

TEST REPORT

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PTM&W Industries, Inc.
10640 South Painter Avenue
Santa Fe Springs, CA 90670

OCMTL NO.: 281387A
DATE OF REPORT: 9-26-2008
PURCHASE ORDER NO: 20864-A
PHONE: 562-946-4511
FAX: 562-941-4773

Attn: Bill Ryan

October 16, 2008 Revision A

Summary:

Samples of cured urethane panels were submitted for flame testing to both UL94 and FAR 25.863 specifications.

UL94 Testing -

Background:

PTM&W Industries, Inc. submitted 10 samples for the purpose of flammability testing per UL 94 Vertical Para. 9.0. The sample was identified as follows:

- 1) Cured Urethane Panels; P/N# PT8958

Reference Documents:

Flammability Test Procedure: UL 94 V-O, Fifth Edition October 29, 1996, Titled: "20mm Vertical Burn Test."

Test Performed By: Mike Nelson

Test Date: 09-26-08

Testing:

Ten specimens measuring 125mm X 13mm X 2.2mm were conditioned in 2 groups of five specimens. Prior to testing, five specimens were conditioned for 168 hours at a temperature of 70°C with a cool down period of 4 hours in a desiccator, and five specimens were conditioned for a minimum of 48 hours at 23°C with 50% relative humidity.

Each specimen was held by the top 6mm portion so that the bottom edge was 10mm from the top of the 100mm X 9.5mm burner. The gas-adjusting valve was set to provide a vertical flame of 20mm in height with methane gas. There was a 50mm X 50mm X 6mm layer of dry absorbent cotton 300 mm underneath the bottom edge of the specimen.

The flame was applied for 10 seconds then removed. When afterflaming stopped, the burner was placed under the specimen again at a distance of 10mm for an additional 10 seconds.

Test data includes the following;

- a) Afterflame time after first flame application, t_1 .
- b) Afterflame time after second flame application, t_2 .
- c) Afterglow time after second flame application, t_3 .
- d) Whether or not specimens burn up to the holding clamp.
- e) Whether or not specimens drip flaming particles that ignited the cotton indicator.

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Test Results:

Flammability Test Data Per UL 94 V-O
Condition for 168 hours at 70°C

Specimen	#1	#2	#3	#4	#5	Requirements
Flame temp degrees C.	921	928	903	917	909	
1 st Afterflame time (seconds) t ₁ .	0.7	0.8	2.1	1.4	1.2	10 seconds max after flame source removed
Afterflame plus afterglow time after 2 nd flame (seconds) t ₂ + t ₃ .	0.9	1.7	0.7	2.4	1.9	30 seconds max
Afterflame or afterglow to the holding clamp.	No	No	No	No	No	No
Cotton ignited by flaming drops	No	No	No	No	No	No
Total Flame time for 1 st and 2 nd flame (sec.)	13.8					50 seconds max

Flammability Test Data Per UL 94 V-O
Condition for 48 hours at 23°C with 50% Relative humidity.

Specimen	#1	#2	#3	#4	#5	Requirements
Flame temp degrees C.	906	919	898	876	912	
1 st Afterflame time (seconds) t ₁ .	1.9	2.4	1.6	2.9	3.3	10 seconds max after flame source removed
Afterflame plus afterglow time after 2 nd flame (seconds) t ₂ + t ₃ .	1.5	1.1	2.0	0.8	2.8	30 seconds max
Afterflame or afterglow to the holding clamp.	No	No	No	No	No	No
Cotton ignited by flaming drops	No	No	No	No	No	No
Total Flame time for 1 st and 2 nd flame (sec.)	20.3					50 seconds max

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Observations:

There were no flame drippings observed on any of the 10 specimens on either the 1st or 2nd flame application. Material melted or burned immediately when flame was applied, and extinguished in a short time period.

Conclusion:

The material tested did meet the requirements of UL 94 V-O, Fifth Edition, Para 8.5.

Calibration of Equipment Used:

Equipment:	Control Number:	Calibration Date:	Calibration Due:
Burn Chamber	2049	09-08-08	09-08-09
Gas Pressure Gauge	2049B	09-08-08	09-08-09
Digital Timer	2049E	09-08-08	09-08-09
Digital Temp Readout	2049A	09-08-08	09-08-09
Conditioning Chamber	1605	07-21-08	07-21-09
Conditioning Chamber	1094	10-23-07	10-23-08

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FAR 25.853 Testing -

Background:

PTM&W Industries, Inc. submitted 3 samples of Cured Urethane Panels for the purpose Flammability testing per FAA FAR Volume III, Part 25.853 (a), Appendix F, Part 1 (a) (1) (i). The samples were identified as follows:

- 1) P/N # PT8958

Reference Documents:

Flammability Test Procedure: FAR Volume III, Part 25.853 (a), Appendix F, Part 1 (a) (1) (i).
Purchase Order Number: 20864-A

Test Date: 10-7-08

Test Performed By: Mike Nelson

Test Procedure:

Prior to testing, each specimen was conditioned for 24 hours at a temperature of $21 \pm 2^\circ\text{C}$ and $50\% \pm 5\%$ relative humidity.

The specimens were each inserted in a fixture vertically that allowed the bottom edge to be 0.75 inch above the top of the burner. A burner with a tube of 0.375 inside diameter was used. The gas-adjusting valve was set to provide a vertical flame of 1.00 inch in height with methane gas. Minimum flame temperature must be 1550°F .

Flame was applied for 60 seconds then removed. Flame time, burn length and flaming time of drippings, if any, were recorded.

TEST RESULTS:

Flammability Test Data Per FAR Volume III, Part 25.853 (a), Appendix F, Part 1 (a) (1) (i).

	Sample #1	Sample #2	Sample #3	Average	Requirements
Flame Temp Degrees F.	1594	1587	1601	1594	1550°F minimum
Flaming Particles	None	None	None	None	
Flaming Drippings	None	None	None	None	Average Extinguish Time 3 Seconds Max
Burn Length Inches	4.360	3.919	3.892	4.057	Average Burn Length 6 Inches Max
Flame Extinguish Time Seconds	0.5	3.6	2.1	1.9	Average Extinguish Time 15 Seconds Max

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OBSERVATIONS:

There were no flaming drippings or particles. Specimens extinguished upon release of the 60 Second flame.

CONCLUSION:

The Samples tested met the requirements of FAR Volume III, Part 25.853 (a), Appendix F, Part 1 (a) (1) (i)

Calibration of Equipment Used:

EQUIPMENT:	CONTROL NUMBER:	CALIBRATION DATE:	CALIBRATION DUE:
Burn Chamber	02049	9-8-08	9-8-09
Gas Pressure Gauge	02049B	9-8-08	9-8-09
Digital Timer	02049E	9-8-08	9-8-09
Digital Temp Readout	02049A	9-8-08	9-8-08
Conditioning Chamber	01605	7-21-08	7-21-09
Conditioning Chamber	01094	10-23-07	10-23-08

Submitted by,



Bruce K. Sauer
Technical Director

The test results in this report relate only to the items tested.

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