

Report for the Periodic Monitoring of Emissions to Atmosphere

British Crystal Ltd

EP2 - Acid Polishing Plant Exhaust

Permit No: PB/98
Installation: Brierley Hill Crystal
Monitoring Dates: 16th December 2020
Site Address: Brierley Hill Crystal, Unit 14 Pedmore Road Industrial Estate, Pedmore Rd, Brierley Hill, DY5 1TJ

Report Number: ES-0309 Version: 1 Visit: 1 in 2020
Date of Report: 19th January 2021
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MCERTS No: MM 18 1478 MCERTS Level: 2 (TE1, TE3, TE4)

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Executive Summary

Monitoring Objectives

Envirocare Technical Consultancy were contracted by British Crystal Ltd to carry out emissions monitoring, to determine the compliance of EP2 - Acid Polishing Plant Exhaust with the conditions specified in the operators permit (PB/98) for emissions to atmosphere. The methodologies utilised and the results obtained form the basis of this report.

The substances requested for monitoring are listed below.

Emission Point Identification

Substances to be Monitored	EP2 - Acid Polishing Plant Exhaust
Fluoride (as HF)	✓

Special requirements: none.

Opinions and interpretations expressed within this report are outside the scope of Envirocare Technical Consultancy's MCERTS and UKAS accreditation. Envirocare accepts no responsibility for information in this report that was provided by the client, the client's representative or employees of the client. Where such information has been provided by external sources this is identified in footnotes of the respective tables.

Executive Summary

Monitoring Results

EP2 - Acid Polishing Plant Exhaust

Substance	Emission Limit Value (mg/m ³)	Periodic Monitoring Result (mg/m ³)	Uncertainty as a % of Measured Concentration (95% confidence)	Reference Conditions	Date	Start and End Times	Monitoring Reference Method	Accreditation for Use of Method
Fluoride (as HF)	5	0.78	5.5	273K, 101.3kPa, DRY	15/12/2020	12:30-13:30	BS ISO 15713	MCERTS

Operating Information

EP2 - Acid Polishing Plant Exhaust

Date	Process Type	Fuel	Feedstock	Abatement	Load	Operating Status
16/12/2020	Continuous - Acid Polishing Process	None	Glass & Acids	None	Normal usage	Normal Operation

*information provided by Site

Monitoring Deviations

EP2 - Acid Polishing Plant Exhaust

Substance Deviations	Monitoring Deviations	Other Relevant Issues
None	None	None

Supporting Information

Appendix 1: General Information

Monitoring Organisation Staff Details

Personnel	Position	MCERTS Level	MCERTS Number
Mr B Grant	Team Leader	2 (TE1, TE2, TE3, TE4)	MM 03 200
Mr T Arden	Team Leader	2 (TE1, TE3, TE4)	MM 18 1478
Mr R Bromwell	Technician	Level 1	MM 20 1592

Monitoring Methods

Pollutant Species	Standard	Technique	ISO 17025 Analysis	Analysis Lab	Envirocare Internal Procedure
Fluoride (as HF)	BS ISO 15713	IC	Yes	RPS	ETC - SE - 20

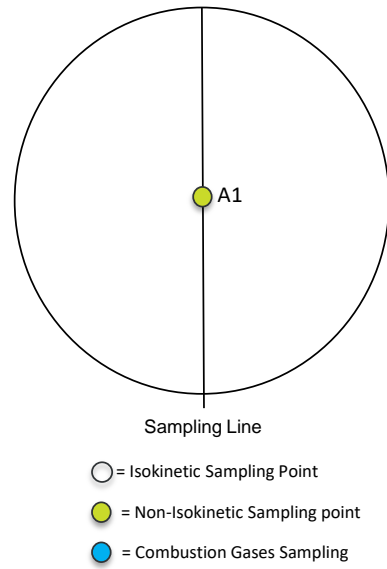
Analysis Laboratories Accreditation Details	
Envirocare (ENV)	ISO 17025 Accreditation Number: 2522
RPS Laboratories Ltd (RPS)	ISO 17025 Accreditation Number: 0605

Equipment Checklist

Equipment ID	Model Number	Purpose
ETC-S08.03	Millenium Console	Isokinetic Sampler
ES-09.03	Oven Box	Sample Filter Heater
ETC-S04.01	Integrated Method 5 Sampling Probe	Integrated Probe
10-17-19-1	S-Type Pitot	Duct Flow Measurement
L-Type 3	L-Type Pitot	Duct Flow Measurement
BA7	Site Balance	Moisture Measurement
VC11	Vernier Caliper	Nozzle measurement
TM69	5M Tape Measure	Duct dimension measurement
SW3	Stopwatch	Sample duration measurement
ES-11.03 (BA13)	Barometer	Ambient pressure measurement
ETC-S24.03a/b	KIMO Micromanometer / Temperature Meter	Differential pressure and temperature measurement

Appendix 2: EP2 - Acid Polishing Plant Exhaust Results and Calculations

Picture of the sampling location and positions



Fluoride (as HF) - Run 1 Calculations

Sampling Details		
Meter Box Number	ES-8.03	-
Gas Meter Coefficient	1.050	-
Pitot Coefficient	0.862	-
Stack Gas Molecular Weight	29.0	g/mole
Static Pressure in Stack	<0.05	cmH ₂ O

Analysis Details		
Collection Media	0.1N NaOH	
1st Collector Reference	ES - 0309 / 08 EP2 HF AB R1	
1st Collector Concentration	472.34	µg
2nd Collector Reference	ES - 0309 / 09 EP2 HF C R1	
2nd Collector Concentration	<12.75	µg
Blank Concentration	<0.02	mg/Nm ³
Has breakthrough occurred?	No	-

Isokineticity Details		
Nozzle Diameter	-	mm
Average Gas Meter Temperature	19.8	°C
Average Stack Temperature	15.0	°C
Average Stack Velocity	-	m/s
Isokineticity	-	%

Date	Operators
15/12/2020	TA/RB/BG

Parameter	Before	After	Unit
Barometric Pressure	1002	1002	mbar
Ambient Temperature	16.0	15.0	°C
Leak Check	0.06	0.05	L/min
Time	12:30	13:30	-

Emissions Calculations		
Total Sampling Time	60.0	min
Gas Meter Difference	626.0	L
Corrected Gas Meter Volume	657.0	L
Mean Sampling Rate	10.95	L/min
STP Dry Gas Meter Volume	606.0	NL
Mass of Water Vapour Collected	15.0	g
Volume of Water Vapour Collected	18.7	NL
Stack Gas Water Vapour Content	3.0	% v/v
Emission Limit Value	5.0	mg/Nm ³
Corrected HF Emission	0.78	mg/Nm³
Corrected to 11% Oxygen	N/A	mg/Nm ³
Mass Emission Rate	0.006	kg/hr

Uncertainty

Uncertainty of Fluoride (as HF) - Run 1

Parameter	Value	Unit
Emission Limit Value (ELV)	5	mg/m ³
Mean Sampling Rate	10.9	L/min
Leak Rate	0.06	L/min
Barometric Pressure	1002	mbar
Average Stack Temperature	15.0	°C
Sampled Stack Gas Volume	626	L

Parameter	Value	Unit
Mean Emission Concentration	0.80	mg/m ³
Monitoring Duration	60	min
Console ID	ES-8.03	-
Temperature Uncertainty	0.24	°C
Gas Meter Uncertainty	0.37	%
Barometer Uncertainty	1.0	mbar

Source of Uncertainty	ASD*	BS ISO 15713		Envirocare Certified Value	Units	% Actual Value	Source Uncertainty u	Combined Uncertainty u ²
		Uncertainty Criteria	Max. Value					
Analysis Procedure	Std	-	-	17.4	%	8.9	0.14	0.02
Leak Rate	Rect	<2% of sampling rate	0.22	0.06	L/min	0.50	0.002	0.000005
Time	Std	1sec in 1hour = 0.028%	2.0	1.0	sec	0.03	0.0002	0.0000005
Gasmeter Volume	Std	<2% actual volume	12.5	2.3	L	0.37	0.003	0.000009
Temperature	Std	<1% absolute temperature	2.9	0.24	°C	0.08	0.0007	0.0000004
Pressure	Std	<1% absolute pressure	10.0	1.0	mbar	0.10	0.0008	0.0000006
Total								0.02
Combined Standard Uncertainty [(sum u²)^{0.5}]								0.14
Expanded Total Uncertainty as a % of emission conc. (95% confidence)								34.1
Expanded Total Uncertainty (mg/m³) (95% confidence)								0.27
Expanded Total Uncertainty as a % of emission limit value (95% confidence)								5.5