

Permit Reference Number: BU21101S

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: A2 / Form Dated 1st February 2006

Reporting of Emissions to Air for the period from 1st January 2019 to 31st December 2019

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
A1	Oxides of nitrogen as NO ₂	50mg/m ³ ^[6]	3.2	TGN M22	06-11-19 1000-1100, 1200-1300, 1300-1400hrs	MCERTS / UKAS	±0.4 mg/m ³
A2	Oxides of nitrogen as NO ₂	200mg/m ³ ^[7]	110.2	BS EN 14792	08-11-19 0830-0930hrs	MCERTS / UKAS	± 5.5 mg/m ³
A2	Carbon monoxide	200mg/m ³ ^[7]	22.0	BS EN 15058	08-11-19 0830-0930hrs	MCERTS / UKAS	± 1.5 mg/m ³
A3	Oxides of nitrogen as NO ₂	None	1.5 (B)	BS EN 14792	07-11-19 1440-1540hrs	MCERTS / UKAS	± 0.12 mg/m ³
A3	Carbon monoxide	None	2.1 (b)	BS EN 15058	07-11-19 1440-1540hrs	MCERTS / UKAS	± 0.17 mg/m ³
A13 & A24	Formaldehyde	100g/hr ^[6] ^[8]	2.5	BS EN 13649	06-06-19 0950-1050, 1958-1158, 1208-1308hrs, 08-11-19 0953-1053, 1057-1157, 1201-1301hrs, 08-11-19 0852-0952, 0957-1057, 1103-1203hrs	MCERTS / UKAS	± 0.27 g/hr

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Note: Result [1] are average values of sample results (where indicated), being more representative, as agreed with NRW

[1b] Results of site's only operational boiler B. (During the sampling period the boiler was only operating for 2 min as it is now typically only on stand-by, but testing was referenced to 3% Oxygen as stated in the Permit).

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given.

[3] For non-continuous measurements the date and time of the sample that produced the result is given.

[4] The accreditation status of the equipment and/or the monitoring organisation, as appropriate, for the methods used for both sampling and analysis.

[5] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated. The basis of any other uncertainty figure needs to be stated. Where no figure is available NRW will need to agree an appropriate uncertainty value.

[6] Corrected to 273K, 101.3KPa.

[7] Corrected to 273K, 101.3KPa, 3% oxygen, dry.

[8] Combined mass emission from A13 and A24 emission point corrected 273K, 101.3KPa.

Signed

(authorised to sign as representative of Operator)

Date: 30th January 2020

Permit Reference Number: BU2110IS

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: R1 / Form Dated 1st February 2006

Reporting of Waste Disposal and Recovery for the year 2019 (01/01/19 – 31/12/19)

Waste Description	Disposal Route	Recovery	
		Tonnes	Tonnes
1) Hazardous Wastes			
Hazardous waste from production and maintenance activities	D09, D15, R03, R09, R13	40.1	5.3
Other hazardous wastes	N/A	N/A	
Total hazardous waste		45.4	
2) Non-Hazardous Wastes			
Non-Hazardous silica waste to landfill from production activities (including packaging)			
Non-Hazardous waste from production and maintenance activities	D01	110.9	
Non-Hazardous waste from construction activities (subsoil and hardcore)	D01, D15, R01, R03, R04, R12, R13	4.1	237.3
Total Non-Hazardous waste		115.0	240.5
TOTAL WASTE		155.1	245.8

Trends in Waste Disposal and Recovery				
Year	Parameter	Total Waste	Waste per unit output	Report on P11
2010	199.5	199.5	Report on P11	
2011	245.4	245.4	Report on P11	
2012	165.65	165.65	Report on P11	
2013	214.31	214.31	Report on P11	
2014	242.50	242.50	Report on P11	
2015	258.72	258.72	Report on P11	
2016	430.6	430.6	Report on P11	
2017	146.5	146.5	Report on P11	
2018	174.9	174.9	Report on P11	
2019	155.1	155.1	Report on P11	

Operator comments: ~30MT less sent to Landfill

Signed

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Date 30th January 2020

Permit Reference Number: BU21101S

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: WU1 / Form Dated 1st February 2006

Reporting of Water Usage for the year 2019 (01/01/19 – 31/12/19)

Water Source	Usage (m ³)	Specific Usage (m ³ /t)
Mains water	69,980	6.44
Dow Corning	53,899	4.96
TOTAL WATER USAGE	123,879	11.40

Year	Trends in Water Usage			Water per unit output
	Mains water	Dow Corning	Total water usage	
2006	103,892	94,047	197,939	Report on P11
2007	92,671	87,424	180,096	Report on P11
2008	49,805	73,734	123,539	Report on P11
2009	52,229	47,656	99,885	Report on P11
2010	58,643	43,664	102,307	Report on P11
2011	73,172	44,154	117,326	Report on P11
2012	76,828	42,204	119,032	Report on P11
2013	76,004	49,040	125,044	Report on P11
2014	68,392	41,828	110,220	Report on P11
2015	74,320	38,023	112,343	Report on P11
2016	78,272	32,911	111,182	Report on P11
2017	76,512	38,898	115,410	Report on P11
2018	69,695	50,490	120,185	Report on P11
2019	69,980	53,899	123,879	Report on P11

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Date 30th January 2020

Permit Reference Number: BU21101S

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: E1 / Form Dated 1st February 2006

Reporting of Energy Usage for the year 2019 (01/01/19 – 31/12/19)

Energy Source	Energy Usage		CO ₂ Produced (Tonnes)
	Quantity	Primary Energy (MWh)	
Electricity	MWh	36,721	6,096
Natural Gas	MWh	39,345	7,472
TOTAL		76,066	13,567

* Conversion factor for delivered electricity to primary energy = 2.4

** Conversion factor for Electricity CO₂ equivalent metric tonnes = MWh x 0.166

*** Conversion factor for Gas CO₂ equivalent metric tonnes = MWh x 0.190

Year	Trends in Energy Usage		
	Primary Energy usage	CO ₂ produced	CO ₂ per unit output
2009	95,570	17,445	Report on PI1
2010	99,165	18,055	Report on PI1
2011	97,179	17,681	Report on PI1
2012	93,540	17,004	Report on PI1
2013	84,074	15,040	Report on PI1
2014	85,449	15,306	Report on PI1
2015	86,454	15,480	Report on PI1
2016	85,907	15,351	Report on PI1
2017	76,211	13,531	Report on PI1
2018	83,219	14,865	Report on PI1
2019	76,066	13,567	Report on PI1

Operator comments:

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Date 30th January 2020

Permit Reference Number: BU21101S

Operator: Cabot Carbon Limited

Installation: Barry Silicon-Based Manufacturing Installation

Form Number: PI1 / Form Dated 1st February 2006

Reporting of Performance Indicators for the year 2019 (01/01/19– 31/12/19)

Annual Production/Treatment	
Production of fumed silica	10863 tonnes

Environmental Performance Indicators

Parameter	Annual Average	Units
Carbon monoxide	24.5	kg/tonne
Water use	11.4	m ³ /tonne
Energy use	7,002	kWh/tonne
Carbon dioxide	0.69	tonne/tonne
Waste silica to landfill	10.6	kg/tonne
Chlorosilane	2.82	tonne/tonne
Hydrogen	583.14	Nm ³ /tonne

Trends in Environmental Performance							
Year	Parameter						
	CO	Water	Energy	CO ₂	Waste silica	Chloro-silane	H ₂
	kg/t	m ³ /t	kWh/t	t/t	kg/t	t/t	Nm ³ /t
2008	29.05	13.2	10,670	1.3855	8.30	2.73	694.81
2009	30.61	11.3	10,817	1.3790	4.87	2.60	766.64
2010	40.41	10.2	9,900	1.2640	7.56	2.59	604.20
2012	37.28	13.2	10,356	1.2990	8.63	2.83	628.90
2013	21.31	10.80	7,262	0.7401	11.89	2.41	575.30
2014	21.69	9.04	7,011	0.7282	17.06	2.51	503.51
2015	20.63	8.98	6,910	0.7143	14.13	2.53	579.39
2016	22.90	9.41	7,273	0.7309	27.5	2.50	583.30
2017	21.30	9.58	6,324	0.5782	9.6	2.50	557.63
2018	27.29	9.62	6,663	0.6926	11.3	2.50	585.94
2019	24.5	11.4	7,002	0.6878	10.6	2.82	583.14

Operator's comments. Lower production volumes reflecting market conditions. Production units occasionally on heat load and not producing hence increase in some PIs. Off Quality product continues to decrease for the site through improvement of the process and quality systems.

[Signature]

Signed

(authorised to sign as representative of the Operator)

Date: 30th January 2020