



**Title: Monitoring of Hydrogen Chloride, Ammonia
And Nickel Emissions**

Permit Number: TBC
Operator: CBE Plus Limited
Installation: Plating Line 1
Monitoring Dates: 6 November 2025

Reference Number: EI/10720

Client Organisation: CBE Plus Limited
Address: Enterprise Drive
Holmewood
Chesterfield
S42 5UZ

Monitoring Organisation: CES Environmental Instruments Ltd
Address: Bretby Business Park
Ashby Road
Burton on Trent
Staffordshire
DE15 0YZ

Date of Report: 1 December 2025

Report Prepared By: Martin Rodgers
MCERTS Registration Number: MM 04 531 (Level 2, TE1, TE2, TE3, TE4)

Signed: 
.....

Report Approved By: Robert Allen
MCERTS Registration Number: MM 02 009 (Level 2, TE1, TE2, TE3, TE4)

Signed: 
.....

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Part 1: Executive Summary

1.1 Monitoring Objectives

CBE Plus Limited placed a contract with CES Environmental Instruments Ltd for the compliance check monitoring of emissions to air from the Plating Line 1.

Plating Line 1

Plating Process

CBE+ is a global leader in precision Electroless Nickel Plating (ENP), complemented by precision CNC machining and a range of specialist ancillary services.

The test work was undertaken on 6 November 2025 by CES Environmental Instruments Ltd Engineers and carried out as part of CES Environmental Instruments Ltd job reference EI/10720.

The substances monitored were: -

Hydrogen Chloride (HCl)

Ammonia (NH₃)

Nickel (Ni)

On the day of testing there were no special requirements for the monitoring.

1.2 Monitoring Results

Emission Point Reference: Plating Line 1

Substance to be Monitored	Emission Limit Value	Periodic Monitoring Result	Uncertainty of Measurement (95% CI)	Blank Result	Units	Reference Conditions	Emission Rate	Date of Sampling	Start and End Times	Monitoring Method Reference	Accreditation for use of Method	Operating Status
Hydrogen Chloride	To Be Confirmed	0.0*	0.01	0.0*	mg/m ³	273K, 101.3kPa	-	6 November 2025	11:40-12:40	BS EN 1911	UKAS & MCERTS	Normal Operation
Ammonia	To Be Confirmed	0.5	0.07	0.0*	mg/m ³	273K, 101.3kPa	-	6 November 2025	10:35-11:35	EN ISO 21877	UKAS & MCERTS	Normal Operation
Nickel	To Be Confirmed	0.0022	0.0004	0.0*	mg/m ³	273K, 101.3kPa	0.0475g/hr	6 November 2025	09:30-10:30	BS EN 14385	UKAS & MCERTS	Normal Operation

*Indicates where the calculated concentration is below the detection limit of the monitoring standard. Where an analytical result is reported to be below the limit of detection, the limit of detection has been used.

1.3 Operating Information

Emission Point Reference: Plating Line 1

Process Type	Batch Sample Details	Fuel	Product	Load	Abatement
Continuous	-	Metal Components / HCl Rinse	Medium Phos Solution plating. De Lote Striper.	Plating Average = 20 Microns/hr	None

Comparison of Operator Continuous Emissions Monitoring Systems (CEMS) and Periodic Monitoring Results								
Substance to be Monitored	Emission Limit Value	Periodic Monitoring Result	Uncertainty of Measurement (95% CI)	Units	Reference Conditions	Date of Sampling	Start and End Times	CEMS Results
No CEMS Installed								

1.4 Monitoring Deviations

The sample plane does not comply upstream and downstream as per the requirements of BS EN 15259.

Part 2: Supporting Information

Appendix 1 General Information

CES Environmental Instruments Ltd staff details

Name	Role	MCERT Registration Number	Level 1	Level 2	TE1	TE2	TE3	TE4	At site
Paul Broxham	Team Leader	MM 13 1254		✓	✓	✓	✓	✓	T
				Feb 2030	Feb 2030	Feb 2030	Nov 2029	Nov 2029	
Derek Harvey	Team Leader	MM 06 686		✓	✓				✓
				June 2027	June 2027				

T = Nominated Team Leader on Site

CES Environmental Instruments Ltd method details

Pollutant	Method	CES Procedure
Hydrogen Chloride	BS EN 1911	WI 4/39
Ammonia	EN ISO 21877	WI 4/46
Nickel	BS EN 14385	WI4/30

Monitoring Equipment Used

Pump Box
Pitot 'S' Type

CES Environmental Instruments Ltd Reference: C286

CES Environmental Instruments Ltd Reference: C148

Appendix 2

Diagrams of Emission Point

Sampling Location

Dimensions	Cross Sectional Area	Orientation	Sample Ports Available/Used	Sampling Positions Per Plane	Standard
Dia = 700mm	0.385m ²	Vertical	Nickle (Ni) -2/2 HCL&NH3 – 2/1	4 1	BS EN 15259
Comments: Sample ports: 2 off 4" BSP sockets Single Point Sampling					
				Yes	No
Has homogeneity test been carried out?					✓
If Yes - Is stack gas homogenous?					
Any physical or regulatory restrictions regarding usage of equipment? N/A					

Compliance with BS EN 15259 / EA TGN M1	Yes	No
Does the sample plane comply upstream?		✓*
Does the sample plane comply downstream?		✓*
Are the appropriate sample ports fitted?	✓	
Do the stack gas velocity / temperature profiles comply?	✓	
Minimum platform area >5m²	✓	

*BS 15259 has a general requirement that the sampling plane shall be in a straight section of duct at least 5 hydraulic diameters downstream and 2 hydraulic diameters upstream of any bend or obstruction which could produce turbulent flow.



Appendix 3
Gas (Non-Instrumental Measurement & Results)

CES Environmental Instruments

Determination of Pollutants by Absorption RESULT SHEET	Site Name	CBE Plus Ltd	Date	06-Nov-25
	Job Reference	10720	Test No.	1
	Sample Location	Line 1	Time	11:40-12:40

Pollutant	Hydrogen Chloride (HCl)			
Analyte	De Chlorinated Water (H2O)			

Inputs				
Reference Temp T_{ref}	0 °C	273 K	Metered Gas Reading (Start)	1418.3034 m ³
Reference Pressure P_{ref}	101.3 kPa		Metered Gas Reading (End)	1419.4922 m ³
Reference Oxygen O_{2ref}	% v/v dry		Metered Correction	0.9667
Reference Moisture H_2O_{ref}	0.0 %		Metered Gas Volume VM_{meas}	1149.2 litres
Duct Temperature T_{meas}	25.0 °C		Meter Temperature TM_{meas}	25.0 °C
Duct Oxygen O_{2meas}	% v/v dry		Meter Pressure PM_{meas}	99100.0 Pa
Duct Shape (Round/Rect)	Round		Differential Meter Press (P_{me})	0.0 Pa
Duct Diameter	0.700 m		Barometric Pressure (P_b)	99100.0 Pa
Duct Area	0.385 m ²		Duct Pressure, Abs (P_{da})	99100.0 Pa
			Differential Duct Press (P_d)	0.0 Pa

Moisture Collection				Analysis Results			
Vessel	Wt on (g)	Wt off (g)	Δ W (g)	Metered Sample Vol @stp = $V \times 273 \times \frac{PM_{meas}}{(TM_{meas} + 273)}$	Trap 1	Vol	106.0 ml
Trap 1	585.1	587.4	2.3	Sample Vol @stp = 1029.9 litres	Trap 1	Conc **	0.050 µg/ml
Trap 2	586.9	589.5	2.6		Trap 2	Vol	110.0 ml
Trap 3	590.1	590.1	0.0		Trap 2	Conc	0.320 µg/ml
Trap 4	798.5	805.5	7.0		Trap 3	Vol	106.0 ml
Trap 5			0.0		Trap 3	Conc **	0.050 µg/ml
Total Weight Gain (g) = 11.9					Moisture = $\frac{H_2O \text{ Gas Vol stp} \times 100}{\text{Vol stp} + H_2O \text{ (vol gas stp)}}$ = 1.42 %	Trap 4	Vol
H ₂ O Gas Vol @stp = $\frac{\Delta W}{18} \times 22.412$ H ₂ O Vol = 14.82 litres (stp = 101.3kPa and 0°C)				Trap 4		Conc	µg/ml
				Washing		Vol	ml
				Washing		Conc	µg/ml
				Reagent Blank	Vol	106.0 ml	
				Reagent Blank	Conc **	0.050 µg/ml	
				Mass on Filter		µg	

Calculations	Sample Analysis																				
$\text{Meter Gas Vol Vref} = V_m \times (T_{ref} / TM_{meas}) \times (PM_{meas} / P_{ref})$ $= 1029.938 \text{ dm}^3$ $\text{Vref} = 1.029938 \text{ m}^3 \quad (101.3\text{kPa, } 0^\circ\text{C and dry})$ $\text{Total Net Mass Sampled} = \sum \text{Mass in Sample} - \sum \text{Mass in Reagent}$ $= 29.700 \text{ } \mu\text{g}$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Mass in Sample =</td> <td>Concentration x Volume</td> </tr> <tr> <td>Mass in Trap 1 =</td> <td>0.000 µg</td> </tr> <tr> <td>Mass in Trap 2 =</td> <td>29.700 µg</td> </tr> <tr> <td>Mass in Trap 3 =</td> <td>0.000 µg</td> </tr> <tr> <td>Mass in Trap 4 =</td> <td>0.000 µg</td> </tr> <tr> <td>Mass in Washing =</td> <td>0.000 µg</td> </tr> <tr> <td>Mass in Reagent =</td> <td>5.300 µg</td> </tr> <tr> <td>Mass in Filter =</td> <td>0.000 µg</td> </tr> <tr> <td>Abs Eff = $T1+T2/(T1+T2+T3)$</td> <td>88.4279476 %</td> </tr> <tr> <td colspan="2">Concentration = $\frac{\text{Trap } \mu\text{g/ml} - \text{Reagent } \mu\text{g/ml}}{\text{Volume}}$</td> </tr> </table> <p><small>** indicates where a value less than the limit of detection has been reported, the value lies somewhere between the detection limit and zero. The limit of detection is used to determine the concentration. If analytical concentration is at the limit of detection the absorber efficiency cannot be reliably calculated</small></p>	Mass in Sample =	Concentration x Volume	Mass in Trap 1 =	0.000 µg	Mass in Trap 2 =	29.700 µg	Mass in Trap 3 =	0.000 µg	Mass in Trap 4 =	0.000 µg	Mass in Washing =	0.000 µg	Mass in Reagent =	5.300 µg	Mass in Filter =	0.000 µg	Abs Eff = $T1+T2/(T1+T2+T3)$	88.4279476 %	Concentration = $\frac{\text{Trap } \mu\text{g/ml} - \text{Reagent } \mu\text{g/ml}}{\text{Volume}}$	
Mass in Sample =	Concentration x Volume																				
Mass in Trap 1 =	0.000 µg																				
Mass in Trap 2 =	29.700 µg																				
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Mass in Reagent =	5.300 µg																				
Mass in Filter =	0.000 µg																				
Abs Eff = $T1+T2/(T1+T2+T3)$	88.4279476 %																				
Concentration = $\frac{\text{Trap } \mu\text{g/ml} - \text{Reagent } \mu\text{g/ml}}{\text{Volume}}$																					

Concentration	
<p>C1 @ Concentration Actual = 0.0 mg/m³</p> <p>C2 @ 101.3kPa, 0°C and wet = $C_3 \times (100 - H_2O_{meas}) / (100 - H_2O_{ref})$ = 0.0 mg/m³</p> <p>C3 @ 101.3kPa, 0°C and dry = Total Net Mass Sampled x 0.001 / Meter Gas Vol Vref 0.0 mg/m³</p> <p>C4 @ 101.3kPa, 0°C, O_{2ref} and dry = $C_3 \times (20.9 - O_{2ref}) / (20.9 - O_{2meas})$ = 0.0 mg/m³</p>	Verified

Weighing Machine ID = 264	Gas Meter ID = 286	
Verified by = PB		
Weight	Pre-test	Post-test
200g (± 1g)	199.6	199.6
400g (± 1g)	399.7	399.7
600g (± 1g)	599.3	599.3
Off CTR Test (±1g)	199.6	199.6
Leak Check (l/min)	0.0	0.0
Flow Rate (l/min)	1.5	1.5

CES Environmental Instruments

Determination of Pollutants by Absorption RESULT SHEET	Site Name	CBE Plus Ltd	Date	06-Nov-25
	Job Reference	10720	Test No.	Blank
	Sample Location	Line 1	Time	11:40-12:40

Pollutant	Hydrogen Chloride (HCl)			
Analyte	De Chlorinated Water (H2O)			

Inputs				
Reference Temp T _{ref}	0 °C	273 K	Metered Gas Reading (Start)	1418.3034 m ³
Reference Pressure P _{ref}	101.3 kPa		Metered Gas Reading (End)	1419.4922 m ³
Reference Oxygen O _{2ref}	0.0 % v/v dry		Metered Correction	0.9667
Reference Moisture H ₂ O _{ref}	0.0 %		Metered Gas Volume VM _{meas}	1149.2 litres
Duct Temperature T _{meas}	25.0 °C		Meter Temperature TM _{meas}	25.0 °C
Duct Oxygen O _{2meas}	0.0 % v/v dry		Meter Pressure PM _{meas}	99100.0 Pa
Duct Shape (Round/Rect)	Round		Differential Meter Press (Pme)	0.0 Pa
Duct Diameter	0.700 m		Barometric Pressure (Pb)	99100.0 Pa
Duct Area	0.385 m ²		Duct Pressure, Abs (Pda)	99100.0 Pa
			Differential Duct Press(Pd)	0.0 Pa

Moisture Collection				Analysis Results				
Vessel	Wt on (g)	Wt off (g)	Δ W (g)	Metered Sample Vol @stp = V x (273 x PM _{meas} / (TM _{meas} + 273)) 101300	Trap 1	Vol	106.0 ml	
Trap 1	585.1	587.4	2.3		Trap 1	Conc **	0.050 µg/ml	
Trap 2	586.9	589.5	2.6		Trap 2	Vol	106.0 ml	
Trap 3	590.1	590.1	0.0		Trap 2	Conc **	0.050 µg/ml	
Trap 4	798.5	805.5	7.0		Trap 3	Vol	111.0 ml	
Trap 5	0.0	0.0	0.0		Trap 3	Conc **	0.050 µg/ml	
Total Weight Gain (g) = 11.9				Sample Vol @stp = 1029.9 litres	Trap 4	Vol	ml	
H ₂ O Gas Vol @stp = ΔW/18 x 22.412 H ₂ O Vol = 14.82 litres (stp = 101.3kPa and 0°C)					Moisture = $\frac{H_2O \text{ Gas Vol stp} \times 100}{\text{Vol stp} + H_2O \text{ (vol gas stp)}}$			
					= 1.42 %			
					Trap 4	Conc	µg/ml	
				Washing	Vol	ml		
				Washing	Conc	µg/ml		
				Reagent Blank	Vol	106.0 ml		
				Reagent Blank	Conc **	0.050 µg/ml		
				Mass on Filter		µg		

Calculations	Sample Analysis
Meter Gas Vol Vref = Vm x (T _{ref} / TM _{meas}) x (PM _{meas} / P _{ref})	Mass in Sample = Concentration x Volume
= 1029.938 dm ³	Mass in Trap 1 = 0.000 µg
Vref = 1.029938 m ³ (101.3kPa, 0°C and dry)	Mass in Trap 2 = 0.000 µg
	Mass in Trap 3 = 0.000 µg
	Mass in Trap 4 = 0.000 µg
	Mass in Washing = 0.000 µg
	Mass in Reagent = 5.300 µg
Total Net Mass Sampled = ΣMass in Sample - ΣMass in Reagent	Mass in Filter = 0.000 µg
= 0.000 µg	Abs Eff = T1+T2/(T1+T2+T3) = 65.63 %
	Concentration = Trap µg/ml - Reagent µg/ml
	<small>** indicates where a value less than the limit of detection has been reported, the value lies somewhere between the detection limit and zero. The limit of detection is used to determine the concentration. If analytical concentration is at the limit of detection the absorber efficiency cannot be reliably calculated</small>

Concentration
C1 @ Concentration Actual = 0.0 mg/m³
C2 @ 101.3kPa, 0°C and wet = C3 x (100-H₂O_{meas})/(100-H₂O_{ref}) = 0.0 mg/m³
C3 @ 101.3kPa, 0°C and dry = Total Net Mass Sampled x 0.001/Meter Gas Vol Vref = 0.0 mg/m³
C4 @ 101.3kPa, 0°C, O_{2ref} and dry = C3 x (20.9-O_{2ref})/(20.9-O_{2meas}) = 0.0 mg/m³
Verified

Weighing Machine ID = 264	Gas Meter ID = 286	
Verified by = PB		
Weight	Pre-test	Post-test
200g (± 1g)	199.6	199.6
400g (± 1g)	399.7	399.7
600g (± 1g)	599.3	599.3
Off CTR Test (±1g)	199.6	199.6
Leak Check (l/min)	0.0	0.0
Flow Rate (l/min)	1.5	1.5

CES Environmental Instruments

Determination of Pollutants by Absorption RESULT SHEET	Site Name	CBE Plus Ltd	Date	06-Nov-25
	Job Reference	10720	Test No.	1
	Sample Location	Line 1	Time	10:35-11:35

Pollutant	Ammonia (NH3)			
Analyte	H2SO4			

Inputs				
Reference Temp T_{ref}	0 °C	273 K	Metered Gas Reading (Start)	1417.1064 m ³
Reference Pressure P_{ref}	101.3 kPa		Metered Gas Reading (End)	1418.2952 m ³
Reference Oxygen O_{2ref}	% v/v dry		Metered Correction	0.9667
Reference Moisture H_2O_{ref}	0.0 %		Metered Gas Volume VM_{meas}	1149.2 litres
Duct Temperature T_{meas}	26.0 °C		Meter Temperature TM_{meas}	21.8 °C
Duct Oxygen O_{2meas}	% v/v dry		Meter Pressure PM_{meas}	99100.0 Pa
Duct Shape (Round/Rect)	Round		Differential Meter Press (P_{me})	0.0 Pa
Duct Diameter	0.700 m		Barometric Pressure (P_b)	99100.0 Pa
Duct Area	0.385 m ²		Duct Pressure, Abs (P_{da})	99100.0 Pa
			Differential Duct Press (P_d)	0.0 Pa

Moisture Collection				Analysis Results			
Vessel	Wt on (g)	Wt off (g)	ΔW (g)	Metered Sample Vol @stp = $V \times \frac{273 \times PM_{meas}}{(TM_{meas} + 273)}$ 101300	Trap 1	Vol	121.0 ml
Trap 1	618.8	620.7	1.9		Trap 1	Conc	4.400 µg/ml
Trap 2	603.2	607.3	4.1		Trap 2	Vol	111.0 ml
Trap 3	624.7	624.7	0.0		Trap 2	Conc **	0.100 µg/ml
Trap 4	711.7	718.5	6.8		Trap 3	Vol	110.0 ml
Trap 5			0.0		Trap 3	Conc **	0.100 µg/ml
Total Weight Gain (g) = 12.8				Sample Vol @stp = 1041.3 litres	Trap 4	Vol	ml
H_2O Gas Vol @stp = $\Delta W / 18 \times 22.412$ H_2O Vol = 15.94 litres (stp = 101.3kPa and 0°C)					Trap 4	Conc	µg/ml
					Washing	Vol	ml
Moisture = $\frac{H_2O \text{ Gas Vol stp} \times 100}{\text{Vol stp} + H_2O \text{ (vol gas stp)}}$ = 1.51 %					Washing	Conc	µg/ml
				Reagent Blank	Vol	112.0 ml	
				Reagent Blank	Conc **	0.100 µg/ml	
				Mass on Filter		µg	

Calculations	Sample Analysis														
$\text{Meter Gas Vol Vref} = V_m \times (T_{ref} / TM_{meas}) \times (PM_{meas} / P_{ref})$ $= 1041.294 \text{ dm}^3$ $\text{Vref} = 1.041294 \text{ m}^3 \quad (101.3\text{kPa, } 0^\circ\text{C and dry})$ $\text{Total Net Mass Sampled} = \sum \text{Mass in Sample} - \sum \text{Mass in Reagent}$ $= 520.300 \text{ } \mu\text{g}$	$\text{Mass in Sample} = \text{Concentration} \times \text{Volume}$ <table style="width: 100%;"> <tr><td>Mass in Trap 1 =</td><td>520.300 µg</td></tr> <tr><td>Mass in Trap 2 =</td><td>0.000 µg</td></tr> <tr><td>Mass in Trap 3 =</td><td>0.000 µg</td></tr> <tr><td>Mass in Trap 4 =</td><td>0.000 µg</td></tr> <tr><td>Mass in Washing =</td><td>0.000 µg</td></tr> <tr><td>Mass in Reagent =</td><td>11.200 µg</td></tr> <tr><td>Mass in Filter =</td><td>0.000 µg</td></tr> </table> $\text{Abs Eff} = \frac{T1+T2}{(T1+T2+T3)} = 98.01623084 \%$ $\text{Concentration} = \frac{\text{Trap } \mu\text{g/ml} - \text{Reagent } \mu\text{g/ml}}{\text{Volume}}$ <p><small>** indicates where a value less than the limit of detection has been reported, the value lies somewhere between the detection limit and zero. The limit of detection is used to determine the concentration. If analytical concentration is at the limit of detection the absorber efficiency cannot be reliably calculated</small></p>	Mass in Trap 1 =	520.300 µg	Mass in Trap 2 =	0.000 µg	Mass in Trap 3 =	0.000 µg	Mass in Trap 4 =	0.000 µg	Mass in Washing =	0.000 µg	Mass in Reagent =	11.200 µg	Mass in Filter =	0.000 µg
Mass in Trap 1 =	520.300 µg														
Mass in Trap 2 =	0.000 µg														
Mass in Trap 3 =	0.000 µg														
Mass in Trap 4 =	0.000 µg														
Mass in Washing =	0.000 µg														
Mass in Reagent =	11.200 µg														
Mass in Filter =	0.000 µg														

Concentration	
C1 @ Concentration Actual =	0.5 mg/m³
C2 @ 101.3kPa, 0°C and wet = $C_3 \times (100 - H_2O_{meas}) / (100 - H_2O_{ref})$	0.5 mg/m³
C3 @ 101.3kPa, 0°C and dry = Total Net Mass Sampled x 0.001 / Meter Gas Vol Vref	0.5 mg/m³
C4 @ 101.3kPa, 0°C, O_{2ref} and dry = $C_3 \times (20.9 - O_{2ref}) / (20.9 - O_{2meas})$	0.5 mg/m³
Verified	

Weighing Machine ID = 264	Gas Meter ID = 286	
Verified by = PB		
Weight	Pre-test	Post-test
200g (± 1g)	199.6	199.6
400g (± 1g)	399.7	399.7
600g (± 1g)	599.3	599.3
Off CTR Test (±1g)	199.6	199.6
Leak Check (l/min)	0.0	0.0
Flow Rate (l/min)	1.5	1.5

CES Environmental Instruments

Determination of Pollutants by Absorption RESULT SHEET	Site Name	CBE Plus Ltd	Date	06-Nov-25
	Job Reference	10720	Test No.	Blank
	Sample Location	Line 1	Time	10:35-11:35

Pollutant	Ammonia (NH3)			
Analyte	H2SO4			

Inputs				
Reference Temp T_{ref}	0 °C	273 K	Metered Gas Reading (Start)	1417.1064 m ³
Reference Pressure P_{ref}	101.3 kPa		Metered Gas Reading (End)	1418.2952 m ³
Reference Oxygen O_{2ref}	0.0 % v/v dry		Metered Correction	0.9667
Reference Moisture H_2O_{ref}	0.0 %		Metered Gas Volume VM_{meas}	1149.2 litres
Duct Temperature T_{meas}	26.0 °C		Meter Temperature TM_{meas}	21.8 °C
Duct Oxygen O_{2meas}	0.0 % v/v dry		Meter Pressure PM_{meas}	99100.0 Pa
Duct Shape (Round/Rect)	Round		Differential Meter Press (P_{me})	0.0 Pa
Duct Diameter	0.700 m		Barometric Pressure (P_b)	99100.0 Pa
Duct Area	0.385 m ²		Duct Pressure, Abs (P_{da})	99100.0 Pa
			Differential Duct Press (P_d)	0.0 Pa

Moisture Collection				Analysis Results			
Vessel	Wt on (g)	Wt off (g)	ΔW (g)	Metered Sample Vol @stp = $V \times \frac{273 \times PM_{meas}}{(TM_{meas} + 273)}$ 101300	Trap 1	Vol	110.0 ml
Trap 1	618.8	620.7	1.9		Trap 1	Conc **	0.100 µg/ml
Trap 2	603.2	607.3	4.1		Trap 2	Vol	109.0 ml
Trap 3	624.7	624.7	0.0		Trap 2	Conc **	0.100 µg/ml
Trap 4	711.7	718.5	6.8		Trap 3	Vol	107.0 ml
Trap 5	0.0	0.0	0.0		Trap 3	Conc **	0.100 µg/ml
Total Weight Gain (g) = 12.8				Sample Vol @stp = 1041.3 litres	Trap 4	Vol	ml
H_2O Gas Vol @stp = $\Delta W / 18 \times 22.412$ H_2O Vol = 15.94 litres (stp = 101.3kPa and 0°C)					Trap 4	Conc	µg/ml
					Washing	Vol	ml
					Washing	Conc	µg/ml
				Reagent Blank	Vol	112.0 ml	
$Moisture = \frac{H_2O \text{ Gas Vol stp} \times 100}{\text{Vol stp} + H_2O \text{ (vol gas stp)}}$ = 1.51 %				Reagent Blank	Conc **	0.100 µg/ml	
				Mass on Filter		µg	

Calculations	Sample Analysis
$Meter \text{ Gas Vol } V_{ref} = V_m \times (T_{ref} / TM_{meas}) \times (PM_{meas} / P_{ref})$ $= 1041.294 \text{ dm}^3$ $V_{ref} = 1.041294 \text{ m}^3 \quad (101.3kPa, 0^\circ C \text{ and dry})$	$Mass \text{ in Sample} = Concentration \times Volume$ Mass in Trap 1 = 0.000 µg Mass in Trap 2 = 0.000 µg Mass in Trap 3 = 0.000 µg Mass in Trap 4 = 0.000 µg Mass in Washing = 0.000 µg Mass in Reagent = 11.200 µg Mass in Filter = 0.000 µg $Abs \text{ Eff} = T1+T2/(T1+T2+T3) = 67.18 \%$
$Total \text{ Net Mass Sampled} = \Sigma Mass \text{ in Sample} - \Sigma Mass \text{ in Reagent}$ $= 0.000 \quad \mu g$	$Concentration = \frac{Trap \mu g/ml - Reagent \mu g/ml}{Volume}$ ** indicates where a value less than the limit of detection has been reported, the value lies somewhere between the detection limit and zero. The limit of detection is used to determine the concentration. If analytical concentration is at the limit of detection the absorber efficiency cannot be reliably calculated

Concentration
$C1 @ \text{Concentration Actual} = 0.0 \text{ mg/m}^3$ $C2 @ 101.3kPa, 0^\circ C \text{ and wet} = C3 \times (100 - H_2O_{meas}) / (100 - H_2O_{ref})$ $= 0.0 \text{ mg/m}^3$ $C3 @ 101.3kPa, 0^\circ C \text{ and dry} = Total \text{ Net Mass Sampled} \times 0.001 / Meter \text{ Gas Vol } V_{ref}$ $= 0.0 \text{ mg/m}^3$ $C4 @ 101.3kPa, 0^\circ C, O_{2ref} \text{ and dry} = C3 \times (20.9 - O_{2ref}) / (20.9 - O_{2meas})$ $= 0.0 \text{ mg/m}^3$
Verified

Weighing Machine ID = 264	Gas Meter ID = 286	
Verified by = PB		
Weight	Pre-test	Post-test
200g (± 1g)	199.6	199.6
400g (± 1g)	399.7	399.7
600g (± 1g)	599.3	599.3
Off CTR Test (±1g)	199.6	199.6
Leak Check (l/min)	0.0	0.0
Flow Rate (l/min)	1.5	1.5

Appendix 4
Trace Species (Sampling Measurement & Results)

CES Environmental Instruments Ltd

Determination of Heavy Metal Concentration BS EN 14385: 2004	Client CBE Plus Ltd Job Number 10720 Site Line 1	Date 06/11/2025 Test Blank Test Period 09:30-10:30
---	---	---

Inputs	Volumes
Reference Temp T_{ref} 0.0 °C	273 K
Reference Pressure P_{ref} 101.3 kPa	
Reference Oxygen O_{2ref} 21.0 %	
Reference Moisture H_2O_{ref} 0.0 %	
Metered Gas Volume VM_{meas} 1162.9 litres	Meter Gas Vol $V_{ref} = VM_{meas} \times (T_{ref}/TM_{meas}) \times (PM_{meas}/P_{ref})$
Meter Temperature TM_{meas} 12.4 °C	
Meter Pressure PM_{meas} 99.1 kPa	= 1088.3 litres
Duct Oxygen O_{2meas} 21.0 % v/v dry	Meter Gas Vol $V_{ref} = 1.0883 \text{ m}^3$ (101.3kPa, 0°C and dry)
Duct Moisture H_2O_{meas} 1.4 % v/v	
Duct Temperature T_{meas} 19.6 °C	
Duct Pressure, Abs (Pda) 99.1 kPa	
Calculated Actual Gas Flow 6.616 m ³ /s	
Calculated Reference Gas Flow Q_{ref} 6.037 m ³ /s (101.3kPa, 0°C and wet)	
	21731.6 m ³ /hr (101.3kPa, 0°C and wet)

Metal	Blank Filter	Batch Filter	HNO ₃ /H ₂ O ₂ 1 + 2	HNO ₃ /H ₂ O ₂ 1 + 2	HNO ₃ /H ₂ O ₂ 1 + 2	HNO ₃ /H ₂ O ₂ 3	HNO ₃ /H ₂ O ₂ 3	HNO ₃ /H ₂ O ₂ 3	10% of Total Metal	HNO ₃ /H ₂ O ₂ Reagent	Total	
	µg S3	µg S8	µg/l S1	µg/l S1	µg S1	µg/l S2	µg/l S2	µg S2	µg	µg	µg/l S7	
Arsenic	0.50	0.50	0.30	0.214	0.00	0.30	0.109	0.00	0.00	0.00	0.30	0.00
Cadmium*	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Cobalt	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Nickel	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Lead	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Antimony	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Thallium*	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Vanadium	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00
Selenium	0.00	0.00	0.00	0.000	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00

Where a value less than the limit of detection has been reported, the value lies somewhere between the detection limit and zero. The limit of detection is used to determine the concentration. The method is applicable to each specific Metal element is in the concentration range 0.005mg/m³ to 0.5mg/m³

Metal Concentration and Mass Emission Rate

Metal	Concentration mg/m ³ @Actual	Concentration mg/m ³ @101.3kPa, 0°C and wet	Concentration mg/m ³ @101.3kPa, 0°C and dry	Concentration mg/m ³ @101.3kPa, 0°C, O_{2ref} and dry	Emission Rate g/hr
Arsenic	0.0000	0.0000	0.0000	0.0000	0.0000
Cadmium*	0.0000	0.0000	0.0000	0.0000	0.0000
Cobalt	0.0000	0.0000	0.0000	0.0000	0.0000
Chromium	0.0000	0.0000	0.0000	0.0000	0.0000
Copper	0.0000	0.0000	0.0000	0.0000	0.0000
Manganese	0.0000	0.0000	0.0000	0.0000	0.0000
Nickel	0.0000	0.0000	0.0000	0.0000	0.0000
Lead	0.0000	0.0000	0.0000	0.0000	0.0000
Antimony	0.0000	0.0000	0.0000	0.0000	0.0000
Thallium*	0.0000	0.0000	0.0000	0.0000	0.0000
Vanadium	0.0000	0.0000	0.0000	0.0000	0.0000
Selenium	0.0000	0.0000	0.0000	0.0000	0.0000
*Total	0.0000	0.0000	0.0000	0.0000	0.0000
Rest of Metals	0.0000	0.0000	0.0000	0.0000	0.0000

Verified

Appendix 5
Analysis (Laboratory Results)

Certificate of Analysis

Report No.: 25-09812-1

Issue No.: 1

Date of Issue 20/11/2025

Customer Details: CES Environmental Instruments Ltd, Bretby Business Park, Ashby Road, Burton on Trent, Staffordshire, DE15 0YZ

Customer Contact: Jane Fowkes

Customer Order No.: 12614

Customer Reference: Not Supplied

Quotation Reference: Q25-07745

Description: 6 liquid samples

Date Received: 10/11/2025

Date Started: 11/11/2025

Date Completed: 19/11/2025

Test Methods: Details available on request (refer to SOP code against relevant result/s)

Notes: None



Approved By: Joanne Dewhurst, Operational Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

This certificate shall not be reproduced except in full without the prior written approval of the laboratory.

Observations and interpretations are outside of the scope of UKAS accreditation.

Results reported herein relate only to the items supplied to the laboratory for testing.

Results on an Interim Report are not dry-weight corrected.

Where the laboratory is not responsible for the sampling, results apply to the sample(s) as they were received.

The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.



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Unit 12, Waters Edge Business Park, Modwen Road, Salford, M5 3EZ. T +44 161 872 2443

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Results Summary

Report No.: 25-09812-1

Customer Reference: Not Supplied

Customer Order No: 12614

Customer Sample No	10720/S9	10720/S10	10720/S11	10720/S12	10720/S13	10720/S14
RPS Sample No	333259	333260	333261	333262	333263	333264
Sample Matrix	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION
Sampling Date	06/11/2025	06/11/2025	06/11/2025	06/11/2025	06/11/2025	06/11/2025

Determinand	CAS No	Codes	SOP	RL	Units	10720/S9	10720/S10	10720/S11	10720/S12	10720/S13	10720/S14
volume of sample supplied		U	N/A	n/a	ml	106	106	111	106	110	106
hydrogen chloride	7647-01-0	UM	C27	0.05	ug/mL	< 0.05	< 0.05	< 0.05	< 0.05	0.32	< 0.05

Deviating Samples

Report No.: 25-09812-1

Customer Reference: Not Supplied

Customer Order No: 12614

Our policy on Deviating Samples has been implemented in accordance with UKAS Policy on Deviating Samples (TPS63). RPS is not responsible for the integrity of samples as received, unless RPS personnel performed the sampling. Samples submitted may be declared to be deviating. Where applicable the analysis method remains UKAS accredited, however results reported for a deviating sample may be compromised. Where no sampling date was supplied, samples have been declared to be deviating. If the date can be supplied, results may be reissued if assessed not deviating. Where the sample container used was unsuitable or broken, the sample is flagged as deviating and re-sampling/re-submission may be required.

RPS No.	Customer No.	Customer ID	Date Sampled	Containers Received	Deviating	Reason for Deviation
333259	10720/S9		06/11/2025	Container	No	
333260	10720/S10		06/11/2025	Container	No	
333261	10720/S11		06/11/2025	Container	No	
333262	10720/S12		06/11/2025	Container	No	
333263	10720/S13		06/11/2025	Container	No	
333264	10720/S14		06/11/2025	Container	No	

Report No.: 25-09812-1

Key Code	Description
N	Not Accredited Test
U	UKAS Accredited Test - UKAS accreditation is only implied if the report carries the UKAS logo
UF	UKAS Flexible Scope Test
M	MCERTS Accredited Test - MCERTS accreditation is only implied if the report carries the MCERTS logo
O	Marine Management Organisation (MMO) Validated
SN	Subcontracted to approved laboratory not accredited for the test
SU	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
SIN	Subcontracted to internal RPS Group laboratory not accredited for the test
SIU	Subcontracted to internal RPS Group laboratory UKAS Accredited for the test
SIM	Subcontracted to internal RPS Group laboratory MCERTS/UKAS Accredited for the test
I/S (in results)	Insufficient Sample
U/S (in results)	Unsuitable Sample
S/C (in results)	See Comments
ND (in results)	Not Detected
L (in results)	Result is outside normal limits

Please note that all samples will be destroyed 4 WEEKS after the report has been issued.

Note: Sample retention may be subject to agreement with the customer for particular projects

Certificate Notes	Description
Note 1	This test report shall not be reproduced except in full, without written approval of the Laboratory.
Note 2	Unless otherwise stated, results are not corrected for analytical recoveries.
Note 3	Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied.
Note 4	Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
Note 5	Unless otherwise stated, method D9 conditioning temperatures are 180°C for pre-weigh and 160°C for re-weigh. The PDF version of the certificate is the definitive copy and the Excel version is uncontrolled and provided for information only.
Note 6	

Note: Where the following information is included in this certificate, it has usually been supplied by the customer: Customer Sample ID, Sample Location, Sampling Date and Sample Air Volumes. The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.

Report No.: 25-09812-1

Determinand	CAS No	Media	SOP	% Recovery	% Uncertainty
acetaldehyde	75-07-0	tube	A40	98	16.2
benzaldehyde	100-52-7	tube	A40	100	19.4
butyraldehyde	123-72-8	tube	A40	92	11.5
formaldehyde	50-00-0	tube	A40	97	12.8
hexanal	66-25-1	tube	A40	89	11
propionaldehyde	123-38-6	tube	A40	96	12.6
valeraldehyde	110-62-3	tube	A40	93	12.3
ammonia	7664-41-7	sulphuric acid solution	A6	n/a	8.9
chlorine	7782-50-5	sodium hydroxide solution	C27	n/a	15.2
hydrogen bromide	10035-10-6	sulphuric acid solution	C27	n/a	10.9
hydrogen chloride	7647-01-0	deionised water	C27	n/a	7.9
hydrogen chloride	7647-01-0	sulphuric acid solution	C27	n/a	13.3
hydrogen fluoride	7664-3-3	sodium hydroxide solution	C27	n/a	7.9
sulphur dioxide	7446-09-5	hydrogen peroxide solution	C27	n/a	7.7
nitrogen oxide	10102-43-9	potassium permanganate solution	C27	n/a	11.7
particulates	n/a	filter	D9	n/a	12.2
particulates	n/a	wash solution	D9	n/a	14.8
formaldehyde	50-00-0	deionised water	M103	n/a	23.7
2,4- & 2,6-toluene diisocyanate (TDI)	n/a	filter	M119	n/a	8.6
hexamethylene diisocyanate (HDI)	822-06-0	filter	M119	n/a	5.6
methylene diphenyl diisocyanate (MDI)	101-68-8	filter	M119	n/a	11.8
hydrogen sulphide	7783-06-4	zinc acetate solution	M120	n/a	4.2
antimony	7440-36-0	filter	M31	n/a	10.3
arsenic	7440-38-2	filter	M31	n/a	17.1
cadmium	7440-43-9	filter	M31	n/a	12.1
chromium	7440-47-3	filter	M31	n/a	17.1
cobalt	7440-48-4	filter	M31	n/a	13.1
copper	7440-50-8	filter	M31	n/a	14
lead	7439-92-1	filter	M31	n/a	9.8
manganese	7439-96-5	filter	M31	n/a	17.5
nickel	7440-02-0	filter	M31	n/a	14.4
thallium	7440-28-0	filter	M31	n/a	15.3
tin	7440-31-5	filter	M31	n/a	18.5
vanadium	7440-62-2	filter	M31	n/a	12.1
zinc	7440-66-6	filter	M31	n/a	15.2
antimony	7440-36-0	nitric acid wash	M31	n/a	10.3
arsenic	7440-38-2	nitric acid wash	M31	n/a	17.1
cadmium	7440-43-9	nitric acid wash	M31	n/a	12.1
chromium	7440-47-3	nitric acid wash	M31	n/a	17.1
cobalt	7440-48-4	nitric acid wash	M31	n/a	13.1
copper	7440-50-8	nitric acid wash	M31	n/a	14
lead	7439-92-1	nitric acid wash	M31	n/a	9.8
manganese	7439-96-5	nitric acid wash	M31	n/a	17.5
nickel	7440-02-0	nitric acid wash	M31	n/a	14.4
selenium	7782-49-2	nitric acid wash	M31	n/a	15.1
thallium	7440-28-0	nitric acid wash	M31	n/a	15.3
tin	7440-31-5	nitric acid wash	M31	n/a	18.5
vanadium	7440-62-2	nitric acid wash	M31	n/a	12.1
zinc	7440-66-6	nitric acid wash	M31	n/a	15.2
antimony	7440-36-0	nitric/peroxide solution	M31	n/a	5.9
arsenic	7440-38-2	nitric/peroxide solution	M31	n/a	6.8
cadmium	7440-43-9	nitric/peroxide solution	M31	n/a	6.3
chromium	7440-47-3	nitric/peroxide solution	M31	n/a	7.2
cobalt	7440-48-4	nitric/peroxide solution	M31	n/a	5.2
copper	7440-50-8	nitric/peroxide solution	M31	n/a	6.8
lead	7439-92-1	nitric/peroxide solution	M31	n/a	8.6
manganese	7439-96-5	nitric/peroxide solution	M31	n/a	9.6
nickel	7440-02-0	nitric/peroxide solution	M31	n/a	5.5
selenium	7782-49-2	nitric/peroxide solution	M31	n/a	8.7
thallium	7440-28-0	nitric/peroxide solution	M31	n/a	7.7
tin	7440-31-5	nitric/peroxide solution	M31	n/a	5.8
vanadium	7440-62-2	nitric/peroxide solution	M31	n/a	6.7
zinc	7440-66-6	nitric/peroxide solution	M31	n/a	11.9
1,2,4-trimethylbenzene	95-63-6	tube	O8	88	8.1
1,3,5-trimethylbenzene	108-67-8	tube	O8	92	7.7
2-ethyltoluene	611-14-3	tube	O8	91	8.4
3- & 4-ethyltoluene	n/a	tube	O8	91	8.4
benzene	71-43-2	tube	O8	90	13.9
butyl acetate	123-86-4	tube	O8	90	10.3
decane	124-18-5	tube	O8	97	6.7
dichloromethane	75-09-2	tube	O8	88	24
ethyl acetate	141-78-6	tube	O8	n/a	n/a
ethyl benzene	100-41-4	tube	O8	92	9.8
heptane	142-82-5	tube	O8	94	10.5
hexane	110-54-3	tube	O8	n/a	n/a
limonene	138-86-3	tube	O8	93	13
m- & p-xylene	n/a	tube	O8	90	9.3
methyl isobutyl ketone (MIBK)	108-10-1	tube	O8	86	10
methyl tert-butyl ether (MTBE)	1634-04-4	tube	O8	92	15
o-xylene	95-47-6	tube	O8	86	9.9
propylbenzene	103-65-1	tube	O8	92	7.5
tetrachloroethylene	127-18-4	tube	O8	91	9.3
tetrahydrofuran (THF)	109-99-9	tube	O8	87	14.7
toluene	108-88-3	tube	O8	89	10.7
trichloroethylene	79-01-6	tube	O8	91	10.6
m- & p-cresol	n/a	tube	P1	n/a	11
m- & p-xylenol	n/a	tube	P1	n/a	11.9
o-cresol	95-48-7	tube	P1	n/a	10.8
o-xylenol	526-75-0	tube	P1	n/a	12
phenol	108-95-2	tube	P1	n/a	10.4

Certificate of Analysis

Report No.: 25-09813-1

Issue No.: 1

Date of Issue: 20/11/2025

Customer Details: CES Environmental Instruments Ltd, Bretby Business Park, Ashby Road, Burton on Trent, Staffordshire, DE15 0YZ

Customer Contact: Jane Fowkes

Customer Order No.: 12615

Customer Reference: Not Supplied

Quotation Reference: Q25-07745

Description: 1 liquid sample

Date Received: 10/11/2025

Date Started: 11/11/2025

Date Completed: 19/11/2025

Test Methods: Details available on request (refer to SOP code against relevant result/s)

Notes: None



Approved By: Joanne Dewhurst, Operational Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

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Results reported herein relate only to the items supplied to the laboratory for testing.

Results on an Interim Report are not dry-weight corrected.

Where the laboratory is not responsible for the sampling, results apply to the sample(s) as they were received.

The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.



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Results Summary

Report No.: 25-09813-1

Customer Reference: Not Supplied

Customer Order No: 12615

Customer Sample No	10720/S15
RPS Sample No	333265
Sample Matrix	SOLUTION
Sampling Date	06/11/2025

Determinand	CAS No	Codes	SOP	RL	Units	
volume of sample supplied		U	N/A	n/a	ml	106
hydrogen chloride	7647-01-0	UM	C27	0.05	ug/mL	< 0.05

Deviating Samples

Report No.: 25-09813-1

Customer Reference: Not Supplied

Customer Order No: 12615

Our policy on Deviating Samples has been implemented in accordance with UKAS Policy on Deviating Samples (TPS63).
 RPS is not responsible for the integrity of samples as received, unless RPS personnel performed the sampling. Samples submitted may be declared to be deviating.
 Where applicable the analysis method remains UKAS accredited, however results reported for a deviating sample may be compromised.
 Where no sampling date was supplied, samples have been declared to be deviating. If the date can be supplied, results may be reissued if assessed not deviating.
 Where the sample container used was unsuitable or broken, the sample is flagged as deviating and re-sampling/re-submission may be required.

RPS No.	Customer No.	Customer ID	Date Sampled	Containers Received	Deviating	Reason for Deviation
333265	10720/S15		06/11/2025	Container	No	

Report No.: 25-09813-1

Key Code	Description
N	Not Accredited Test
U	UKAS Accredited Test - UKAS accreditation is only implied if the report carries the UKAS logo
UF	UKAS Flexible Scope Test
M	MCERTS Accredited Test - MCERTS accreditation is only implied if the report carries the MCERTS logo
O	Marine Management Organisation (MMO) Validated
SN	Subcontracted to approved laboratory not accredited for the test
SU	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
SIN	Subcontracted to internal RPS Group laboratory not accredited for the test
SIU	Subcontracted to internal RPS Group laboratory UKAS Accredited for the test
SIM	Subcontracted to internal RPS Group laboratory MCERTS/UKAS Accredited for the test
I/S (in results)	Insufficient Sample
U/S (in results)	Unsuitable Sample
S/C (in results)	See Comments
ND (in results)	Not Detected
L (in results)	Result is outside normal limits

Please note that all samples will be destroyed 4 WEEKS after the report has been issued.

Note: Sample retention may be subject to agreement with the customer for particular projects

Certificate Notes	Description
Note 1	This test report shall not be reproduced except in full, without written approval of the Laboratory.
Note 2	Unless otherwise stated, results are not corrected for analytical recoveries.
Note 3	Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied.
Note 4	Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
Note 5	Unless otherwise stated, method D9 conditioning temperatures are 180°C for pre-weigh and 160°C for re-weigh. The PDF version of the certificate is the definitive copy and the Excel version is uncontrolled and provided for information only.
Note 6	

Note: Where the following information is included in this certificate, it has usually been supplied by the customer: Customer Sample ID, Sample Location, Sampling Date and Sample Air Volumes. The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.

Report No.: 25-09813-1

Determinand	CAS No	Media	SOP	% Recovery	% Uncertainty
acetaldehyde	75-07-0	tube	A40	98	16.2
benzaldehyde	100-52-7	tube	A40	100	19.4
butyraldehyde	123-72-8	tube	A40	92	11.5
formaldehyde	50-00-0	tube	A40	97	12.8
hexanal	66-25-1	tube	A40	89	11
propionaldehyde	123-38-6	tube	A40	96	12.6
valeraldehyde	110-62-3	tube	A40	93	12.3
ammonia	7664-41-7	sulphuric acid solution	A6	n/a	8.9
chlorine	7782-50-5	sodium hydroxide solution	C27	n/a	15.2
hydrogen bromide	10035-10-6	sulphuric acid solution	C27	n/a	10.9
hydrogen chloride	7647-01-0	deionised water	C27	n/a	7.9
hydrogen chloride	7647-01-0	sulphuric acid solution	C27	n/a	13.3
hydrogen fluoride	7664-3-3	sodium hydroxide solution	C27	n/a	7.9
sulphur dioxide	7446-09-5	hydrogen peroxide solution	C27	n/a	7.7
nitrogen oxide	10102-43-9	potassium permanganate solution	C27	n/a	11.7
particulates	n/a	filter	D9	n/a	12.2
particulates	n/a	wash solution	D9	n/a	14.8
formaldehyde	50-00-0	deionised water	M103	n/a	23.7
2,4- & 2,6-toluene diisocyanate (TDI)	n/a	filter	M119	n/a	8.6
hexamethylene diisocyanate (HDI)	822-06-0	filter	M119	n/a	5.6
methylene diphenyl diisocyanate (MDI)	101-68-8	filter	M119	n/a	11.8
hydrogen sulphide	7783-06-4	zinc acetate solution	M120	n/a	4.2
antimony	7440-36-0	filter	M31	n/a	10.3
arsenic	7440-38-2	filter	M31	n/a	17.1
cadmium	7440-43-9	filter	M31	n/a	12.1
chromium	7440-47-3	filter	M31	n/a	17.1
cobalt	7440-48-4	filter	M31	n/a	13.1
copper	7440-50-8	filter	M31	n/a	14
lead	7439-92-1	filter	M31	n/a	9.8
manganese	7439-96-5	filter	M31	n/a	17.5
nickel	7440-02-0	filter	M31	n/a	14.4
thallium	7440-28-0	filter	M31	n/a	15.3
tin	7440-31-5	filter	M31	n/a	18.5
vanadium	7440-62-2	filter	M31	n/a	12.1
zinc	7440-66-6	filter	M31	n/a	15.2
antimony	7440-36-0	nitric acid wash	M31	n/a	10.3
arsenic	7440-38-2	nitric acid wash	M31	n/a	17.1
cadmium	7440-43-9	nitric acid wash	M31	n/a	12.1
chromium	7440-47-3	nitric acid wash	M31	n/a	17.1
cobalt	7440-48-4	nitric acid wash	M31	n/a	13.1
copper	7440-50-8	nitric acid wash	M31	n/a	14
lead	7439-92-1	nitric acid wash	M31	n/a	9.8
manganese	7439-96-5	nitric acid wash	M31	n/a	17.5
nickel	7440-02-0	nitric acid wash	M31	n/a	14.4
selenium	7782-49-2	nitric acid wash	M31	n/a	15.1
thallium	7440-28-0	nitric acid wash	M31	n/a	15.3
tin	7440-31-5	nitric acid wash	M31	n/a	18.5
vanadium	7440-62-2	nitric acid wash	M31	n/a	12.1
zinc	7440-66-6	nitric acid wash	M31	n/a	15.2
antimony	7440-36-0	nitric/peroxide solution	M31	n/a	5.9
arsenic	7440-38-2	nitric/peroxide solution	M31	n/a	6.8
cadmium	7440-43-9	nitric/peroxide solution	M31	n/a	6.3
chromium	7440-47-3	nitric/peroxide solution	M31	n/a	7.2
cobalt	7440-48-4	nitric/peroxide solution	M31	n/a	5.2
copper	7440-50-8	nitric/peroxide solution	M31	n/a	6.8
lead	7439-92-1	nitric/peroxide solution	M31	n/a	8.6
manganese	7439-96-5	nitric/peroxide solution	M31	n/a	9.6
nickel	7440-02-0	nitric/peroxide solution	M31	n/a	5.5
selenium	7782-49-2	nitric/peroxide solution	M31	n/a	8.7
thallium	7440-28-0	nitric/peroxide solution	M31	n/a	7.7
tin	7440-31-5	nitric/peroxide solution	M31	n/a	5.8
vanadium	7440-62-2	nitric/peroxide solution	M31	n/a	6.7
zinc	7440-66-6	nitric/peroxide solution	M31	n/a	11.9
1,2,4-trimethylbenzene	95-63-6	tube	O8	88	8.1
1,3,5-trimethylbenzene	108-67-8	tube	O8	92	7.7
2-ethyltoluene	611-14-3	tube	O8	91	8.4
3- & 4-ethyltoluene	n/a	tube	O8	91	8.4
benzene	71-43-2	tube	O8	90	13.9
butyl acetate	123-86-4	tube	O8	90	10.3
decane	124-18-5	tube	O8	97	6.7
dichloromethane	75-09-2	tube	O8	88	24
ethyl acetate	141-78-6	tube	O8	n/a	n/a
ethyl benzene	100-41-4	tube	O8	92	9.8
heptane	142-82-5	tube	O8	94	10.5
hexane	110-54-3	tube	O8	n/a	n/a
limonene	138-86-3	tube	O8	93	13
m- & p-xylene	n/a	tube	O8	90	9.3
methyl isobutyl ketone (MIBK)	108-10-1	tube	O8	86	10
methyl tert-butyl ether (MTBE)	1634-04-4	tube	O8	92	15
o-xylene	95-47-6	tube	O8	86	9.9
propylbenzene	103-65-1	tube	O8	92	7.5
tetrachloroethylene	127-18-4	tube	O8	91	9.3
tetrahydrofuran (THF)	109-99-9	tube	O8	87	14.7
toluene	108-88-3	tube	O8	89	10.7
trichloroethylene	79-01-6	tube	O8	91	10.6
m- & p-cresol	n/a	tube	P1	n/a	11
m- & p-xylenol	n/a	tube	P1	n/a	11.9
o-cresol	95-48-7	tube	P1	n/a	10.8
o-xylenol	526-75-0	tube	P1	n/a	12
phenol	108-95-2	tube	P1	n/a	10.4

Certificate of Analysis

Report No.: 25-09814-1

Issue No.: 1

Date of Issue: 20/11/2025

Customer Details: CES Environmental Instruments Ltd, Bretby Business Park, Ashby Road, Burton on Trent, Staffordshire, DE15 0YZ

Customer Contact: Jane Fowkes

Customer Order No.: 12616

Customer Reference: Not Supplied

Quotation Reference: Q25-07745

Description: 6 liquid samples

Date Received: 10/11/2025

Date Started: 11/11/2025

Date Completed: 19/11/2025

Test Methods: Details available on request (refer to SOP code against relevant result/s)

Notes: None



Approved By: Joanne Dewhurst, Operational Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

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Observations and interpretations are outside of the scope of UKAS accreditation.

Results reported herein relate only to the items supplied to the laboratory for testing.

Results on an Interim Report are not dry-weight corrected.

Where the laboratory is not responsible for the sampling, results apply to the sample(s) as they were received.

The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.



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Results Summary

Report No.: 25-09814-1

Customer Reference: Not Supplied

Customer Order No: 12616

Customer Sample No	10720/S16	10720/S17	10720/S18	10720/S19	10720/S20	10720/S21
RPS Sample No	333266	333267	333268	333269	333270	333271
Sample Matrix	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION
Sampling Date	06/11/2025	06/11/2025	06/11/2025	06/11/2025	06/11/2025	06/11/2025

Determinand	CAS No	Codes	SOP	RL	Units	10720/S16	10720/S17	10720/S18	10720/S19	10720/S20	10720/S21
volume of sample supplied		U	N/A	n/a	ml	110	109	107	121	111	110
ammonia	7664-41-7	UM	A6	0.1	ug/mL	< 0.1	< 0.1	< 0.1	4.4	< 0.1	< 0.1

Deviating Samples

Report No.: 25-09814-1

Customer Reference: Not Supplied

Customer Order No: 12616

Our policy on Deviating Samples has been implemented in accordance with UKAS Policy on Deviating Samples (TPS63). RPS is not responsible for the integrity of samples as received, unless RPS personnel performed the sampling. Samples submitted may be declared to be deviating. Where applicable the analysis method remains UKAS accredited, however results reported for a deviating sample may be compromised. Where no sampling date was supplied, samples have been declared to be deviating. If the date can be supplied, results may be reissued if assessed not deviating. Where the sample container used was unsuitable or broken, the sample is flagged as deviating and re-sampling/re-submission may be required.

RPS No.	Customer No.	Customer ID	Date Sampled	Containers Received	Deviating	Reason for Deviation
333266	10720/S16		06/11/2025	Container	No	
333267	10720/S17		06/11/2025	Container	No	
333268	10720/S18		06/11/2025	Container	No	
333269	10720/S19		06/11/2025	Container	No	
333270	10720/S20		06/11/2025	Container	No	
333271	10720/S21		06/11/2025	Container	No	

Report No.: 25-09814-1

Key Code	Description
N	Not Accredited Test
U	UKAS Accredited Test - UKAS accreditation is only implied if the report carries the UKAS logo
UF	UKAS Flexible Scope Test
M	MCERTS Accredited Test - MCERTS accreditation is only implied if the report carries the MCERTS logo
O	Marine Management Organisation (MMO) Validated
SN	Subcontracted to approved laboratory not accredited for the test
SU	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
SIN	Subcontracted to internal RPS Group laboratory not accredited for the test
SIU	Subcontracted to internal RPS Group laboratory UKAS Accredited for the test
SIM	Subcontracted to internal RPS Group laboratory MCERTS/UKAS Accredited for the test
I/S (in results)	Insufficient Sample
U/S (in results)	Unsuitable Sample
S/C (in results)	See Comments
ND (in results)	Not Detected
L (in results)	Result is outside normal limits

Please note that all samples will be destroyed 4 WEEKS after the report has been issued.

Note: Sample retention may be subject to agreement with the customer for particular projects

Certificate Notes	Description
Note 1	This test report shall not be reproduced except in full, without written approval of the Laboratory.
Note 2	Unless otherwise stated, results are not corrected for analytical recoveries.
Note 3	Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied.
Note 4	Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
Note 5	Unless otherwise stated, method D9 conditioning temperatures are 180°C for pre-weigh and 160°C for re-weigh. The PDF version of the certificate is the definitive copy and the Excel version is uncontrolled and provided for information only.
Note 6	

Note: Where the following information is included in this certificate, it has usually been supplied by the customer: Customer Sample ID, Sample Location, Sampling Date and Sample Air Volumes. The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.

Report No.: 25-09814-1

Determinand	CAS No	Media	SOP	% Recovery	% Uncertainty
acetaldehyde	75-07-0	tube	A40	98	16.2
benzaldehyde	100-52-7	tube	A40	100	19.4
butyraldehyde	123-72-8	tube	A40	92	11.5
formaldehyde	50-00-0	tube	A40	97	12.8
hexanal	66-25-1	tube	A40	89	11
propionaldehyde	123-38-6	tube	A40	96	12.6
valeraldehyde	110-62-3	tube	A40	93	12.3
ammonia	7664-41-7	sulphuric acid solution	A6	n/a	8.9
chlorine	7782-50-5	sodium hydroxide solution	C27	n/a	15.2
hydrogen bromide	10035-10-6	sulphuric acid solution	C27	n/a	10.9
hydrogen chloride	7647-01-0	deionised water	C27	n/a	7.9
hydrogen chloride	7647-01-0	sulphuric acid solution	C27	n/a	13.3
hydrogen fluoride	7664-3-3	sodium hydroxide solution	C27	n/a	7.9
sulphur dioxide	7446-09-5	hydrogen peroxide solution	C27	n/a	7.7
nitrogen oxide	10102-43-9	potassium permanganate solution	C27	n/a	11.7
particulates	n/a	filter	D9	n/a	12.2
particulates	n/a	wash solution	D9	n/a	14.8
formaldehyde	50-00-0	deionised water	M103	n/a	23.7
2,4- & 2,6-toluene diisocyanate (TDI)	n/a	filter	M119	n/a	8.6
hexamethylene diisocyanate (HDI)	822-06-0	filter	M119	n/a	5.6
methylene diphenyl diisocyanate (MDI)	101-68-8	filter	M119	n/a	11.8
hydrogen sulphide	7783-06-4	zinc acetate solution	M120	n/a	4.2
antimony	7440-36-0	filter	M31	n/a	10.3
arsenic	7440-38-2	filter	M31	n/a	17.1
cadmium	7440-43-9	filter	M31	n/a	12.1
chromium	7440-47-3	filter	M31	n/a	17.1
cobalt	7440-48-4	filter	M31	n/a	13.1
copper	7440-50-8	filter	M31	n/a	14
lead	7439-92-1	filter	M31	n/a	9.8
manganese	7439-96-5	filter	M31	n/a	17.5
nickel	7440-02-0	filter	M31	n/a	14.4
thallium	7440-28-0	filter	M31	n/a	15.3
tin	7440-31-5	filter	M31	n/a	18.5
vanadium	7440-62-2	filter	M31	n/a	12.1
zinc	7440-66-6	filter	M31	n/a	15.2
antimony	7440-36-0	nitric acid wash	M31	n/a	10.3
arsenic	7440-38-2	nitric acid wash	M31	n/a	17.1
cadmium	7440-43-9	nitric acid wash	M31	n/a	12.1
chromium	7440-47-3	nitric acid wash	M31	n/a	17.1
cobalt	7440-48-4	nitric acid wash	M31	n/a	13.1
copper	7440-50-8	nitric acid wash	M31	n/a	14
lead	7439-92-1	nitric acid wash	M31	n/a	9.8
manganese	7439-96-5	nitric acid wash	M31	n/a	17.5
nickel	7440-02-0	nitric acid wash	M31	n/a	14.4
selenium	7782-49-2	nitric acid wash	M31	n/a	15.1
thallium	7440-28-0	nitric acid wash	M31	n/a	15.3
tin	7440-31-5	nitric acid wash	M31	n/a	18.5
vanadium	7440-62-2	nitric acid wash	M31	n/a	12.1
zinc	7440-66-6	nitric acid wash	M31	n/a	15.2
antimony	7440-36-0	nitric/peroxide solution	M31	n/a	5.9
arsenic	7440-38-2	nitric/peroxide solution	M31	n/a	6.8
cadmium	7440-43-9	nitric/peroxide solution	M31	n/a	6.3
chromium	7440-47-3	nitric/peroxide solution	M31	n/a	7.2
cobalt	7440-48-4	nitric/peroxide solution	M31	n/a	5.2
copper	7440-50-8	nitric/peroxide solution	M31	n/a	6.8
lead	7439-92-1	nitric/peroxide solution	M31	n/a	8.6
manganese	7439-96-5	nitric/peroxide solution	M31	n/a	9.6
nickel	7440-02-0	nitric/peroxide solution	M31	n/a	5.5
selenium	7782-49-2	nitric/peroxide solution	M31	n/a	8.7
thallium	7440-28-0	nitric/peroxide solution	M31	n/a	7.7
tin	7440-31-5	nitric/peroxide solution	M31	n/a	5.8
vanadium	7440-62-2	nitric/peroxide solution	M31	n/a	6.7
zinc	7440-66-6	nitric/peroxide solution	M31	n/a	11.9
1,2,4-trimethylbenzene	95-63-6	tube	O8	88	8.1
1,3,5-trimethylbenzene	108-67-8	tube	O8	92	7.7
2-ethyltoluene	611-14-3	tube	O8	91	8.4
3- & 4-ethyltoluene	n/a	tube	O8	91	8.4
benzene	71-43-2	tube	O8	90	13.9
butyl acetate	123-86-4	tube	O8	90	10.3
decane	124-18-5	tube	O8	97	6.7
dichloromethane	75-09-2	tube	O8	88	24
ethyl acetate	141-78-6	tube	O8	n/a	n/a
ethyl benzene	100-41-4	tube	O8	92	9.8
heptane	142-82-5	tube	O8	94	10.5
hexane	110-54-3	tube	O8	n/a	n/a
limonene	138-86-3	tube	O8	93	13
m- & p-xylene	n/a	tube	O8	90	9.3
methyl isobutyl ketone (MIBK)	108-10-1	tube	O8	86	10
methyl tert-butyl ether (MTBE)	1634-04-4	tube	O8	92	15
o-xylene	95-47-6	tube	O8	86	9.9
propylbenzene	103-65-1	tube	O8	92	7.5
tetrachloroethylene	127-18-4	tube	O8	91	9.3
tetrahydrofuran (THF)	109-99-9	tube	O8	87	14.7
toluene	108-88-3	tube	O8	89	10.7
trichloroethylene	79-01-6	tube	O8	91	10.6
m- & p-cresol	n/a	tube	P1	n/a	11
m- & p-xylenol	n/a	tube	P1	n/a	11.9
o-cresol	95-48-7	tube	P1	n/a	10.8
o-xylenol	526-75-0	tube	P1	n/a	12
phenol	108-95-2	tube	P1	n/a	10.4

Certificate of Analysis

Report No.: 25-09815-1

Issue No.: 1

Date of Issue 20/11/2025

Customer Details: CES Environmental Instruments Ltd, Bretby Business Park, Ashby Road, Burton on Trent, Staffordshire, DE15 0YZ

Customer Contact: Jane Fowkes

Customer Order No.: 12617

Customer Reference: Not Supplied

Quotation Reference: Q25-07745

Description: 1 liquid sample

Date Received: 10/11/2025

Date Started: 11/11/2025

Date Completed: 19/11/2025

Test Methods: Details available on request (refer to SOP code against relevant result/s)

Notes: None



Approved By: Joanne Dewhurst, Operational Manager

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Results Summary

Report No.: 25-09815-1

Customer Reference: Not Supplied

Customer Order No: 12617

Customer Sample No	10720/S22
RPS Sample No	333272
Sample Matrix	SOLUTION
Sampling Date	06/11/2025

Determinand	CAS No	Codes	SOP	RL	Units	
volume of sample supplied		U	N/A	n/a	ml	112
ammonia	7664-41-7	UM	A6	0.1	ug/mL	< 0.1

Deviating Samples

Report No.: 25-09815-1

Customer Reference: Not Supplied

Customer Order No: 12617

Our policy on Deviating Samples has been implemented in accordance with UKAS Policy on Deviating Samples (TPS63). RPS is not responsible for the integrity of samples as received, unless RPS personnel performed the sampling. Samples submitted may be declared to be deviating. Where applicable the analysis method remains UKAS accredited, however results reported for a deviating sample may be compromised. Where no sampling date was supplied, samples have been declared to be deviating. If the date can be supplied, results may be reissued if assessed not deviating. Where the sample container used was unsuitable or broken, the sample is flagged as deviating and re-sampling/re-submission may be required.

RPS No.	Customer No.	Customer ID	Date Sampled	Containers Received	Deviating	Reason for Deviation
333272	10720/S22		06/11/2025	Container	No	

Report No.: 25-09815-1

Key Code	Description
N	Not Accredited Test
U	UKAS Accredited Test - UKAS accreditation is only implied if the report carries the UKAS logo
UF	UKAS Flexible Scope Test
M	MCERTS Accredited Test - MCERTS accreditation is only implied if the report carries the MCERTS logo
O	Marine Management Organisation (MMO) Validated
SN	Subcontracted to approved laboratory not accredited for the test
SU	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
SIN	Subcontracted to internal RPS Group laboratory not accredited for the test
SIU	Subcontracted to internal RPS Group laboratory UKAS Accredited for the test
SIM	Subcontracted to internal RPS Group laboratory MCERTS/UKAS Accredited for the test
I/S (in results)	Insufficient Sample
U/S (in results)	Unsuitable Sample
S/C (in results)	See Comments
ND (in results)	Not Detected
L (in results)	Result is outside normal limits

Please note that all samples will be destroyed 4 WEEKS after the report has been issued.

Note: Sample retention may be subject to agreement with the customer for particular projects

Certificate Notes	Description
Note 1	This test report shall not be reproduced except in full, without written approval of the Laboratory.
Note 2	Unless otherwise stated, results are not corrected for analytical recoveries.
Note 3	Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied.
Note 4	Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
Note 5	Unless otherwise stated, method D9 conditioning temperatures are 180°C for pre-weigh and 160°C for re-weigh. The PDF version of the certificate is the definitive copy and the Excel version is uncontrolled and provided for information only.
Note 6	

Note: Where the following information is included in this certificate, it has usually been supplied by the customer: Customer Sample ID, Sample Location, Sampling Date and Sample Air Volumes. The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.

Report No.: 25-09815-1

Determinand	CAS No	Media	SOP	% Recovery	% Uncertainty
acetaldehyde	75-07-0	tube	A40	98	16.2
benzaldehyde	100-52-7	tube	A40	100	19.4
butyraldehyde	123-72-8	tube	A40	92	11.5
formaldehyde	50-00-0	tube	A40	97	12.8
hexanal	66-25-1	tube	A40	89	11
propionaldehyde	123-38-6	tube	A40	96	12.6
valeraldehyde	110-62-3	tube	A40	93	12.3
ammonia	7664-41-7	sulphuric acid solution	A6	n/a	8.9
chlorine	7782-50-5	sodium hydroxide solution	C27	n/a	15.2
hydrogen bromide	10035-10-6	sulphuric acid solution	C27	n/a	10.9
hydrogen chloride	7647-01-0	deionised water	C27	n/a	7.9
hydrogen chloride	7647-01-0	sulphuric acid solution	C27	n/a	13.3
hydrogen fluoride	7664-3-3	sodium hydroxide solution	C27	n/a	7.9
sulphur dioxide	7446-09-5	hydrogen peroxide solution	C27	n/a	7.7
nitrogen oxide	10102-43-9	potassium permanganate solution	C27	n/a	11.7
particulates	n/a	filter	D9	n/a	12.2
particulates	n/a	wash solution	D9	n/a	14.8
formaldehyde	50-00-0	deionised water	M103	n/a	23.7
2,4- & 2,6-toluene diisocyanate (TDI)	n/a	filter	M119	n/a	8.6
hexamethylene diisocyanate (HDI)	822-06-0	filter	M119	n/a	5.6
methylene diphenyl diisocyanate (MDI)	101-68-8	filter	M119	n/a	11.8
hydrogen sulphide	7783-06-4	zinc acetate solution	M120	n/a	4.2
antimony	7440-36-0	filter	M31	n/a	10.3
arsenic	7440-38-2	filter	M31	n/a	17.1
cadmium	7440-43-9	filter	M31	n/a	12.1
chromium	7440-47-3	filter	M31	n/a	17.1
cobalt	7440-48-4	filter	M31	n/a	13.1
copper	7440-50-8	filter	M31	n/a	14
lead	7439-92-1	filter	M31	n/a	9.8
manganese	7439-96-5	filter	M31	n/a	17.5
nickel	7440-02-0	filter	M31	n/a	14.4
thallium	7440-28-0	filter	M31	n/a	15.3
tin	7440-31-5	filter	M31	n/a	18.5
vanadium	7440-62-2	filter	M31	n/a	12.1
zinc	7440-66-6	filter	M31	n/a	15.2
antimony	7440-36-0	nitric acid wash	M31	n/a	10.3
arsenic	7440-38-2	nitric acid wash	M31	n/a	17.1
cadmium	7440-43-9	nitric acid wash	M31	n/a	12.1
chromium	7440-47-3	nitric acid wash	M31	n/a	17.1
cobalt	7440-48-4	nitric acid wash	M31	n/a	13.1
copper	7440-50-8	nitric acid wash	M31	n/a	14
lead	7439-92-1	nitric acid wash	M31	n/a	9.8
manganese	7439-96-5	nitric acid wash	M31	n/a	17.5
nickel	7440-02-0	nitric acid wash	M31	n/a	14.4
selenium	7782-49-2	nitric acid wash	M31	n/a	15.1
thallium	7440-28-0	nitric acid wash	M31	n/a	15.3
tin	7440-31-5	nitric acid wash	M31	n/a	18.5
vanadium	7440-62-2	nitric acid wash	M31	n/a	12.1
zinc	7440-66-6	nitric acid wash	M31	n/a	15.2
antimony	7440-36-0	nitric/peroxide solution	M31	n/a	5.9
arsenic	7440-38-2	nitric/peroxide solution	M31	n/a	6.8
cadmium	7440-43-9	nitric/peroxide solution	M31	n/a	6.3
chromium	7440-47-3	nitric/peroxide solution	M31	n/a	7.2
cobalt	7440-48-4	nitric/peroxide solution	M31	n/a	5.2
copper	7440-50-8	nitric/peroxide solution	M31	n/a	6.8
lead	7439-92-1	nitric/peroxide solution	M31	n/a	8.6
manganese	7439-96-5	nitric/peroxide solution	M31	n/a	9.6
nickel	7440-02-0	nitric/peroxide solution	M31	n/a	5.5
selenium	7782-49-2	nitric/peroxide solution	M31	n/a	8.7
thallium	7440-28-0	nitric/peroxide solution	M31	n/a	7.7
tin	7440-31-5	nitric/peroxide solution	M31	n/a	5.8
vanadium	7440-62-2	nitric/peroxide solution	M31	n/a	6.7
zinc	7440-66-6	nitric/peroxide solution	M31	n/a	11.9
1,2,4-trimethylbenzene	95-63-6	tube	O8	88	8.1
1,3,5-trimethylbenzene	108-67-8	tube	O8	92	7.7
2-ethyltoluene	611-14-3	tube	O8	91	8.4
3- & 4-ethyltoluene	n/a	tube	O8	91	8.4
benzene	71-43-2	tube	O8	90	13.9
butyl acetate	123-86-4	tube	O8	90	10.3
decane	124-18-5	tube	O8	97	6.7
dichloromethane	75-09-2	tube	O8	88	24
ethyl acetate	141-78-6	tube	O8	n/a	n/a
ethyl benzene	100-41-4	tube	O8	92	9.8
heptane	142-82-5	tube	O8	94	10.5
hexane	110-54-3	tube	O8	n/a	n/a
limonene	138-86-3	tube	O8	93	13
m- & p-xylene	n/a	tube	O8	90	9.3
methyl isobutyl ketone (MIBK)	108-10-1	tube	O8	86	10
methyl tert-butyl ether (MTBE)	1634-04-4	tube	O8	92	15
o-xylene	95-47-6	tube	O8	86	9.9
propylbenzene	103-65-1	tube	O8	92	7.5
tetrachloroethylene	127-18-4	tube	O8	91	9.3
tetrahydrofuran (THF)	109-99-9	tube	O8	87	14.7
toluene	108-88-3	tube	O8	89	10.7
trichloroethylene	79-01-6	tube	O8	91	10.6
m- & p-cresol	n/a	tube	P1	n/a	11
m- & p-xylenol	n/a	tube	P1	n/a	11.9
o-cresol	95-48-7	tube	P1	n/a	10.8
o-xylenol	526-75-0	tube	P1	n/a	12
phenol	108-95-2	tube	P1	n/a	10.4

Certificate of Analysis

Report No.: 25-09816-1

Issue No.: 1

Date of Issue: 21/11/2025

Customer Details: CES Environmental Instruments Ltd, Bretby Business Park, Ashby Road, Burton on Trent, Staffordshire, DE15 0YZ

Customer Contact: Jane Fowkes

Customer Order No.: 12612

Customer Reference: Not Supplied

Quotation Reference: Q25-07745

Description: 5 liquid samples, 2 solid samples

Date Received: 10/11/2025

Date Started: 11/11/2025

Date Completed: 21/11/2025

Test Methods: Details available on request (refer to SOP code against relevant result/s)

Notes: None



Approved By: Joanne Dewhurst, Operational Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

This certificate shall not be reproduced except in full without the prior written approval of the laboratory.

Observations and interpretations are outside of the scope of UKAS accreditation.

Results reported herein relate only to the items supplied to the laboratory for testing.

Results on an Interim Report are not dry-weight corrected.

Where the laboratory is not responsible for the sampling, results apply to the sample(s) as they were received.

The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.



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Results Summary

Report No.: 25-09816-1

Customer Reference: Not Supplied

Customer Order No: 12612

Customer Sample No	10720/S1	10720/S2	10720/S3	10720/S4	10720/S5	10720/S6A	10720/S6B
RPS Sample No	333273	333274	333275	333276	333277	333278	333279
Sample Matrix	SOLUTION	SOLUTION	FILTER	SOLUTION	SOLUTION	SOLUTION	FILTER
Sampling Date	06/11/2025	06/11/2025	06/11/2025	06/11/2025	06/11/2025	06/11/2025	06/11/2025

Determinand	CAS No	Codes	SOP	RL	Units						
volume of sample supplied		U	N/A	n/a	ml	214	109		211	119	120
nickel	7440-02-0	UM	M31	0.5	ug			< 0.5			1.4
nickel	7440-02-0	UM	M31	0.1	ug						< 0.1
nickel	7440-02-0	UM	M31	0.3	ug/L	< 0.3	< 0.3		7.0	< 0.3	

Deviating Samples

Report No.: 25-09816-1

Customer Reference: Not Supplied

Customer Order No: 12612

Our policy on Deviating Samples has been implemented in accordance with UKAS Policy on Deviating Samples (TPS63).
 RPS is not responsible for the integrity of samples as received, unless RPS personnel performed the sampling. Samples submitted may be declared to be deviating.
 Where applicable the analysis method remains UKAS accredited, however results reported for a deviating sample may be compromised.
 Where no sampling date was supplied, samples have been declared to be deviating. If the date can be supplied, results may be reissued if assessed not deviating.
 Where the sample container used was unsuitable or broken, the sample is flagged as deviating and re-sampling/re-submission may be required.

RPS No.	Customer No.	Customer ID	Date Sampled	Containers Received	Deviating	Reason for Deviation
333273	10720/S1		06/11/2025	Container	No	
333274	10720/S2		06/11/2025	Container	No	
333275	10720/S3		06/11/2025	Container	No	
333276	10720/S4		06/11/2025	Container	No	
333277	10720/S5		06/11/2025	Container	No	
333278	10720/S6A		06/11/2025	Container	No	
333279	10720/S6B		06/11/2025	Container	No	

Report No.: 25-09816-1

Key Code	Description
N	Not Accredited Test
U	UKAS Accredited Test - UKAS accreditation is only implied if the report carries the UKAS logo
UF	UKAS Flexible Scope Test
M	MCERTS Accredited Test - MCERTS accreditation is only implied if the report carries the MCERTS logo
O	Marine Management Organisation (MMO) Validated
SN	Subcontracted to approved laboratory not accredited for the test
SU	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
SIN	Subcontracted to internal RPS Group laboratory not accredited for the test
SIU	Subcontracted to internal RPS Group laboratory UKAS Accredited for the test
SIM	Subcontracted to internal RPS Group laboratory MCERTS/UKAS Accredited for the test
I/S (in results)	Insufficient Sample
U/S (in results)	Unsuitable Sample
S/C (in results)	See Comments
ND (in results)	Not Detected
L (in results)	Result is outside normal limits

Please note that all samples will be destroyed 4 WEEKS after the report has been issued.

Note: Sample retention may be subject to agreement with the customer for particular projects

Certificate Notes	Description
Note 1	This test report shall not be reproduced except in full, without written approval of the Laboratory.
Note 2	Unless otherwise stated, results are not corrected for analytical recoveries.
Note 3	Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied.
Note 4	Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
Note 5	Unless otherwise stated, method D9 conditioning temperatures are 180°C for pre-weigh and 160°C for re-weigh. The PDF version of the certificate is the definitive copy and the Excel version is uncontrolled and provided for information only.
Note 6	

Note: Where the following information is included in this certificate, it has usually been supplied by the customer: Customer Sample ID, Sample Location, Sampling Date and Sample Air Volumes. The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.

Report No.: 25-09816-1

Determinand	CAS No	Media	SOP	% Recovery	% Uncertainty
acetaldehyde	75-07-0	tube	A40	98	16.2
benzaldehyde	100-52-7	tube	A40	100	19.4
butyraldehyde	123-72-8	tube	A40	92	11.5
formaldehyde	50-00-0	tube	A40	97	12.8
hexanal	66-25-1	tube	A40	89	11
propionaldehyde	123-38-6	tube	A40	96	12.6
valeraldehyde	110-62-3	tube	A40	93	12.3
ammonia	7664-41-7	sulphuric acid solution	A6	n/a	8.9
chlorine	7782-50-5	sodium hydroxide solution	C27	n/a	15.2
hydrogen bromide	10035-10-6	sulphuric acid solution	C27	n/a	10.9
hydrogen chloride	7647-01-0	deionised water	C27	n/a	7.9
hydrogen chloride	7647-01-0	sulphuric acid solution	C27	n/a	13.3
hydrogen fluoride	7664-3-3	sodium hydroxide solution	C27	n/a	7.9
sulphur dioxide	7446-09-5	hydrogen peroxide solution	C27	n/a	7.7
nitrogen oxide	10102-43-9	potassium permanganate solution	C27	n/a	11.7
particulates	n/a	filter	D9	n/a	12.2
particulates	n/a	wash solution	D9	n/a	14.8
formaldehyde	50-00-0	deionised water	M103	n/a	23.7
2,4- & 2,6-toluene diisocyanate (TDI)	n/a	filter	M119	n/a	8.6
hexamethylene diisocyanate (HDI)	822-06-0	filter	M119	n/a	5.6
methylene diphenyl diisocyanate (MDI)	101-68-8	filter	M119	n/a	11.8
hydrogen sulphide	7783-06-4	zinc acetate solution	M120	n/a	4.2
antimony	7440-36-0	filter	M31	n/a	10.3
arsenic	7440-38-2	filter	M31	n/a	17.1
cadmium	7440-43-9	filter	M31	n/a	12.1
chromium	7440-47-3	filter	M31	n/a	17.1
cobalt	7440-48-4	filter	M31	n/a	13.1
copper	7440-50-8	filter	M31	n/a	14
lead	7439-92-1	filter	M31	n/a	9.8
manganese	7439-96-5	filter	M31	n/a	17.5
nickel	7440-02-0	filter	M31	n/a	14.4
thallium	7440-28-0	filter	M31	n/a	15.3
tin	7440-31-5	filter	M31	n/a	18.5
vanadium	7440-62-2	filter	M31	n/a	12.1
zinc	7440-66-6	filter	M31	n/a	15.2
antimony	7440-36-0	nitric acid wash	M31	n/a	10.3
arsenic	7440-38-2	nitric acid wash	M31	n/a	17.1
cadmium	7440-43-9	nitric acid wash	M31	n/a	12.1
chromium	7440-47-3	nitric acid wash	M31	n/a	17.1
cobalt	7440-48-4	nitric acid wash	M31	n/a	13.1
copper	7440-50-8	nitric acid wash	M31	n/a	14
lead	7439-92-1	nitric acid wash	M31	n/a	9.8
manganese	7439-96-5	nitric acid wash	M31	n/a	17.5
nickel	7440-02-0	nitric acid wash	M31	n/a	14.4
selenium	7782-49-2	nitric acid wash	M31	n/a	15.1
thallium	7440-28-0	nitric acid wash	M31	n/a	15.3
tin	7440-31-5	nitric acid wash	M31	n/a	18.5
vanadium	7440-62-2	nitric acid wash	M31	n/a	12.1
zinc	7440-66-6	nitric acid wash	M31	n/a	15.2
antimony	7440-36-0	nitric/peroxide solution	M31	n/a	5.9
arsenic	7440-38-2	nitric/peroxide solution	M31	n/a	6.8
cadmium	7440-43-9	nitric/peroxide solution	M31	n/a	6.3
chromium	7440-47-3	nitric/peroxide solution	M31	n/a	7.2
cobalt	7440-48-4	nitric/peroxide solution	M31	n/a	5.2
copper	7440-50-8	nitric/peroxide solution	M31	n/a	6.8
lead	7439-92-1	nitric/peroxide solution	M31	n/a	8.6
manganese	7439-96-5	nitric/peroxide solution	M31	n/a	9.6
nickel	7440-02-0	nitric/peroxide solution	M31	n/a	5.5
selenium	7782-49-2	nitric/peroxide solution	M31	n/a	8.7
thallium	7440-28-0	nitric/peroxide solution	M31	n/a	7.7
tin	7440-31-5	nitric/peroxide solution	M31	n/a	5.8
vanadium	7440-62-2	nitric/peroxide solution	M31	n/a	6.7
zinc	7440-66-6	nitric/peroxide solution	M31	n/a	11.9
1,2,4-trimethylbenzene	95-63-6	tube	O8	88	8.1
1,3,5-trimethylbenzene	108-67-8	tube	O8	92	7.7
2-ethyltoluene	611-14-3	tube	O8	91	8.4
3- & 4-ethyltoluene	n/a	tube	O8	91	8.4
benzene	71-43-2	tube	O8	90	13.9
butyl acetate	123-86-4	tube	O8	90	10.3
decane	124-18-5	tube	O8	97	6.7
dichloromethane	75-09-2	tube	O8	88	24
ethyl acetate	141-78-6	tube	O8	n/a	n/a
ethyl benzene	100-41-4	tube	O8	92	9.8
heptane	142-82-5	tube	O8	94	10.5
hexane	110-54-3	tube	O8	n/a	n/a
limonene	138-86-3	tube	O8	93	13
m- & p-xylene	n/a	tube	O8	90	9.3
methyl isobutyl ketone (MIBK)	108-10-1	tube	O8	86	10
methyl tert-butyl ether (MTBE)	1634-04-4	tube	O8	92	15
o-xylene	95-47-6	tube	O8	86	9.9
propylbenzene	103-65-1	tube	O8	92	7.5
tetrachloroethylene	127-18-4	tube	O8	91	9.3
tetrahydrofuran (THF)	109-99-9	tube	O8	87	14.7
toluene	108-88-3	tube	O8	89	10.7
trichloroethylene	79-01-6	tube	O8	91	10.6
m- & p-cresol	n/a	tube	P1	n/a	11
m- & p-xylenol	n/a	tube	P1	n/a	11.9
o-cresol	95-48-7	tube	P1	n/a	10.8
o-xylenol	526-75-0	tube	P1	n/a	12
phenol	108-95-2	tube	P1	n/a	10.4

Certificate of Analysis

Report No.: 25-09817-1

Issue No.: 1

Date of Issue: 21/11/2025

Customer Details: CES Environmental Instruments Ltd, Bretby Business Park, Ashby Road, Burton on Trent, Staffordshire, DE15 0YZ

Customer Contact: Jane Fowkes

Customer Order No.: 12613

Customer Reference: Not Supplied

Quotation Reference: Q25-07745

Description: 1 liquid sample, 1 solid sample

Date Received: 10/11/2025

Date Started: 11/11/2025

Date Completed: 21/11/2025

Test Methods: Details available on request (refer to SOP code against relevant result/s)

Notes: None



Approved By: Joanne Dewhurst, Operational Manager

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Where the laboratory is not responsible for the sampling, results apply to the sample(s) as they were received.

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Results Summary

Report No.: 25-09817-1

Customer Reference: Not Supplied

Customer Order No: 12613

Customer Sample No	10720/S7	10720/S8
RPS Sample No	333280	333281
Sample Matrix	SOLUTION	FILTER
Sampling Date	06/11/2025	06/11/2025

Determinand	CAS No	Codes	SOP	RL	Units		
volume of sample supplied		U	N/A	n/a	ml	109	
nickel	7440-02-0	UM	M31	0.5	ug		< 0.5
nickel	7440-02-0	UM	M31	0.3	ug/L	< 0.3	

Deviating Samples

Report No.: 25-09817-1

Customer Reference: Not Supplied

Customer Order No: 12613

Our policy on Deviating Samples has been implemented in accordance with UKAS Policy on Deviating Samples (TPS63).
 RPS is not responsible for the integrity of samples as received, unless RPS personnel performed the sampling. Samples submitted may be declared to be deviating.
 Where applicable the analysis method remains UKAS accredited, however results reported for a deviating sample may be compromised.
 Where no sampling date was supplied, samples have been declared to be deviating. If the date can be supplied, results may be reissued if assessed not deviating.
 Where the sample container used was unsuitable or broken, the sample is flagged as deviating and re-sampling/re-submission may be required.

RPS No.	Customer No.	Customer ID	Date Sampled	Containers Received	Deviating	Reason for Deviation
333280	10720/S7		06/11/2025	Container	No	
333281	10720/S8		06/11/2025	Container	No	

Report No.: 25-09817-1

Key Code	Description
N	Not Accredited Test
U	UKAS Accredited Test - UKAS accreditation is only implied if the report carries the UKAS logo
UF	UKAS Flexible Scope Test
M	MCERTS Accredited Test - MCERTS accreditation is only implied if the report carries the MCERTS logo
O	Marine Management Organisation (MMO) Validated
SN	Subcontracted to approved laboratory not accredited for the test
SU	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
SIN	Subcontracted to internal RPS Group laboratory not accredited for the test
SIU	Subcontracted to internal RPS Group laboratory UKAS Accredited for the test
SIM	Subcontracted to internal RPS Group laboratory MCERTS/UKAS Accredited for the test
I/S (in results)	Insufficient Sample
U/S (in results)	Unsuitable Sample
S/C (in results)	See Comments
ND (in results)	Not Detected
L (in results)	Result is outside normal limits

Please note that all samples will be destroyed 4 WEEKS after the report has been issued.

Note: Sample retention may be subject to agreement with the customer for particular projects

Certificate Notes	Description
Note 1	This test report shall not be reproduced except in full, without written approval of the Laboratory.
Note 2	Unless otherwise stated, results are not corrected for analytical recoveries.
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Note 6	

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Report No.: 25-09817-1

Determinand	CAS No	Media	SOP	% Recovery	% Uncertainty
acetaldehyde	75-07-0	tube	A40	98	16.2
benzaldehyde	100-52-7	tube	A40	100	19.4
butyraldehyde	123-72-8	tube	A40	92	11.5
formaldehyde	50-00-0	tube	A40	97	12.8
hexanal	66-25-1	tube	A40	89	11
propionaldehyde	123-38-6	tube	A40	96	12.6
valeraldehyde	110-62-3	tube	A40	93	12.3
ammonia	7664-41-7	sulphuric acid solution	A6	n/a	8.9
chlorine	7782-50-5	sodium hydroxide solution	C27	n/a	15.2
hydrogen bromide	10035-10-6	sulphuric acid solution	C27	n/a	10.9
hydrogen chloride	7647-01-0	deionised water	C27	n/a	7.9
hydrogen chloride	7647-01-0	sulphuric acid solution	C27	n/a	13.3
hydrogen fluoride	7664-3-3	sodium hydroxide solution	C27	n/a	7.9
sulphur dioxide	7446-09-5	hydrogen peroxide solution	C27	n/a	7.7
nitrogen oxide	10102-43-9	potassium permanganate solution	C27	n/a	11.7
particulates	n/a	filter	D9	n/a	12.2
particulates	n/a	wash solution	D9	n/a	14.8
formaldehyde	50-00-0	deionised water	M103	n/a	23.7
2,4- & 2,6-toluene diisocyanate (TDI)	n/a	filter	M119	n/a	8.6
hexamethylene diisocyanate (HDI)	822-06-0	filter	M119	n/a	5.6
methylene diphenyl diisocyanate (MDI)	101-68-8	filter	M119	n/a	11.8
hydrogen sulphide	7783-06-4	zinc acetate solution	M120	n/a	4.2
antimony	7440-36-0	filter	M31	n/a	10.3
arsenic	7440-38-2	filter	M31	n/a	17.1
cadmium	7440-43-9	filter	M31	n/a	12.1
chromium	7440-47-3	filter	M31	n/a	17.1
cobalt	7440-48-4	filter	M31	n/a	13.1
copper	7440-50-8	filter	M31	n/a	14
lead	7439-92-1	filter	M31	n/a	9.8
manganese	7439-96-5	filter	M31	n/a	17.5
nickel	7440-02-0	filter	M31	n/a	14.4
thallium	7440-28-0	filter	M31	n/a	15.3
tin	7440-31-5	filter	M31	n/a	18.5
vanadium	7440-62-2	filter	M31	n/a	12.1
zinc	7440-66-6	filter	M31	n/a	15.2
antimony	7440-36-0	nitric acid wash	M31	n/a	10.3
arsenic	7440-38-2	nitric acid wash	M31	n/a	17.1
cadmium	7440-43-9	nitric acid wash	M31	n/a	12.1
chromium	7440-47-3	nitric acid wash	M31	n/a	17.1
cobalt	7440-48-4	nitric acid wash	M31	n/a	13.1
copper	7440-50-8	nitric acid wash	M31	n/a	14
lead	7439-92-1	nitric acid wash	M31	n/a	9.8
manganese	7439-96-5	nitric acid wash	M31	n/a	17.5
nickel	7440-02-0	nitric acid wash	M31	n/a	14.4
selenium	7782-49-2	nitric acid wash	M31	n/a	15.1
thallium	7440-28-0	nitric acid wash	M31	n/a	15.3
tin	7440-31-5	nitric acid wash	M31	n/a	18.5
vanadium	7440-62-2	nitric acid wash	M31	n/a	12.1
zinc	7440-66-6	nitric acid wash	M31	n/a	15.2
antimony	7440-36-0	nitric/peroxide solution	M31	n/a	5.9
arsenic	7440-38-2	nitric/peroxide solution	M31	n/a	6.8
cadmium	7440-43-9	nitric/peroxide solution	M31	n/a	6.3
chromium	7440-47-3	nitric/peroxide solution	M31	n/a	7.2
cobalt	7440-48-4	nitric/peroxide solution	M31	n/a	5.2
copper	7440-50-8	nitric/peroxide solution	M31	n/a	6.8
lead	7439-92-1	nitric/peroxide solution	M31	n/a	8.6
manganese	7439-96-5	nitric/peroxide solution	M31	n/a	9.6
nickel	7440-02-0	nitric/peroxide solution	M31	n/a	5.5
selenium	7782-49-2	nitric/peroxide solution	M31	n/a	8.7
thallium	7440-28-0	nitric/peroxide solution	M31	n/a	7.7
tin	7440-31-5	nitric/peroxide solution	M31	n/a	5.8
vanadium	7440-62-2	nitric/peroxide solution	M31	n/a	6.7
zinc	7440-66-6	nitric/peroxide solution	M31	n/a	11.9
1,2,4-trimethylbenzene	95-63-6	tube	O8	88	8.1
1,3,5-trimethylbenzene	108-67-8	tube	O8	92	7.7
2-ethyltoluene	611-14-3	tube	O8	91	8.4
3- & 4-ethyltoluene	n/a	tube	O8	91	8.4
benzene	71-43-2	tube	O8	90	13.9
butyl acetate	123-86-4	tube	O8	90	10.3
decane	124-18-5	tube	O8	97	6.7
dichloromethane	75-09-2	tube	O8	88	24
ethyl acetate	141-78-6	tube	O8	n/a	n/a
ethyl benzene	100-41-4	tube	O8	92	9.8
heptane	142-82-5	tube	O8	94	10.5
hexane	110-54-3	tube	O8	n/a	n/a
limonene	138-86-3	tube	O8	93	13
m- & p-xylene	n/a	tube	O8	90	9.3
methyl isobutyl ketone (MIBK)	108-10-1	tube	O8	86	10
methyl tert-butyl ether (MTBE)	1634-04-4	tube	O8	92	15
o-xylene	95-47-6	tube	O8	86	9.9
propylbenzene	103-65-1	tube	O8	92	7.5
tetrachloroethylene	127-18-4	tube	O8	91	9.3
tetrahydrofuran (THF)	109-99-9	tube	O8	87	14.7
toluene	108-88-3	tube	O8	89	10.7
trichloroethylene	79-01-6	tube	O8	91	10.6
m- & p-cresol	n/a	tube	P1	n/a	11
m- & p-xylenol	n/a	tube	P1	n/a	11.9
o-cresol	95-48-7	tube	P1	n/a	10.8
o-xylenol	526-75-0	tube	P1	n/a	12
phenol	108-95-2	tube	P1	n/a	10.4

Appendix 6
Calibration Certificates

Certificate of Calibration

Date of Issue: 9th September 2024

Certificate No. CES2673
Page 1 of 2

CES Environmental Instruments Ltd
Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel: 01283 216334 Fax: 01283 550939



Certified By

Instrument Details

Instrument Type	Manual Sample Train
Instrument Make	Apex
Instrument Serial No.	1303012
Dry Gas Meter Serial No.	2012-014440
Quality No.	C286
Calibration Date	09 09 25
Calibrated By Name	D.Woolley

Ambient Conditions

Air Temperature (°C)	23
Relative Humidity (%)	65
Barometric Pressure P_b	752.3 mm Hg 1003 mbar

Instruments used to undertake calibration

Manometer Type FC012	UKAS Certificate No. 29299	(Qu. No. C082)
Manometer Type FC012	UKAS Certificate No. 27300	(Qu. No. C081)
Barometer Type 104	UKAS Certificate No. K55933P	(Qu. No. C138)
RIS Supercal XT	UKAS Certificate No. 10345	(Qu. No. C014)
Gallus Dry Gas Meter	UKAS Certificate No. N039726	(Qu. No. C333)

Pressure Measurement

The instrument under test provides an indication by means of a liquid manometer corresponding to an applied pressure. The liquid manometer was calibrated against a FCO12 Digital Micromanometer whose calibration is traceable to UKAS standards. The readings of the reference instrument and the instrument under test were taken simultaneously and compared.

Dry Gas Meter Calibration

A calibrated dry gas meter was connected to the sampling inlet of the Control Unit. A volume of air is pulled through the sampling system. The measured value shown on the calibrated dry gas meter is then compared to the indicated value on the dry gas meter contained within the control unit.

Temperature Calibration

The instrument under test provides an indication by means of an Electronic Display corresponding to an applied simulated temperature. The Display was calibrated against a reference temperature instrument whose calibration is traceable to UKAS standards. The readings of the reference instrument and the instrument under test were taken simultaneously and compared.

Certificate of Calibration

Date of Issue: 9th September 2025

Certificate No. CES2673
page 2 of 2

CES Environmental Instruments Ltd
Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel: 01283 216334 Fax: 01283 550939


Certified By

Instrument Details

Instrument Type
Instrument Make
Instrument Serial No
Dry Gas Meter Serial No
Quality No
Calibration Date

Manual Sample Train
Andersen
1303012
2012-014440
C286
09 09 25

Ambient Conditions

Air Temperature (°C) 23
Relative Humidity (%) 65
Barometric Pressure (P_b) 752.3 mm Hg
1003 mbar

Calibration Details

Orifice manometer setting	Calibrated Dry Gas Meter	Dry Gas Meter (UUT) Volume	Uncertainty Volume (l) ±	Temperatures				Time min
				Calibrated Gas Meter Temp	Inlet t _i	Dry Gas Outlet t _o	Average t _m	
0.3	35.0	35.2	0.7	24.0	24.0	24.0	24.0	20.0
15	242.8	259.2	4.6	22.0	25.0	25.0	25.0	20.0
25	314.0	335.4	5.9	22.0	24.0	24.0	24.0	20.0
50	440.9	470.2	8.3	23.0	28.0	28.0	28.0	20.0
100	654.2	680.4	12.3	24.0	28.0	28.0	28.0	20.0

ΔH setting mm H ₂ O @ 5"Hg	V		ΔH@	
	V _w P _b (t _m + 273)	[P _b + (ΔH + 13.6)] (t _w + 273)	1170 ΔH P _b (t _b + 273)	$\left[\frac{(T_w + 273)}{V_w} \right]^2$
0.3	0.9943			45.2470
15	0.9853			46.2242
25	0.9894			46.2186
50	0.9667			46.5752
100	0.9775			42.5964
Average	0.9826			45.3723
As Found	0.9773			44.8958

Manometer 1 (ΔH)					Manometer 2 (ΔP)				
Required Pressure mmH ₂ O/Pa	Reference Pressure Pa	Reference Pressure mmH ₂ O	Display Pressure mmH ₂ O (ΔH)	Uncertainty mmH ₂ O =	Required Pressure mmH ₂ O/Pa	Reference Pressure Pa	Reference Pressure mmH ₂ O	Display Pressure mmH ₂ O (ΔP)	Uncertainty mmH ₂ O =
0.0 / 0.0	0.0	0.0	0.0	0.00	0.0 / 0.0	0.0	0.0	0.0	0.00
5.0 / 49.0	49.0	5.0	5.0	0.60	5.0 / 49.0	49.0	5.0	5.0	0.60
10.0 / 98.1	98.1	10.0	10.0	0.76	10.0 / 98.1	98.1	10.0	10.0	0.76
15.0 / 147.1	147.1	15.0	15.0	1.06	15.0 / 147.1	147.1	15.0	15.0	1.06
20.0 / 196.1	196.1	20.0	20.0	1.10	20.0 / 196.1	196.1	20.0	20.0	1.10
25.0 / 245.2	245.2	25.0	25.0	1.50	25.0 / 245.2	245.2	25.0	25.0	1.50
50.0 / 490.3	490.3	50.0	50.0	2.20	50.0 / 490.3	490.3	50.0	50.0	2.20
100.0 / 980.1	980.1	100.0	100.0	2.20	100.0 / 980.1	980.1	100.0	100.0	2.20
150.0 / 1471.0	1471.0	150.0	150.0	3.60	150.0 / 1471.0	1471.0	150.0	150.0	3.60
200.0 / 1961.3	1961.3	200.0	200.0	4.50	200.0 / 1961.3	1961.3	200.0	200.0	4.50
250.0 / 2451.1	2451.1	250.0	250.0	4.70	250.0 / 2451.1	2451.1	250.0	250.0	4.70

Test °C	Display 1 °C	Display 2 °C	Display 3 °C	Display 4 °C	Display 5 °C	Display 6 °C	Display 7 °C	Uncertainty °C
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	0.37
50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	0.93
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	2.13
200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	4.05
300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	5.80
700.0	700.0	700.0	700.0	700.0	700.0	700.0	700.0	13.13

Appendix 7

Uncertainty Calculations

Uncertainty calculation for BS EN 1911 : 1998 Manual Method of Determination of HCl , Reference method

Measurement Equation

$$c = \frac{m}{V} f_c$$

Limit value (ELV)		mg.m ⁻³	Reference oxygen		% by volume
Measured concentration	0.0	mg.m ⁻³ (at reference conditions)			

Measured Quantities	Symbol	Value	Standard uncertainty	Units	Uncertainty as percentage	Uncertainty at lv	Requirement of std
Sampled Volume Gas	V _m	1.1492	uV _m	0.001 m ³		0.09	<=2%
Sampled gas Temperature	T _m	298	uT _m	2 k		2.00	<2.5 k
Sampled gas Pressure	p _m	99.1	up _m	1.0 kPa		1.00	<=1%
Sampled gas Humidity	H _m	0	uH _m	1 % by volume		1.00	<=1%
Oxygen content	O _{2,m}		uO _{2,m}	0.1 % by volume	#DIV/0!		<=5%
Concentration in impinger 1	C	0.05	uC	0.002 mg/l		4.03	<=5%
Impinger solution volume 1	VS	0.11	uVS	0.001 l		0.94	<2%
Concentration in impinger 2	C	0.32	uC	0.013 mg/l		4.03	<=5%
Impinger solution volume 2	VS	0.11	uVS	0.001 l		0.91	<2%
Concentration in impinger 3	C	0.05	uC	0.002 mg/l		4.03	<=5%
Impinger solution volume 3	VS	0.106	uVS	0.001 l		0.94	<2%
Mass HCl	m	0.0458	um	0.00 mg		5.44	#DIV/0! <10% of limit value
Note - Sampled gas humidity, temperature and pressure are values at the gas meter							
Leak	L	2		%		2.00	<=2%
Analytical Uncertainty (V)	Ua	4.03 %					

Intermediate calculations				
Factor for std conds uncertainty components	symbol	sensitivity coeff	u (in units of fs)	
	p _m	0.009	0.009	
	H _m	0.009	0.009	
	T _m	0.003	0.006	
	ufs		0.014	1.56
Corrected volume	V	1.03	uV	0.016 m ³
$V = V_m f_s$				
Factor for O2 correction uncertainty components	symbol	sensitivity coeff	u	
	O _{2,m}	0.05	0.005	
$f_c = \frac{21 - O_{2,ref}}{21 - O_{2,m}}$				
Factor for O2 Correction	ufc	1.00	0.005	0.48

Parameter	Value	Units	Sensitivity coeff	Uncertainty contribution	Uncertainty as %
Corrected Volume (standard conditio	V	1.030 m ³	0.04	0.00 mg.m ⁻³	1.57 %
Mass	m	0.05 mg	0.97	0.00 mg.m ⁻³	5.44 %
Factor for O2 Correction	fc	1.00	0.04	0.00 mg.m ⁻³	0.48 %
Leak	L	0.00 mg.m ⁻³	1.00	0.00 mg.m ⁻³	1.15 %
Combined uncertainty				0.00 mg.m⁻³	

Expanded uncertainty as percentage of measured value	11.60	% measured of value	expressed with a level of confidence of 95% (Using a coverage factor k=2)
Expanded uncertainty in units of measurement	0.01	mg.m ⁻³	
Expanded uncertainty as percentage of limit value	#DIV/0!	% ELV	

Verified

Uncertainty calculation for Ammonia

Uncertainty calculation for BS-EN-ISO-21877:2019 - Stationary source emissions. Determination of the mass concentration of ammonia. Manual method

Measurement Equation

$$c = \frac{m}{V} f_c$$

Limit value (ELV)		mg.m ⁻³	Reference oxygen		% by volume
Measured concentration	0.5	mg.m ⁻³ (at reference conditions)			

Measured Quantities	Symbol	Value	Standard uncertainty	Units	Uncertainty as percentage	Uncertainty at lv	Requirement of std
Sampled Volume Gas	V _m	1.1492	uV _m	0.001 m ³	0.09		<=2%
Sampled gas Temperature	T _m	294.75	uT _m	2 k	2.00		<2.5 k
Sampled gas Pressure	p _m	99.1	up _m	1.0 kPa	1.00		<=1%
Sampled gas Humidity	H _m	0	uH _m	1 % by volume	1.00		<=1%
Oxygen content	O _{2,m}		uO _{2,m}	0.1 % by volume	#DIV/0!		<=5%
Concentration in impinger 1	C	4.40	uC	0.200 mg/l	4.54		<=5%
Impinger solution volume 1	VS	0.12	uVS	0.001 l	0.83		<2%
Concentration in impinger 2	C	0.10	uC	0.005 mg/l	4.54		<=5%
Impinger solution volume 2	VS	0.11	uVS	0.001 l	0.90		<2%
Concentration in impinger 3	C	0.1	uC	0.005 mg/l	4.54		<=5%
Impinger solution volume 3	VS	0.11	uVS	0.001 l	0.91		<2%
Mass NH3	m	0.5545	um	0.03 mg	6.09	#DIV/0!	<10% of limit value
Note - Sampled gas humidity, temperature and pressure are values at the gas meter							
Leak	L	2		%	2.00		<=2%
Analytical Uncertainty (V)	Ua	4.54 %					

Intermediate calculations				
Factor for std cond	symbol	sensitivity coeff	u (in units of fs)	
Factor for std cond	fs	0.91		
uncertainty components				
	p _m	0.009	0.009	
	H _m	0.009	0.009	
	T _m	0.003	0.006	
	ufs		0.014	1.57
Corrected volume	V	1.04	uV	0.016 m ³
				$V = V_m f_s$
Factor for O2 correction	fc	1.00		
uncertainty components				
	O _{2,m}	0.05	0.005	
				$f_c = \frac{21 - O_{2,ref}}{21 - O_{2,m}}$
Factor for O2 Correction	ufc	1.00	0.005	0.48

Parameter	Value	Units	Sensitivity coeff	Uncertainty contribution	Uncertainty as %
Corrected Volume (standard conditio	V	1.041 m ³	0.51	0.01 mg.m ⁻³	1.57 %
Mass	m	0.55 mg	0.96	0.03 mg.m ⁻³	6.09 %
Factor for O2 Correction	fc	1.00	0.53	0.00 mg.m ⁻³	0.48 %
Leak	L	0.01 mg.m ⁻³	1.00	0.01 mg.m ⁻³	1.15 %
Combined uncertainty				0.03 mg.m⁻³	

Expanded uncertainty as percentage of measured value	12.82	% measured of value	expressed with a level of confidence of 95% (Using a coverage factor k=2)
Expanded uncertainty in units of measurement	0.07	mg.m ⁻³	
Expanded uncertainty as percentage of limit value	#DIV/0!	% ELV	

Verified

Uncertainty calculation for BS EN 14385 Determination of mass concentration of metal, Reference method

Measurement Equation

$$c = \frac{m}{V} f_c$$

Limit value (ELV)		mg.m ⁻³	Reference oxygen		% by volume
Measured concentration	0.0028	mg.m ⁻³ (at reference conditions)			

Measured Quantities	Symbol	Value	Standard uncertainty	Units	Uncertainty as percentage	Uncertainty at lv	Requirement of std
Sampled Volume Gas	V _m	1.1629	uV _m	0.001 m ³	0.09		<=2%
Sampled gas Temperature	T _m	285.38	uT _m	2 k	2.00		<2.5 k
Sampled gas Pressure	p _m	99.1	up _m	1.0 kPa	1.00		<=1%
Sampled gas Humidity	H _m	0	uH _m	1 % by volume	1.00		<=1%
Oxygen content	O _{2,m}		uO _{2,m}	0.1 % by volume	#DIV/0!		<=5%
Concentration in impinger 1+2	C	7.000	uC	0.196 µg/l	2.81		<=15%
Impinger solution volume 1+2	VS	0.211	uVS	0.001 l	0.47		<2%
Concentration in impinger 3	C	0.300	uC	0.008 µg/l	2.81		<=15%
Impinger solution volume 3	VS	0.119	uVS	0.001 l	0.84		<2%
Concentration Filter	C	1.500	uC	0.110 µg	7.35		<=15%
Mass Metal	m	3.0127	um	0.192 mg	6.39	#DIV/0!	<10% of limit value
Note - Sampled gas humidity, temperature and pressure are values at the gas meter							
Leak	L	2 %			2.00		<=2%
Analytical Uncertainty (P)	Ua	7.35 %					
Analytical Uncertainty (V)	Ua	2.81 %					

Intermediate calculations							
Factor for std conds	fs	0.94					
uncertainty components	symbol	sensitivity coeff		u (in units of fs)			
	p _m	0.009		0.009			
	H _m	0.009		0.009			
	T _m	0.003		0.007			
	ufs			0.015			1.58
Corrected volume	V	1.09	uV	0.017 m ³	$V = V_m f_s$		1.58
Factor for O2 correction	fc	1.00					
uncertainty components	symbol	sensitivity coeff		u			
	O _{2,m}	0.05		0.005	$f_c = \frac{21 - O_{2,ref}}{21 - O_{2,m}}$		
Factor for O2 Correction	ufc	1.00		0.005			0.48

Parameter	Value	Units	Sensitivity coeff	Uncertainty contribution	Uncertainty as %
Corrected Volume (standard conditio	V	1.088 m ³	0.00	0.00004 mg.m ⁻³	1.58 %
Mass	m	0.003013 mg	0.92	0.00018 mg.m ⁻³	6.39 %
Factor for O2 Correction	fc	1.00	0.00	0.00001 mg.m ⁻³	0.48 %
Leak	L	0.00 mg.m ⁻³	1.00	0.00003 mg.m ⁻³	1.15 %
Combined uncertainty				0.00 mg.m⁻³	

Expanded uncertainty as percentage of measured value	13.39	% measured of value	expressed with a level of confidence of 95% (Using a coverage factor k=2)
Expanded uncertainty in units of measurement	0.0004	mg.m ⁻³	
Expanded uncertainty as percentage of limit value	#DIV/0!	% ELV	

Verified