygen measured in gas stream, ACT%O _{2d}	% v/v	N/A	
% oxygen reference condition, REF%O ₂	% v/v	N/A	
O ₂ Reference Factor wet ($O_{2REFW} = (21 - REF\%O_2) / (21 - ACT\%O_{2w})$)	-	N/A	
O ₂ Reference Factor dry ($O_{2REFD} = (21 - REF\%O_2) / (21 - ACT\%O_{2d})$)	-	N/A	
$V_{mstw@X\%oxygen} = (V_{mstw}) / (O_{2REFW})$	m ³	N/A	
$V_{mstd@X\%oxygen} = (V_{mstd}) / (O_{2REFD})$	m ³	N/A	
Molecular weight of dry gas stream, M_d			
CO ₂ (Estimated)	% v/v	0.06	
O ₂	% v/v	20.80	
Total	% v/v	20.86	
N ₂	% v/v	79.14	
$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2)$	g/gmol	28.84	
Molecular weight of stack gas (wet), M_s			
$M_s = M_d(1 - (R_{wv}/100)) + 18(R_{wv}/100)$	g/gmol	28.20	
Velocity of stack gas, V_s			
Pitot tube velocity constant, K_p	-	34.97	
Velocity pressure coefficient, C_p	-	0.84	
Average of velocity heads, ΔP_{avg}	mmH ₂ O	4.87	
Average square root of velocity heads, $\sqrt{\Delta P}$	√mmH ₂ O	2.21	
Average stack gas temperature, T_s	°C	154.9	
$V_s = ((K_p)(C_p)(\sqrt{\Delta P})(T_s + 273)) / (V(M_s)(P_s))$	m/s	9.18	
Total flow of stack gas: Actual (Q_a), Wet (Q_{stw}), Dry (Q_{std}), Wet@O_{2REF} (Q_{stwO_2}), Dry@O_{2REF} (Q_{stdO_2})			
Area of stack, A_s	m ²	0.10	
$Q_a = (60)(A_s)(V_s)$	m ³ /min	53.0	
Conversion factor (K/mm.Hg), C_f	-	0.3592	
$Q_{stw} = ((Q_a)(P_s)(C_f)) / ((T_s) + 273)$	m ³ /min	33.5	
$Q_{std} = ((Q_a)(P_s)(C_f)(1 - (R_{wv}/100))) / ((T_s) + 273)$	m ³ /min	31.5	
$Q_{stwO_2} = ((Q_a)(P_s)(C_f)) / ((T_s) + 273) / (O_{2REFW})$	m ³ /min	N/A	
$Q_{stdO_2} = ((Q_a)(P_s)(C_f)(1 - (R_{wv}/100))) / ((T_s) + 273) / (O_{2REFD})$	m ³ /min	N/A	
Percent isokinetic, %I			
Nozzle diameter, D_n	mm	9.93	
Nozzle area, A_n	mm ²	77.39	
Total sampling time, q	min	60	
$\%I = (4.6398E^6)(T_s + 273)(V_{mstd}) / (P_s)(V_s)(A_n)(q)(1 - (R_{wv}/100))$	%	104.6	

SULPHUR DIOXIDE: SAMPLING DETAILS

Sample Runs

Parameter	Units	Run 1	
Sampling Times	-	10:47 - 11:47	
Sampling Dates	-	20/11/2025	
Sampling Device	-	ISO	
Volume Sampled (REF)	m ³	1.5883	
Laboratory Result for Front Impingers	µg/ml	367.56	
Laboratory Result for Back Impinger	µg/ml	4.57	
Volume in Front Impingers	ml	226.0	
Volume in Back Impinger	ml	117.2	
Mass in Front Impingers	µg	83068.6	
Mass in Back Impinger	µg	535.6	
Total Mass Collected	µg	83604.2	
Calculated Concentration	mg/m ³	52.64	

Where: ISO stands for Manual Isokinetic Sampling Train

Blank Runs

Parameter	Units	Blank 1	
Blank Dates	-	20/09/2025	
Average Volume Sampled (REF)	m ³	1.5883	
Laboratory Result for Impingers	µg/ml	0.15	
Volume in Impingers	ml	312.9	
Total Mass Collected	µg	46.9	
Calculated Concentration	mg/m ³	0.03	

SULPHUR DIOXIDE: QUALITY ASSURANCE

(PAGE 1 OF 2)

Sample Runs

Leak Test Results	Units	Run 1	
Mean Sampling Rate	l/min	27.5	
Pre-Sampling Leak Rate	l/min	0.10	
Post-Sampling Leak Rate	l/min	N/A	
Allowable Leak Rate	l/min	0.30	
Leak Test Acceptable	-	Yes	

Absorption Efficiency	Units	Run 1	
Absorption Efficiency	%	99.4	
Allowable Absorption Efficiency	%	95	
Absorption Efficiency Acceptable	-	Yes	

Water Droplets	Units	Run 1	
Are Water Droplets Present	-	No	

MU (Concurrent Water Vapour)	Units	Run 1	
Measurement Uncertainty (MU)	%	4.8	
Allowable MU	%	20.0	
MU Acceptable	%	Yes	

Silica Gel (Concurrent Water Vapour)	Units	Run 1	
Less than 50% Faded	%	Yes	

Isokinetic Criterion Compliance	Units	Run 1	
Isokinetic Variation	%	104.6	
Allowable Isokinetic Range	%	95 - 115	
Isokineticity Acceptable	-	Yes	

Filter Temperatures	Units	Run 1	
Maximum Filter Temperature	°C	159	

Test Conditions	Units	Run 1	
Ambient Temperature Recorded?	-	Yes	

SULPHUR DIOXIDE: QUALITY ASSURANCE

(PAGE 2 OF 2)

Blank Runs

Leak Test Results	Units	Blank 1	
Expected Sampling Rate	l/min	15.0	
Pre-Sampling Leak Rate	l/min	0.10	
Post-Sampling Leak Rate	l/min		
Allowable Leak Rate	l/min	0.30	
Leak Test Acceptable	-	Yes	
Validity of Blank vs ELV	Units	Blank 1	
Allowable Blank	mg/m ³	N/A	
Blank Acceptable	-	N/A	

Method Deviations

Nature of Deviation	Run Number
(x = deviation applies to the associated run, wx = deviation also applies to the concurrent water vapour run)	1
There are no deviations associated with the sampling employed.	

SULPHUR DIOXIDE: MEASUREMENT UNCERTAINTY CALCULATIONS

Measured Quantities	Value		Standard uncertainty		
	Symbol	Run 1	Symbol	Units	Run 1
Sampled Volume (Actual)	V_m	1.5925	uV_m	m^3	0.0319
Sampled Gas Temperature	T_m	282.3	uT_m	K	2.00
Sampled Gas Pressure	p_m	100.3	up_m	kPa	0.50
Sampled Gas Humidity	H_m	0.00	uH_m	% v/v	1.00
Leak	L	0.36	uL	%	-
Laboratory Result	L_r	0.90	uL_r	%	-

Uncertainty as a Percentage				Requirement of Standard
Measured Quantities	Units	Run 1		
Sampled Volume (Actual)	%	2.00		$\leq 2\%$
Sampled Gas Temperature	%	0.71		$\leq 1\%$
Sampled Gas Pressure	%	0.50		$\leq 1\%$
Sampled Gas Humidity	%	1.00		$\leq 1\%$
Leak	%	0.36		$\leq 2\%$
Laboratory Result	%	0.90		No Requirement

Uncertainty in Measurement Units				Sensitivity Coefficient	
Measured Quantities	Symbol	Units	Run 1	Run 1	
Sampled Volume (STP)	V_m	m^3	1.5883	33.14	
Leak	L	mg/ m^3	0.111	1.00	
Laboratory Result	L_r	mg/ m^3	0.474	1.00	

Uncertainty in Result		
Measured Quantities	Units	Run 1
Sampled Volume (STP)	mg/ m^3	1.264
Leak	mg/ m^3	0.1106
Laboratory Result	mg/ m^3	0.4737

Oxygen Correction Part of MU Budget		
Measured Quantities	Units	Run 1
O ₂ Correction Factor	-	N/A
Stack Gas O ₂ Content	% v/v	N/A
MU for O ₂ Correction	-	N/A
Overall MU For O ₂ Measurement	%	N/A

Parameter	Units	Run 1
Combined uncertainty	mg/ m^3	1.35
Expanded uncertainty (95% confidence), without Oxygen Correction	mg/ m^3	2.66
Expanded uncertainty (95% confidence), with Oxygen Correction	mg/ m^3	N/A
Expanded uncertainty (95% confidence), estimated with Method Deviations	mg/ m^3	2.66
Reported Uncertainty	mg/ m^3	2.66
Expanded uncertainty (95% confidence), without Oxygen Correction	%	5.0
Expanded uncertainty (95% confidence), with Oxygen Correction	%	N/A
Expanded uncertainty (95% confidence), estimated with Method Deviations	%	5.0
Reported Uncertainty	%	5.0
Reported Uncertainty as % of ELV	%	N/A

TOTAL VOCs (as CARBON): RESULTS SUMMARY

H Westons & Sons Ltd, Ledbury
3.5kW Big Boiler

Sample Runs

Parameter	Units	Run 1	Mean
Concentration	mg/m ³	1.5	1.5
Uncertainty	±mg/m ³	1.0	1.0
Mass Emission	g/hr	2.8	2.8
Uncertainty	±g/hr	2.0	2.0

General Sampling Information

Parameter	Value
Standard	EN 12619:2013
Technical Procedure	MD 020
Probe Material	Stainless Steel
Filtration Type / Size	0.1µm Glass Fibre
Heated Head Filter Used	Yes
Heated Line Temperature	180°C
Span Gas Type	Propane in 8% O ₂ in N ₂ (5 Grade)
Span Gas Reference Number	12.0716 in N ₂ 1.0666 in AIR
Span Gas Expiry Date	17/12/2027 24/04/2030
Span Gas Start Pressure (bar)	100 100
Gas Cylinder Concentration (ppm)	82.3 80.2
Span Gas Set Point (ppm)	81.50
Span Gas Uncertainty (%)	2 2
Zero Gas Type	8% O ₂ in N ₂ (5 Grade)
Number of Sampling Lines Used	1 / 1
Number of Sampling Points Used	1 / 1
Sample Point I.D.'s	A1

This is the blended concentration of both propane cylinders

FORMAT: Number Used / Number Required

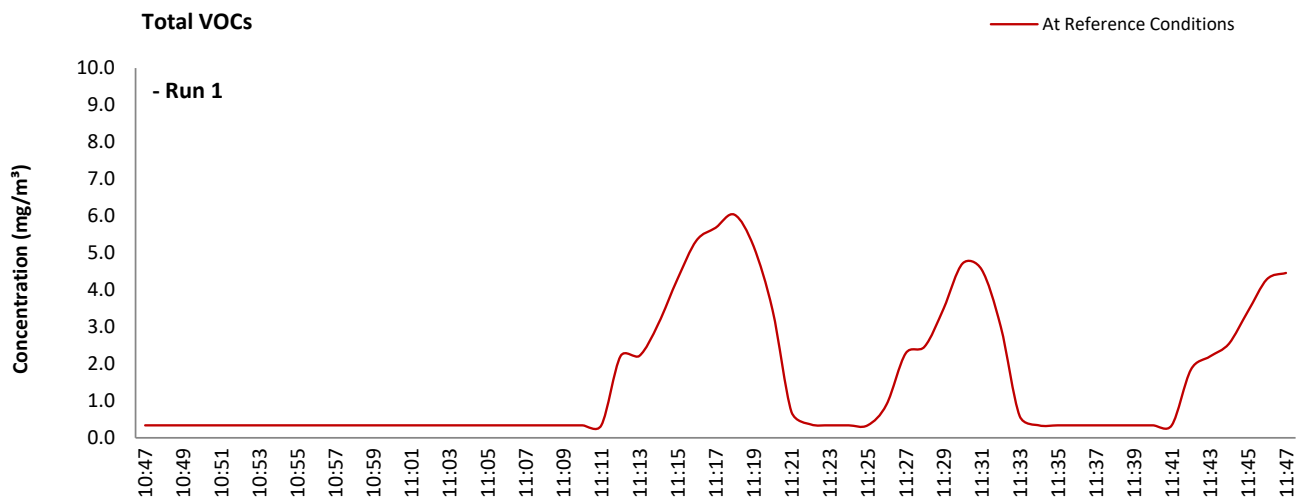
FORMAT: Number Used / Number Required

Reference Conditions

Reference Conditions are: 273K, 101.3kPa, dry gas.

TOTAL VOCs (as CARBON): DATA TREND

Graphical Trend of Data



TOTAL VOCs (as CARBON): SAMPLING DETAILS & QUALITY ASSURANCE

Sampling Details

Parameter	Units	Run 1
Sampling Times	-	10:47 - 11:47
Sampling Dates	-	20/11/2025
Instrument Range	ppm	100
Span Gas Value	ppm	81.5

Quality Assurance

Zero Drift	Units	Run 1
Zero Down Sampling Line (Pre)	ppm	0.00
Zero Down Sampling Line (Post)	ppm	-0.50
Zero Drift	ppm	-0.50
Zero Drift	%	-0.62
Drift Correction Applied	2-5%	No
Allowable Zero Drift	± ppm	4.08
Zero Drift Acceptable	-	Yes

Span Drift	Units	Run 1
Span Down Sampling Line (Pre)	ppm	81.00
Span Down Sampling Line (Post)	ppm	79.50
Span Drift	ppm	-1.50
Span Drift	%	-1.85
Drift Correction Applied	2-5%	No
Allowable Span Drift	± ppm	4.08
Span Drift Acceptable	-	Yes

Test Conditions	Units	Run 1
Run Ambient Temperature Range	°C	8 - 5

Method Deviations

Nature of Deviation	Run Number
(x = deviation applies to the associated run)	1
There are no deviations associated with the sampling employed.	x

TOTAL VOCs (as CARBON): MEASUREMENT UNCERTAINTY CALCULATIONS

Performance characteristics	RUN 1	Units
Limit value	-	mg/m ³ (REF)
Allowable MU	15.0	%
Measured concentration	1.50	mg/m ³ (STP, dry)
Range Used	100.0	ppm
Range Used [A]	160.6	mg/m ³
Cal gas conc.	81.5	ppm
Conversion	1.61	ppm to mg/m ³
MCERTS Range [B]	15.0	mg/m ³
Lower of [A] or [B]	15.0	mg/m ³
Cal gas conc.	130.9	mg/m ³

Performance characteristics	RUN 1	Units
Response time	45	seconds
Number of readings in measurement	60	-
Repeatability at zero	2.00	% full scale
Repeatability at span level	0.00	% full scale
Deviation from linearity	0.07	% of value
Zero drift	-0.62	% full scale
Span drift	-1.85	% full scale
Volume or pressure flow dependence	1.60	% of full scale
Atmospheric pressure dependence	0.30	% of value/kPa
Ambient temperature dependence	1.40	% full scale/10K
Combined interference	0.45	% range
Dependence on voltage	0.50	% full scale/10V
Losses in the line (leak)	0.61	% of value
Uncertainty of calibration gas	2.83	% of value

Performance characteristic	RUN 1	Units
Standard deviation of repeatability at zero	use rep at span	mg/m ³
Standard deviation of repeatability at span level	0.00	mg/m ³
Lack of fit	0.01	mg/m ³
Drift	-0.48	mg/m ³
Volume or pressure flow dependence	0.00	mg/m ³
Atmospheric pressure dependence	0.01	mg/m ³
Ambient temperature dependence	0.20	mg/m ³
Combined interference (from MCERTS Certificate)	0.04	mg/m ³
Dependence on voltage	0.06	mg/m ³
Losses in the line (leak)	0.01	mg/m ³
Uncertainty of calibration gas	0.02	mg/m ³

Measurement uncertainty	Result	RUN 1	Units
Combined uncertainty		1.50	mg/m ³
Expanded uncertainty		0.53	mg/m ³
Expanded uncertainty	k = 1.96	1.04	mg/m ³
Uncertainty corrected to std conds. (O ₂)		1.04	mg/m ³ (REF)

	RUN 1	Units
Expanded uncertainty (no O ₂) - at 95% Confidence	68.95	% of Value
Expanded uncertainty (no O ₂) - at 95% Confidence	N/A	% at ELV
Overall Allowable uncertainty (no O ₂) - at 95% Confidence	N/A	% at ELV
Result of Compliance with Uncertainty Requirement	N/A	-

	RUN 1	Units
Expanded uncertainty (with O ₂) - at 95% Confidence	N/A	% of Value
Expanded uncertainty (with O ₂) - at 95% Confidence	N/A	% at ELV
Overall Allowable uncertainty (with O ₂) - at 95% Confidence	N/A	% at ELV
Result of Compliance with Uncertainty Requirement	N/A	-

Requirement for SRM is that Uncertainty should be <15% of the value at the ELV, on a dry gas basis, or if O₂ correction is applied less than 15% + the uncertainty associated with the O₂ correction (using sqrt of sum squares to add uncertainty components).

OXIDES OF NITROGEN (as NO₂): RESULTS SUMMARY

H Westons & Sons Ltd, Ledbury
3.5kW Big Boiler

Sample Runs

Parameter	Units	Run 1	Mean
Concentration	mg/m ³	83.1	83.1
Uncertainty	±mg/m ³	3.2	3.2
Mass Emission	g/hr	157	157
Uncertainty	±g/hr	28.7	28.7

General Sampling Information

Parameter	Value
Standard	EN 14792
Technical Procedure	MD 039
Probe Material	Stainless Steel
Filtration Type / Size	0.1µm Glass Fibre
Heated Head Filter Used	Yes
Heated Line Temperature	180°C
Date & Result of Last Converter Check	13/12/2024 - 95.5%
Span Gas Type	Nitrogen Monoxide
Span Gas Reference Number	12.0716
Span Gas Expiry Date	25/07/2027
Span Gas Start Pressure (bar)	140
Gas Cylinder Concentration (ppm)	404.9
Span Gas Uncertainty (%)	2
Zero Gas Type	Nitrogen (5 Grade)
Number of Sampling Lines Used	1 / 1
Number of Sampling Points Used	1 / 1
Sample Point I.D.'s	A1

NOTE: Dilution performed to achieve correct span value

FORMAT: Number Used / Number Required

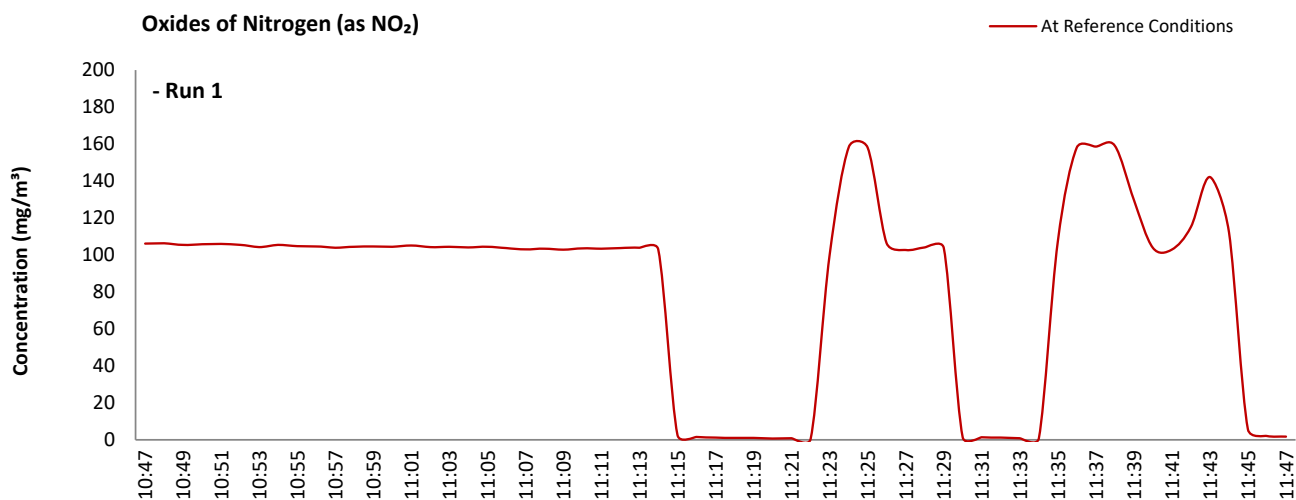
FORMAT: Number Used / Number Required

Reference Conditions

Reference Conditions are: 273K, 101.3kPa, dry gas.

OXIDES OF NITROGEN (as NO₂): DATA TREND

Graphical Trend of Data



APPENDIX 2

OXIDES OF NITROGEN (as NO₂): SAMPLING DETAILS & QUALITY ASSURANCE

Sampling Details

Parameter	Units	Run 1
Sampling Times	-	10:47 - 11:47
Sampling Dates	-	20/11/2025
Instrument Range	ppm	100
Span Gas Value	ppm	80.0

Quality Assurance

Conditioning Unit Temperature	Units	Run 1
Average Temperature	°C	2.1
Allowable Temperature	< °C	4.0
Temperature Acceptable	-	Yes

Zero Drift	Units	Run 1
Zero at Analyser (Pre)	ppm	0.00
Zero at Analyser (Post)	ppm	0.20
Zero Drift	ppm	0.20
Zero Drift	%	0.25
Drift Correction Applied	2-5%	No
Allowable Zero Drift	± %	5.00
Zero Drift Acceptable	-	Yes

Span Drift	Units	Run 1
Span at Analyser (Pre)	ppm	80.00
Span at Analyser (Post)	ppm	78.80
Span Drift	ppm	-1.20
Zero Adj. Span Drift	%	1.75
Drift Correction Applied	2-5%	No
Allowable Span Drift	± %	5.00
Span Drift Acceptable	-	Yes

Test Conditions	Units	Run 1
Run Ambient Temperature Range	°C	8 - 5

Method Deviations

Nature of Deviation	Run Number
(x = deviation applies to the associated run)	1
Lowest differential pressure < 5 Pa.	x

OXIDES OF NITROGEN (as NO₂): MEASUREMENT UNCERTAINTY CALCULATIONS

Performance characteristics	RUN 1	Units
Limit value	150.0	mg/m ³ (REF)
Allowable MU	10.0	%
Measured concentration	83.14	mg/m ³ (STP, dry)
Ratio NO / NO ₂	5	%
Range Used	100.0	ppm
Range Used [A]	205.2	mg/m ³
Cal gas conc.	80.0	ppm
Conversion	2.05	ppm to mg/m ³
MCERTS Range [B]	205.0	mg/m ³
Lower of [A] or [B]	205.0	mg/m ³
Cal gas conc.	164.2	mg/m ³

Performance characteristics	RUN 1	Units
Response time	31	seconds
Number of readings in measurement	60	-
Repeatability at zero	0.00	% full scale
Repeatability at span level	0.10	% full scale
Deviation from linearity	0.54	% of value
Zero drift	0.25	% full scale
Span drift	-1.75	% full scale
Volume or pressure flow dependence	0.10	% of full scale
Atmospheric pressure dependence	0.10	% of value/kPa
Ambient temperature dependence	0.04	% full scale/10K
Combined interference	0.63	% range
Dependence on voltage	-0.23	% full scale/10V
Converter efficiency	95.5	%
Losses in the line (leak)	0.12	% of value
Uncertainty of calibration gas blending	1.40	% of value
Uncertainty of calibration gas	2.00	% of value

Performance characteristic	RUN 1	Units
Standard deviation of repeatability at zero	use rep at span	mg/m ³
Standard deviation of repeatability at span level	0.01	mg/m ³
Lack of fit	0.64	mg/m ³
Drift	-0.60	mg/m ³
Volume or pressure flow dependence	0.00	mg/m ³
Atmospheric pressure dependence	0.06	mg/m ³
Ambient temperature dependence	0.01	mg/m ³
Combined interference (from MCERTS Certificate)	0.75	mg/m ³
Dependence on voltage	-0.03	mg/m ³
Converter efficiency	0.11	mg/m ³
Losses in the line (leak)	0.06	mg/m ³
Uncertainty of calibration gas blending	0.67	mg/m ³
Uncertainty of calibration gas	0.96	mg/m ³

Measurement uncertainty	Result	RUN 1	Units
Combined uncertainty		83.14	mg/m ³
Expanded uncertainty	k =	1.65	mg/m ³
Expanded uncertainty		3.23	mg/m ³
Uncertainty corrected to std conds. (O ₂)		3.23	mg/m ³ (REF)

	RUN 1	Units
Expanded uncertainty (no O ₂) - at 95% Confidence	3.89	% of Value
Expanded uncertainty (no O ₂) - at 95% Confidence	2.16	% at ELV
Overall Allowable uncertainty (no O ₂) - at 95% Confidence	10.0	% at ELV
Result of Compliance with Uncertainty Requirement	COMPLIANT	-

	RUN 1	Units
Expanded uncertainty (with O ₂) - at 95% Confidence	N/A	% of Value
Expanded uncertainty (with O ₂) - at 95% Confidence	N/A	% at ELV
Overall Allowable uncertainty (with O ₂) - at 95% Confidence	N/A	% at ELV
Result of Compliance with Uncertainty Requirement	N/A	-

Requirement for SRM is that Uncertainty should be <10% of the value at the ELV, on a dry gas basis, or if O₂ correction is applied less than 10% + the uncertainty associated with the O₂ correction (using sqrt of sum squares to add uncertainty components).

APPENDIX 2

CARBON MONOXIDE: RESULTS SUMMARY

H Westons & Sons Ltd, Ledbury
3.5kW Big Boiler

Sample Runs

Parameter	Units	Run 1	Mean
Concentration	mg/m ³	5.8	5.8
Uncertainty	±mg/m ³	0.76	0.76
Mass Emission	g/hr	11.0	11.0
Uncertainty	±g/hr	2.4	2.4

General Sampling Information

Parameter	Value
Standard	EN 15058
Technical Procedure	MD 039
Probe Material	Stainless Steel
Filtration Type / Size	0.1µm Glass Fibre
Heated Head Filter Used	Yes
Heated Line Temperature	180°C
Span Gas Type	Carbon Monoxide
Span Gas Reference Number	12.0716
Span Gas Expiry Date	25/07/2027
Span Gas Start Pressure (bar)	140
Gas Cylinder Concentration (ppm)	402.1
Span Gas Uncertainty (%)	2
Zero Gas Type	Nitrogen (5 Grade)
Number of Sampling Lines Used	1 / 1
Number of Sampling Points Used	1 / 1
Sample Point I.D.'s	A1

NOTE: Dilution performed to achieve correct span value

FORMAT: Number Used / Number Required

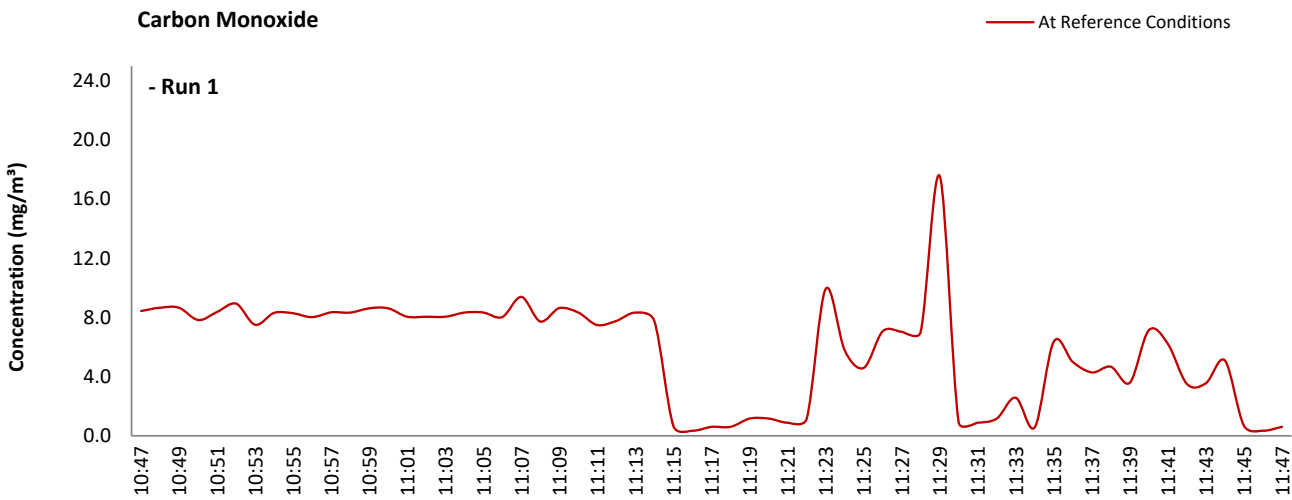
FORMAT: Number Used / Number Required

Reference Conditions

Reference Conditions are: 273K, 101.3kPa, dry gas.

CARBON MONOXIDE: DATA TREND

Graphical Trend of Data



APPENDIX 2

CARBON MONOXIDE: SAMPLING DETAILS & QUALITY ASSURANCE

Sampling Details

Parameter	Units	Run 1
Sampling Times	-	10:47 - 11:47
Sampling Dates	-	20/11/2025
Instrument Range	ppm	100
Span Gas Value	ppm	80.0

Quality Assurance

Conditioning Unit Temperature	Units	Run 1
Average Temperature	°C	2.1
Allowable Temperature	< °C	4.0
Temperature Acceptable	-	Yes

Zero Drift	Units	Run 1
Zero at Analyser (Pre)	ppm	0.00
Zero at Analyser (Post)	ppm	0.10
Zero Drift	ppm	0.10
Zero Drift	%	0.13
Drift Correction Applied	2-5%	No
Allowable Zero Drift	± %	5.00
Zero Drift Acceptable	-	Yes

Span Drift	Units	Run 1
Span at Analyser (Pre)	ppm	80.00
Span at Analyser (Post)	ppm	78.20
Span Drift	ppm	-1.80
Zero Adj. Span Drift	%	2.37
Drift Correction Applied	2-5%	Yes
Allowable Span Drift	± %	5.00
Span Drift Acceptable	-	Yes

Test Conditions	Units	Run 1
Run Ambient Temperature Range	°C	8 - 5

Method Deviations

Nature of Deviation	Run Number
(x = deviation applies to the associated run)	1
Lowest differential pressure < 5 Pa.	x

CARBON MONOXIDE: MEASUREMENT UNCERTAINTY CALCULATIONS

Performance characteristics	RUN 1	Units
Limit value	-	mg/m ³ (REF)
Allowable MU	6.0	%
Measured concentration	5.81	mg/m ³ (STP, dry)
Range Used	100.0	ppm
Range Used [A]	124.9	mg/m ³
Cal gas conc.	80.0	ppm
Conversion	1.25	ppm to mg/m ³
MCERTS Range [B]	75.0	mg/m ³
Lower of [A] or [B]	75.0	mg/m ³
Cal gas conc.	99.9	mg/m ³

Performance characteristics	RUN 1	Units
Response time	28	seconds
Number of readings in measurement	60	-
Repeatability at zero	0.10	% full scale
Repeatability at span level	0.20	% full scale
Deviation from linearity	0.69	% of value
Zero drift	0.13	% full scale
Span drift	0.00	% full scale
Volume or pressure flow dependence	0.10	% of full scale
Atmospheric pressure dependence	0.22	% of value/kPa
Ambient temperature dependence	-0.20	% full scale/10K
Combined interference	-0.48	% range
Dependence on voltage	-0.35	% full scale/10V
Losses in the line (leak)	0.00	% of value
Uncertainty of calibration gas blending	1.40	% of value
Uncertainty of calibration gas	2.00	% of value

Performance characteristic	RUN 1	Units
Standard deviation of repeatability at zero	use rep at span	mg/m ³
Standard deviation of repeatability at span level	0.03	mg/m ³
Lack of fit	0.30	mg/m ³
Drift	0.07	mg/m ³
Volume or pressure flow dependence	0.00	mg/m ³
Atmospheric pressure dependence	0.05	mg/m ³
Ambient temperature dependence	-0.03	mg/m ³
Combined interference (from MCERTS Certificate)	-0.21	mg/m ³
Dependence on voltage	-0.04	mg/m ³
Losses in the line (leak)	0.00	mg/m ³
Uncertainty of calibration gas blending	0.05	mg/m ³
Uncertainty of calibration gas	0.07	mg/m ³

Measurement uncertainty	Result	RUN 1	Units
Combined uncertainty		5.81	mg/m ³
Expanded uncertainty	k = 1.96	0.39	mg/m ³
Expanded uncertainty		0.76	mg/m ³
Uncertainty corrected to std conds. (O ₂)		0.76	mg/m ³ (REF)

	RUN 1	Units
Expanded uncertainty (no O ₂) - at 95% Confidence	13.1	% of Value
Expanded uncertainty (no O ₂) - at 95% Confidence	N/A	% at ELV
Overall Allowable uncertainty (no O ₂) - at 95% Confidence	N/A	% at ELV
Result of Compliance with Uncertainty Requirement	N/A	-

	RUN 1	Units
Expanded uncertainty (with O ₂) - at 95% Confidence	N/A	% of Value
Expanded uncertainty (with O ₂) - at 95% Confidence	N/A	% at ELV
Overall Allowable uncertainty (with O ₂) - at 95% Confidence	N/A	% at ELV
Result of Compliance with Uncertainty Requirement	N/A	-

Requirement for SRM is that Uncertainty should be <6% of the value at the ELV, on a dry gas basis, or if O₂ correction is applied less than 6% + the uncertainty associated with the O₂ correction (using sqrt of sum squares to add uncertainty components).

OXYGEN: RESULTS SUMMARY

H Westons & Sons Ltd, Ledbury
3.5kW Big Boiler

Sample Runs

Parameter	Units	Run 1	Mean
Concentration	% v/v	9.72	9.72
Uncertainty	±% v/v	0.27	0.27

General Sampling Information

Parameter	Value
Standard	EN 14789
Technical Procedure	MD 039
Probe Material	Stainless Steel
Filtration Type / Size	0.1µm Glass Fibre
Heated Head Filter Used	Yes
Heated Line Temperature	180°C
Span Gas Type	Synthetic Air (5 Grade)
Span Gas Reference Number	11.0666
Span Gas Expiry Date	08/10/2029
Span Gas Start Pressure (bar)	100
Gas Cylinder Concentration (% v/v)	21.06
Span Gas Uncertainty (%)	2
Zero Gas Type	Nitrogen (5 Grade)
Number of Sampling Lines Used	1 / 1
Number of Sampling Points Used	1 / 1
Sample Point I.D.'s	A1

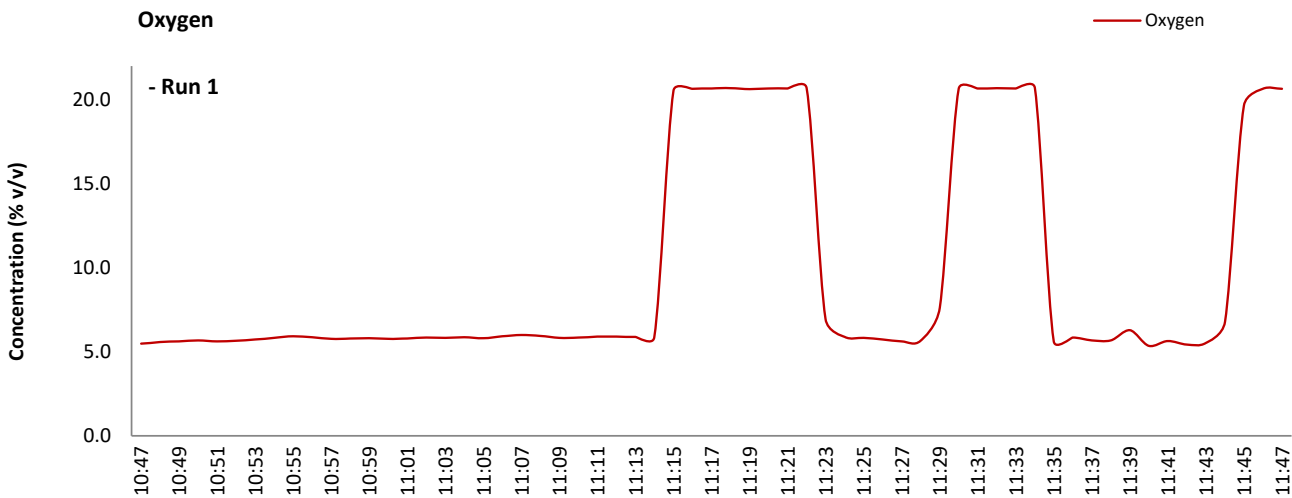
NOTE: Dilution performed to achieve correct span value

FORMAT: Number Used / Number Required

FORMAT: Number Used / Number Required

OXYGEN: DATA TREND

Graphical Trend of Data



APPENDIX 2

OXYGEN: SAMPLING DETAILS & QUALITY ASSURANCE

Sampling Details

Parameter	Units	Run 1
Sampling Times	-	10:47 - 11:47
Sampling Dates	-	20/11/2025
Instrument Range	% v/v	25.0
Span Gas Value	% v/v	8.0

Quality Assurance

Conditioning Unit Temperature	Units	Run 1
Average Temperature	°C	2.1
Allowable Temperature	< °C	4.0
Temperature Acceptable	-	Yes

Zero Drift	Units	Run 1
Zero at Analyser (Pre)	% v/v	0.00
Zero at Analyser (Post)	% v/v	0.06
Zero Drift	% v/v	0.06
Zero Drift	%	0.74
Drift Correction Applied	2-5%	No
Allowable Zero Drift	± %	5.00
Zero Drift Acceptable	-	Yes

Span Drift	Units	Run 1
Span at Analyser (Pre)	% v/v	8.10
Span at Analyser (Post)	% v/v	8.13
Span Drift	% v/v	0.03
Zero Adj. Span Drift	%	0.37
Drift Correction Applied	2-5%	No
Allowable Span Drift	± %	5.00
Span Drift Acceptable	-	Yes

Test Conditions	Units	Run 1
Run Ambient Temperature Range	°C	8 - 5

Method Deviations

Nature of Deviation	Run Number
(x = deviation applies to the associated run)	1
Lowest differential pressure < 5 Pa.	x

OXYGEN: MEASUREMENT UNCERTAINTY CALCULATIONS

Performance characteristics	RUN 1		Units
Limit value	N/A		%vol
Allowable MU	6.0		%
Measured concentration	9.72		%vol
Range Used	25.0		%vol
Cal gas conc.	21.1		%vol

Performance characteristics	RUN 1		Units
Response time	41		seconds
Number of readings in measurement	60		-
Repeatability at zero	0.02		% full scale
Repeatability at span level	0.02		% full scale
Deviation from linearity	0.08		% of value
Zero drift	0.74		% full scale
Span drift	-0.37		% full scale
Volume or pressure flow dependence	0.10		% of full scale
Atmospheric pressure dependence	0.19		% of value/kPa
Ambient temperature dependence	-0.21		% full scale/10K
Combined interference	0.00		% range
Dependence on voltage	0.02		% full scale/10V
Losses in the line (leak)	0.00		% of value
Uncertainty of calibration gas	2.00		% of value

Performance characteristic	RUN 1		Units
Standard deviation of repeatability at zero	use rep at span		%vol
Standard deviation of repeatability at span level	0.00		%vol
Lack of fit	0.01		%vol
Drift	0.07		%vol
Volume or pressure flow dependence	0.00		%vol
Atmospheric pressure dependence	0.01		%vol
Ambient temperature dependence	-0.03		%vol
Combined interference (from MCERTS Certificate)	0.00		%vol
Dependence on voltage	0.00		%vol
Losses in the line (leak)	0.00		%vol
Uncertainty of calibration gas	0.11		%vol

		RUN 1	Units
Measurement uncertainty	Result	9.72	%vol
Combined uncertainty		0.14	%vol
Expanded uncertainty	k = 1.96	0.27	%vol

	RUN 1	Units
Expanded uncertainty (no O ₂) - at 95% Confidence	2.75	% of Value
Result of Compliance with Uncertainty Requirement	COMPLIANT	-

Requirement for SRM is that Uncertainty should be 0.3% vol absolute or 6% relative whichever is the lower, on a dry gas basis. Source, EN 14789.

VERSION HISTORY

Version Number	Record of changes made within this version of the document
V1	The original document issued to the client