

Appendix F

Hexavalent Chromium Emission Calculations

Owens Corning Guelph Glass Plant
Data for the Current Hexavalent Chromium Emissions

Hexavalent Chromium Emission Rates - Process Stacks

Source ID	Source Description	Measured Emission Rate (ug/s)	Conversion Factor	Emission Rate (g/s)	Reference
B01	107 Furnace Stack (West)	36	0.000001	3.60E-05	Validated Source Testing June 2014 - project 144539B
B11	107B Forehearth Stack	151	0.000001	1.51E-04	Validated Source Testing June 2014 - project 144539B
B38	105 Forehearth Stack	33.2	0.000001	3.32E-05	Validated Source Testing September 2014 (Re-test project 144539B)

Hexavalent Chromium Emission Rates - General Ventilation Exhausts

Source ID	Source Description	Blank Corrected Emission Rate (g/s)	Reference
B08	Furnace Hall Roof Exhaust #2	2.05E-06	Source Testing (Post Validated) May 2014 - project 144539A
B10	Furnace Hall Roof Exhaust #3	2.39E-06	Source Testing (Post Validated) May 2014 - project 144539A
C80	Room Ventilation CFM Forehearth	2.04E-06	Source Testing (Post Validated) May 2014 - project 144539A
B32	Furnace Hall Roof Exhaust #2	2.39E-06	Source services same general area as B10 (Furnace Hall Exhaust #3). Emissions estimated to be identical.
B34	Furnace Hall Roof Exhaust #1	2.39E-06	Source services same general area as B10 (Furnace Hall Exhaust #3). Emissions estimated to be identical.
B35	Furnace Hall Roof Exhaust #3	2.39E-06	Source services same general area as B10 (Furnace Hall Exhaust #3). Emissions estimated to be identical.
C79	Room Ventilation CFM Forehearth	2.04E-06	Source services same general area as C80 (CFM forehearth). Emissions estimated to be identical.

LEHDER Environmental Services Ltd.

Company: Owens Corning
Plant: Guelph
Stack: B38 - East Forehearth

Pollutant: Hexavalent Chromium
Method: EPA Method 0061
Project No.: 144539B

Reviewed by GB

Measurement Parameter		Test #1 15-Sep-14 14:07 - 15:53	Test #2 16-Sep-14 8:03 - 9:27	Test #3 16-Sep-14 9:51 - 11:14	Average
Hexavalent Chromium Concentration	µg/R.m ³	18.9	16.0	21.8	18.9
Hexavalent Chromium Mass Rate	µg/s	35.4	28.4	35.7	33.2
	mg/s	0.035	0.028	0.036	0.033
	g/hr	0.13	0.10	0.13	0.12
	lb/hr	2.81E-04	2.26E-04	2.83E-04	2.63E-04

LEHDER Environmental Services Ltd.

Company: Owens Corning
Plant: Guelph
Stack: B11 - West Forehearth

Pollutant: Hexavalent Chromium
Method: EPA Method 0061
Project No.: 144539B

Reviewed by GB

Measurement Parameter		Test #1 12-Jun-14 08:39 - 10:03	Test #2 12-Jun-14 10:53 - 12:21	Test #3 12-Jun-14 13:23 - 14:48	Average
Hexavalent Chromium Concentration					
	µg/R.m ³	110	88	90	96
Hexavalent Chromium Mass Rate	µg/s	175	139	138	151
	mg/s	0.18	0.14	0.14	0.15
	g/hr	0.63	0.50	0.50	0.54
	lb/hr	1.39E-03	1.10E-03	1.09E-03	1.20E-03

LEHDER Environmental Services Ltd.

Company: Owens Corning
Plant: Guelph
Stack: B1 - West Furnace

Pollutant: Hexavalent Chromium
Method: EPA Method 0061
Project No.: 144539B

Comments: Spreadsheet modified to use averages of temp. & velocity measurements before and after each test

Reviewed by GB

Measurement Parameter		Test #1 12-Jun-14 08:35 - 09:55	Test #2 12-Jun-14 12:46 - 14:06	Test #3 12-Jun-14 14:47 - 16:07	Average
Hexavalent Chromium Concentration	$\mu\text{g}/\text{R.m}^3$	18	23	9	17
Hexavalent Chromium Mass Rate	$\mu\text{g}/\text{s}$	38	50	19	36
	mg/s	0.038	0.050	0.019	0.036
	g/hr	0.14	0.18	0.070	0.13
	lb/hr	2.98E-04	3.94E-04	1.53E-04	2.82E-04

LEHDER Environmental Services Limited
Hexavalent Chromium Concentration Calculations

Company: **Owens Corning**
Location: **Guelph Glass**
Source: **Selected Roof Ventilation Fans**
Project: **144539A**

Source	Test #	Date 2014	Time Hr	Test Duration min.	DGM Y	Initial DGM Volume ft ³	Final DGM Volume ft ³	Sample Volume ft ³	Sample Rate cfm	DGM Temp. °F	Barometric Pressure in Hg	Meter Pressure in H ₂ O	ABS. Meter Pressure in Hg
Source B8	1	7-May	8:17 - 15:47	450	1.026	609.662	970.714	370	0.823	105	29.04	2.0	29.19
Source B10	1A	7-May	8:40 - 16:10	450	1.021	876.500	1232.87	364	0.808	85	29.04	2.0	29.19
Source B10	1B	7-May	8:42 - 16:12	450	0.9888	580.545	967.662	383	0.851	85	29.04	2.0	29.19
Source B10	Avg							373	0.829				
Source C80	1	7-May	8:56 - 16:33	457	0.9985	655.995	1028.40	372	0.814	62	29.04	2.0	29.19

Source	Test #	Date 2014	Time Hr	Moisture Catch g	Moisture Content (%)	Corrected Sample Volume S.ft ³	Dry Ref. Sample Volume S.ft ³ (dry)	Hex Chrome Analysis µg	Reagent Blank µg	Gas Sample Volume m ³	Raw Cr ⁺⁶ Concentration µg/m ³	Blank Corrected Cr ⁺⁶ Concentration µg/m ³
Source B8	1	7-May	8:17 - 15:47	18.3	0.26	343	343	2.7	1.0	9.71	0.28	0.18
Source B10	1A	7-May	8:40 - 16:10	37.2	0.51	349	348	4.3		9.85	0.44	0.33
Source B10	1B	7-May	8:42 - 16:12	32.6	0.42	368	367	2.9		10.4	0.28	0.18
Source B10	Avg				0.47	359	357	3.6		10.1	0.36	0.26
Source C80	1	7-May	8:56 - 16:33	37.7	0.48	373	372	2.5		10.5	0.24	0.14

Source	Test #	Date 2014	Time Hr	Fan Flow Rate			Raw Cr ⁺⁶ Emission Rate g/s	Blank Corrected Cr ⁺⁶ Emission Rate g/s
				Data*		m ³ /s (dry)		
cfm (wet)	Temp (oF)							
Source B8	1	7-May	8:17 - 15:47	2.69E+04	120	11.7	3.26E-06	2.05E-06
Source B10	1A	7-May	8:40 - 16:10	2.12E+04		9.23	4.03E-06	3.09E-06
Source B10	1B	7-May	8:42 - 16:12	2.12E+04	120	9.23	2.58E-06	1.69E-06
Source B10	Avg			2.12E+04		9.23	3.30E-06	2.39E-06
Source C80	1	7-May	8:56 - 16:33	3.18E+04	100	14.3	3.40E-06	2.04E-06

* Fan Data from OC Personnel / Air Audit, Inc. Report

B8 Fan low speed 2.12E+04 cfm @ 120 °F

B8 Fan middle speed 3.12E+04 cfm @ 120 °F

B8 fan ran at low speed for 193 min and middle speed for 257 min during testing. Total test time was 450 min

Time Weighting Factors: 193 min / 450 min = 0.43 at low speed; 257 min / 450 min = 0.57 at mid-speed

Time Weighted Average Speed = 0.43 x 2.1E+04 scfm + 0.57 x 3.12E+04 scfm

B8 TWA = 2.69E+04 scfm

Revised by: G. Bastien

