Exova
2395 Speakman Dr.
Mississauga
Ontario
Canada
L5K 1B3

T: +1 (905) 822-4111
F: +1 (905) 823-1446
E: sales@exova.com
W: www.exova.com

Testing. calibrating. advising

Bombardier SMP 800-C Toxic Gas Generation of "RADICI RADIFLAM AF9117GY"

A Report To:	**Klemsan Electric Electronic Industry and Trade Inc.** Kizilüzüm Mah. Kemalpaşa Kizilüzüm Caddesi No:15 3570 - Kemalpaşa/ Izmir Turkey
Phone:	+90 (232) 877 08 00
Attention:	Mustafa Kaya
E-mail:	mustafakaya@klemsan.com.tr
Submitted by:	Exova Fire Testing
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ACCREDITATION To ISO/IEC 17025 for a defined Scope of Testing by the International Accreditation Service

SPECIFICATIONS OF ORDER

Determine toxic gas production according to Bombardier SMP 800-C, as per Exova Quotation No. 18-002-585,437RV2 dated January 3, 2019.

SAMPLE IDENTIFICATION

Plastic material, nominally 4 mm in thickness, described as, "Polyamide 66", and identified as: "RADICI RADIFLAM AF9117GY"

(Exova sample identification number 19-002-S0020-1)

TEST RESULTS

Bombardier SMP 800-C Rev. 6 (2009-08-31)

Toxic Gas Generation

	Flaming Mode	Non-Flaming Mode	Specified Maxima	Result
Carbon Monoxide (CO ppm)				
at 1.5 minutes:	<1	<1	-	-
at 4.0 minutes:	74	8	-	-
at maximum:	287	46	3500	Pass
Carbon Dioxide (CO_2 ppm)				
at 1.5 minutes:	<10	26	-	-
at 4.0 minutes:	1970	63	-	-
at maximum:	26368	564	90000	Pass

TEST RESULTS (continued)

Bombardier SMP 800-C Rev. 6 (2009-08-31)

Toxic Gas Generation

	Flaming Mode	Non-Flaming Mode	Specified Maxima	Result
Nitrogen Oxides (as NO_2 ppm)	23	3	100	Pass
Sulfur Dioxide (SO_2 ppm)	<1	<1	100	Pass
Hydrogen Chloride (HCl ppm)	2	4	500	Pass
Hydrogen Fluoride (HF ppm)	<2	<2	100	Pass
Hydrogen Bromide (HBr ppm)	<1	<1	100	Pass
Hydrogen Cyanide (HCN ppm)	92	4	100	Pass
Original Weight (g)	25.67	25.63	-	-
Final Weight (g)	0.5	15.43	-	-
Weight Loss (g)	25.17	10.2		
Weight Loss (%)	98.1	39.8	-	
Time to Ignition (s)	15	Did not ignite	-	
Burning Duration (s)	Not determinable	-	-	

CONCLUSIONS

The polyamide material identified in this report meets Bombardier requirements as they pertain to toxic gas production (Bombardier SMP 800-C).

Mel Garces,
Senior Technologist.

Ian Smith,
Technical Manager.

Note: This report and service are covered under Exova Canada Inc. Standard Terms and Conditions of Contract which may be found on the Exova website (www.exova.com), or by calling 1-866-263-9268.

APPENDIX

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Summary of Test Procedure

Bombardier SMP 800-C Rev. 6 (2009-08-31)

Toxic Gas Sampling and Analytical Procedures

Toxic Gas Generation

Gases produced for analysis are generated in a specified, calibrated smoke chamber during standard rate of smoke generation testing (typically ASTM E 662), in both flaming combustion and non-flaming pyrolytic decomposition test modes.

Carbon Monoxide (CO) and Carbon Dioxide (CO_2)

CO and CO_2 are monitored continuously during the 20 minute test using a non-dispersive infrared (NDIR) analyzer. Data are reported in ppm by volume at 1.5 and 4.0 minutes and at maximum concentration.

Acid Gas Sampling

HCN, HF, HCl, HBr, NOX and SO2 are sampled by drawing 6 litres of the chamber atmosphere through two midget impingers, each containing 10 ml of 0.25N NaOH, at a rate of 375 ml per minute. The 16 minute sampling period is commenced at the 4 minute mark. All determinations are performed in both the flaming and non-flaming modes and all data are reported in parts per million (ppm) by volume in air.

Analysis of Impingers for Hydrogen Cyanide (HCN)

Cyanide in the NaOH impinger, as NaCN, is converted to CNCl by reaction with chloramine-T at pH greater than 8 without hydrolyzing to CNO^-. Afterthe reaction is complete, CNCl forms a red-blue colour on addition of a pyridine-barbituric acid reagent. Cyanide is quantified by spectrometric measurement of the increase in colour 578 nm. Reference: In-house SOP 00-13-SP-1216 based on ASTM Method D 2036-91

Analysis of Impingers for Hydrogen Fluoride (HF)

Fluoride, as NaF, in the NaOH impinger is determined using SPADNS colorimetry.

Reference: In-house SOP 01-13-SP-1295

Analysis of Impingers for Hydrogen Chloride (HCl) and Hydrogen Bromide (HBr)

Alkali halides (chloride and bromide) formed in the NaOH solution are measured using ion chromatography and conductivity detection. Reference: In-house SOP 02-13-SP-1402

Analysis of Impingers for Nitrogen Oxides (NO_x)

Nitrite and nitrate formed in the alkaline solution are determined using ion chromatography and conductivity detection. The nitrite and nitrite results are combined and the total expressed as nitrogen dioxide (NO_2).

Reference: In-house SOP 02-13-SP-1402

Analysis of Impingers for Sulfur Dioxide (SO2)

SO_2 is trapped in the NaOH impinger as sulfite and sulfate (SO_3^{-2} and SO_4^{-2}). Hydrogen peroxide is added to convert SO_3^{-2} to SO_4^{-2}. Resulting sulfate is determined using ion chromatography and conductivity detection. Reference: In-house SOP 02-13-SP-1402