BSS 7238 TESTING
FOR
POLYONICS INC.
ON
YELLOW XF-647
VTEC #100-3919-1
TESTED: May 19, 2014

May 19, 2014

Client: Polyonics
28Industrial
Park Drive
Westmoreland, NH 03467-4740

Attention: Don Nieratko

I. INTRODUCTION:

The following Scope, Summary of Method, Test Specimens, and Specimen Conditioning sections are abridged from the Boeing Safety Support Standard BSS 7238 – Test Method for Smoke Generation by Materials on Combustion.

II. SCOPE:

The method of test covers a procedure for measuring the smoke generated by solid materials and assemblies in thickness up to and including one inch. The test is based on the attenuation of a light beam by smoke accumulating within a closed chamber. Both non-flaming and flaming exposures are conducted. Results are expressed in terms of specific optical density, which is derived from measuring optical density (absorbance).

The photometric scale used to measure smoke by this method is similar to the optical density scale for human vision.

The test is intended for use in research and development and not as a basis for ratings for regulatory purposes. At the present time, no means are provided for predicting the density of smoke, which may be generated by the materials exposed to heat and flame under other fire conditions.

III. SUMMARY OF METHOD:

This method employs an electrically-heated radiant energy source mounted within an insulated ceramic tube and positioned so as to produce an irradiance level of 2.2 BTU/sec. Ft^2 (2.5 w/cm^2) averaged over the central 1.5" diameter area of a vertically mounted specimen facing the radiant heater. The nominal 3" X 3" specimen is mounted within a holder, which exposes an area 2-9/16" X 2-9/16". The holder can accommodate specimens up to one inch thick. This exposure provides the non-flaming exposure of the test.

For the flaming condition, a six-tube burner is used to apply a row of air-propane flamelets across the lower edge of the exposed specimen area and into the specimen holder trough. The application of flame in addition to the specified irradiance level from the heating element constitutes the flaming combustion exposure.

The test specimens are exposed to the flaming conditions within a closed 18 cubic foot chamber. A photometric system with a 36" vertical light path measure the continuous decrease in light transmission as smoke accumulates.

IV. TEST SPECIMENS:

The test specimens measure 3" X 3" +/-.03" and can be up to 1" thickness, depending on the particular sample thickness. Materials in thicknesses over 1" in thickness are sliced to 1" and the original uncut surface is tested. Multi-layer materials thicker than 1" with surface facings of different materials are sliced to 1", and each original (uncut) surface tested separately, if both surface facings are exposed to the fire.

V. SPECIMEN CONDITIONING:

Specimens are conditioned at a temperature of 70° ± 5°F (21° ± 3°C) and relative humidity of 50 ± 5 percent for 24 hrs, minimum.

TEST DATA: LIGHT TRANSMITTANCE

TEST:	FLAMING		
Time (min.)	Test#1	Test#2	Test#3
0.0	1.0000	1.0000	1.0000
0.5	0.9869	0.9612	0.9523
1.0	0.9752	0.9271	0.9453
1.5	0.9676	0.9001	0.9329
2.0	0.9546	0.8666	0.9064
2.5	0.9357	0.8400	0.8864
3.0	0.9167	0.8197	0.8798
3.5	0.9029	0.7960	0.8672
4.0	0.8830	0.7728	0.8532
4.5	0.8637	0.7591	0.8405
5.0	0.8441	0.7462	0.8272
5.5	0.8266	0.7392	0.8202
6.0	0.8184	0.7325	0.8139
6.5	0.8051	0.7255	0.8050
7.0	0.7923	0.7256	0.8005
7.5	0.7858	0.7192	0.7936
8.0	0.7858	0.7227	0.7936
8.5	0.7790	0.7255	0.7875
9.0	0.7792	0.7255	0.7879
9.5	0.7790	0.7255	0.7875
10.0	0.7795	0.7255	0.7903
10.5	0.7858	0.7325	0.7936
11.0	0.7916	0.7391	0.7936
11.5	0.7989	0.7391	0.8005
12.0	0.7989	0.7461	0.8070
12.5	0.8051	0.7477	0.8070
13.0	0.8051	0.7521	0.8139
13.5	0.8119	0.7590	0.8139
14.0	0.8184	0.7590	0.8187
14.5	0.8180	0.7657	0.8202
15.0	0.8184	0.7730	0.8271
15.5	0.8184	0.7791	0.8271
16.0	0.8250	0.7860	0.8336
16.5	0.8308	0.7882	0.8405
17.0	0.8308	0.7916	0.8405
17.5	0.8390	0.7927	0.8454
18.0	0.8440	0.7997	0.8463
18.5	0.8508	0.8059	0.8532
19.0	0.8508	0.8059	0.8598
19.5	0.8569	0.8128	0.8598
20.0	0.8636	0.8128	0.8667

DATE: 05/19/2014
PROJECT #: 100-3919-1
SUPPLIED BY: Polyonics Inc.
CONDITIONING TEMP: 70 deg. F
RADIOMETER READING: 5.24 volts
FURNACE VOLTS: 110 volts
BURNER FUEL: 500 cc/min air; 50 cc/min. propane
SPECIAL PREPARATION: None.
DESCRIPTION OF MATERIAL: Yellow XF-647

	FLAMING		
SAMPLE #:	**1**	**2**	**3**
Type of Holder:	no trough	no trough	no trough
Thickness (in):	0.003	0.003	0.003
Weight (g):	1.1	1.2	1.2
T 100%:	1.000	1.000	1.000
Tmin:	0.779	0.719	0.787
Tmin (%):	77.90	71.92	78.75
Dm:	14.32	18.90	13.70
Ds (1.5 min.):	1.89	6.03	3.98
Ds (4.0 min.):	7.13	14.78	9.10
Color of smoke:	Gray	Gray	Gray

OBSERVATIONS: During the flaming mode the samples ignited immediately and burned for remainder approximately 20 Seconds.

SUMMARY OF RESULTS

Average Ds at 1.5 mins: 3.97
Average Ds at 4.0 mins: 10.34
Average Dm: 15.64