NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594

September 21, 2015

MATERIALS LABORATORY FACTUAL REPORT Report No. 15-068

A. ACCIDENT INFORMATION

Place	:	Valhalla, New York
Date	:	February 3, 2015
Vehicle	:	Metro-North Train #4432
NTSB No.	:	DCA15MR006
Investigator	:	

B. COMPONENTS EXAMINED

Flammability testing on train car interior materials and third rail cover

1. Seat cover/upholstery
2. Seat backrest/headrest cushion material
3. Seat cushion material
4. Seat back and bottom shell
5. Toilet module exterior material (similar material collected)
6. Side door pocket panels, end wall or bulkhead panels, electric locker door panels
7. Window mask panel/cove panel
8. Ceiling panel
9. 3rd rail cover
10. Fluorescent light diffuser lenses
11. Cab front window/passenger area window (polycarbonate)
12. End cap/windscreen (fiber-reinforced plastic (FRP))

C. DETAILS OF THE EXAMINATION

The samples listed above were submitted to an independent testing laboratory to assess the flammability of the materials. When originally installed in the #4432 train car, the train car materials were required to meet the following flammability requirements:

Seat cover material

- *12 Second Vertical Flame Application* in accordance with FAR 25.853 (a) as per Part 25 Appendix F Part I (b) (4)

Foam cushion material (any type)

- ASTM D-3675: *Standard Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source*

Seat backs, wall, side and ceiling panels, toilet module walls, windows, fluorescent light diffuser lenses and exterior end caps

- ASTM E-162: *Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source*

The table below is a summary of the acceptance compliance. The original testing reports with all testing data are attached at the end of the report.

Sample	**12 s Vertical Flame**	**ASTM E162**	**ASTM D3765**
Seat cover/upholstery	Does not comply	Reported[1]	Not applicable
Seat backrest/headrest cushion material	Not applicable	Not applicable	Complies
Seat cushion material	Not applicable	Not applicable	Does not comply
Seat back and bottom shell	Not applicable	Does not comply	Not applicable
Toilet module exterior material (similar material collected)	Not applicable	Inconclusive[2]	Not applicable
Side door pocket panels, end wall, bulkhead panels, electric locker door panels	Not applicable	Complies	Not applicable
Window mask panel/cove panel	Not applicable	Complies	Not applicable
Ceiling panel	Not applicable	Complies	Not applicable
3rd rail cover	Not applicable	Reported[3]	Not applicable
Fluorescent Light diffuser lenses	Not applicable	Complies	Not applicable

[1] ASTM E162 was not a required test for seat covering. The test was performed for investigative purposes.
[2] There was insufficient sample material to do all four tests required as per the standard. However, the three tests that were performed did comply with the requirement.
[3] There is no flammability requirements for the 3rd rail cover. The test was performed for investigative purposes.

Sample	12 s Vertical Flame	ASTM E162	ASTM D3765
Cab front window/Passenger area window	Not applicable	Complies	Not applicable
End cap/windscreen (FRP)	Not applicable	Does not comply	Not applicable

Nancy B. McAtee
Fire and Explosion Specialist

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Received: 07/24/2015	Completed: 08/10/2015	Letter: A	JB	P.O.#: NTSBP150035	Test Report #: 3-09025-0-
Client's Identification	Composition: Vinyl Seat Upholstery (Sample #1). Date of Mfg: 2006. Product End Use: Passenger Seat Covers. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: FAA 12-sec.Vert FAR 25.853(a) 131

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):

Additional Information: 3-4 Sections From Seat, Seat Back and Crash Pad Assemblies. The Material From All Samples Should Be The Same Material Regardless of Color or Size and Can Be Commingled/Mixed as Needed for Testing.

Category: Vertical Flammability Specifier: Transit Guidelines/Regs. PC:24H

TEST PERFORMED: 12 Second Vertical Flame Application FAR 25.853(a) and Appendix F Part I(a)(1)(ii) [previously 25.853(b)], as per Part 25 Appendix F Part I(b)(4), as modified by the transportation industry

RESULTS ARE REPORTED:

[x] Initially

[ ] After 24 hours water leaching, as per FTM 5830 (Code +100)

[ ] After 3 dry cleanings, as per ASTM D 2724 (Code +60)

[ ] After 5 launderings (machine wash Tumble Dry Moderate), as per ASTM D 2724: (Code +75)
- [ ] 105°F (20% or more wool, acetate, modacrylic, acrylic fabrics)
- [ ] 120°F (tricot, circular knits, woven nylon, print fabrics)
- [ ] 140°F (all other woven face fabrics)

[ ] After alternately specified client's cleaning instructions

RESULTS:

	Specimen #	Afterflame (seconds)	Burn Length (inches)	Melt Length* (inches)	Flaming Dripping, or Flaming Running (yes/no)
Length:	1	24.3	5.5	0	No
	2	67.4+	12.0	0	No
	3	48.3	6.2	0	No
	Avg	(46.7+)	(7.9)		
Width:	4	18.0	6.9	0	No
	5	16.9	6.5	0	No
	6	16.5	6.0	0	No
	Avg	(17.1)	(6.5)		

* NOTE: IN CERTAIN INSTANCES A PORTION OF THE MATERIAL UNDER TEST WILL BE DAMAGED BY THE BURNING PROCESS AND A FURTHER DEGRADATION WILL BE ATTRIBUTABLE TO SHRINKAGE OR MELTING AWAY FROM THE IGNITING FLAME. THE ACTUAL DAMAGED DISTANCE ATTRIBUTABLE TO BURNING IS ENTERED IN THE "BURN LENGTH" COLUMN. THE MELTED/SHRINKAGE DISTANCE IS ENTERED IN THE "MELT LENGTH" COLUMN.

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Received:07/24/2015	Completed:08/10/2015	Letter: A	JB	P.O.#: NTSBP150035	Test Report #: 3-09025-0-
Client's Identification	Composition: Vinyl Seat Upholstery (Sample #1). Date of Mfg: 2006. Product End Use: Passenger Seat Covers. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: FAA 12-sec.Vert FAR 25.853(a) 131

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

ACCEPTANCE CRITERIA: For Upholstery Fabrics --

Afterflame: 10.0 seconds maximum average
Burn Length: 6.0" maximum average
Flaming Dripping or Flaming Running: Not permitted

Note: Melt Length, when observed, is reported; however, it is not factored into the Acceptance Criteria.

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, Federal Register Notice dated 6/25/02
2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/1993
3. Amtrak Specification #352 Section 3.5 dated 1/29/1990
4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1
5. BART (Bay Area Rapid Transit)

REMARKS: "+" = Extinguished by technician at time noted and when product exceeded failure criteria.

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[ ] Complies; [x] Does not comply

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by Code of Federal Regulations Title 14 Part 25, revised as of January 1, 2013.

[redacted]

Robert I. Brown

AUG 17 2015

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Received:07/24/2015	Completed:08/07/2015	Letter: A1	JB	P.O.#: NTSBP150035	Test Report #: 3-09025-1-

Client's Identification Composition: Vinyl Seat Upholstery (Sample #1). Date of Mfg: 2006. Product End Use: Passenger Seat Covers. (see continuation)

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):

Additional Information: 3-4 Sections From Seat, Seat Back and Crash Pad Assemblies. The Material From All Samples Should Be The Same Regardless of Color or Size and Can Be Commingled/Mixed as Needed for Testing.

Category: Radiant Panel LE 2013; V 03/15 PC: 24H+ME /dl

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.050"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN: [ ] Rigid Material - 6" by 18"
[ ] Cellular Sheet Foam Materials - 6" by 18"
[ ] Fabric/Flexible Materials - 10" by 22"
[x] Actual seat covers - tested 6" by 18"

SPECIMEN PREPARATION:

[ ] No backing required, as specimens exceeded 0.75" in thickness.

[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).

[ ] The specimens were backed with 1/4 inch high density reinforced cement board.

[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.

[x] The face of each specimen was covered with a 1.0" hexagonal wire mesh screen.

[ ] The specimen was flexible material such that the top and bottom of the 10" by 22" specimen was wrapped around the back of the board with all slack removed.

BRIEF DESCRIPTION OF TEST: (see page 2 of 2)

RESULTS:

Specimen #	Flame Progression (mm:ss) 3.0"	6.0"	9.0"	12.0"	15.0"	Net Stack Rise°C	Q	FS	Flame Spread Index*	Flaming Dripping, or Flaming Running (yes/no)
1	00:15	00:19	00:23	01:00	02:33	38.3	8.3	26.7	221.6	No
2	00:15	00:22	00:28	00:58	FN	33.3	7.3	22.3	162.8	No
3	00:16	00:22	00:34	FN	FN	22.8	5.0	16.9	84.5	No
4	00:15	00:18	00:22	00:45	01:39	38.3	8.3	29.2	242.4	No
								Avg:	177.8	

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Client's Identification	Composition: Vinyl Seat Upholstery (Sample #1). Date of Mfg: 2006. Product End Use: Passenger Seat Covers. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

ABBREVIATIONS WHICH MAY BE USED IN RESULTS:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.
WM = Flame front was attributable to burning of the residue on the wire mesh.
SB = Still burning.

CALCULATION FACTORS: Etera board correction factor: 13°C
Beta: 26.16
Flux: 2.8 - 1.7 - 0.8 (Flux Transducer #184112)

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The test is completed when the flame front has progressed to the 15" mark, or after an exposure time of 15 minutes, whichever occurs first. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, result in a Flame Spread Index.

NOTES: * While the Standard calls out "Radiant Panel Index", Govmark reports "Flame Spread Index", since this is the terminology used in most Code specifications. "Flame Spread Index" and "Radiant Panel Index" are identical for the purposes of this report.

** Flashing is defined as a flame front of 3 seconds or less in duration. Where ANY flashing has occurred, an individual specimen's Flame Spread Index is understood to be qualified as "(Flashing)".

REMARKS:

Specimen #	Non Sustained (Flashing**) Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor (yes/no)
1	Yes	00:07	SB	15:00	No
2	Yes	00:08	03:50	15:00	No
3	Yes	00:07	03:26	15:00	No
4	Yes	00:06	SB	15:00	No

ABBREVIATIONS WHICH MAY BE USED IN "REMARKS":
DNI = Did not ignite
SB = Still burning at test end

ACCEPTANCE CRITERIA: None cited.

CONCLUSION: Not applicable.

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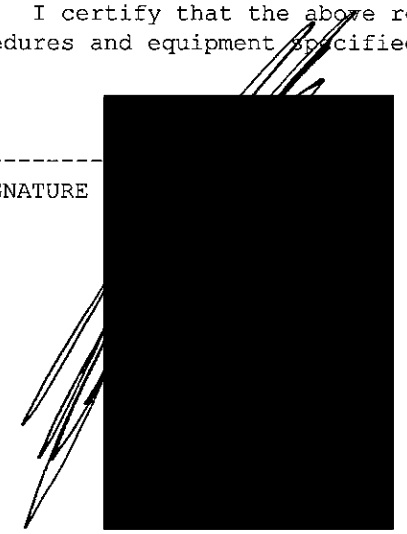
Received:07/24/2015	Completed:08/07/2015	Letter: A1	JB	P.O.#: NTSBP150035	Test Report #: 3-09025-1-
Client's Identification	Composition: Vinyl Seat Upholstery (Sample #1). Date of Mfg: 2006. Product End Use: Passenger Seat Covers. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.



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Received:07/24/2015	Completed:08/10/2015	Letter: B	JS	P.O.#: NTSBP150035	Test Report #: 3-09026-0-
Client's Identification	Composition: Gray Polychloroprene Latex Foam (Sample #2). Date of Mfg: 2006. Product End Use: Passenger Seat Back, Headrest and Crash Pad Cushions. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM D 3675 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):

Additional Information: 5 Separate Foam Samples from One Seat Assembly. The Material From all Samples Should Be The Same Material Regardless of Color or Size and Can Be Commingled/Mixed as Needed for Testing.

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H
LE: 2014 V 03/15

TEST PERFORMED: ASTM D 3675 - Standard Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source

Product Category: Cushion Material

[x] Tested initially
[ ] Tested after 24 hours water leaching FTM 5830 (Code +250)
[ ] Tested after ___ dry cleaning(s) ASTM D 2724 (Code +20/C)
[ ] Tested after 80,000 cycles in accordance with ASTM D 3574-95, Test I(3) Dynamic Fatigue by Constant Force Pounding (Code +1200)

SPECIMEN PREPARATION: The back and sides of each specimen were wrapped with 0.002" thick aluminum foil. The specimens were backed by a 0.25" insulation board. The face of each specimen was covered with a 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

THICKNESS: Actual thickness of material submitted: 2.75"
Specified test thickness: 1.0"
Actual thickness of material tested: 2.75"

RESULTS:

Specimen	Flame Progression (mm:ss) 3.0"	6.0"	9.0"	12.0"	15.0"	Net Stack Rise°C	Q	FS	Flame Spread Index	Flaming Dripping, or Flaming Running (yes/no)
1	00:20	00:23	FN	FN	FN	1.1	0.2	11.4	2.3	No
2	00:20	00:23	FN	FN	FN	2.8	0.6	11.4	6.8	No
3	00:18	00:21	FN	FN	FN	0.6	0.1	12.4	1.2	No
4	00:10	00:16	FN	FN	FN	0.6	0.1	16.0	1.6	No
								Avg:	3.0	

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Received:07/24/2015	Completed:08/10/2015	Letter: B	JS	P.O.#: NTSBP150035	Test Report #:	3-09026-0-

Client's Identification Composition: Gray Polychloroprene Latex Foam (Sample #2). Date of Mfg: 2006. Product End Use: Passenger Seat Back, Headrest and Crash Pad Cushions. (see continuation)

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM D 3675 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

ACCEPTANCE CRITERIA: For Cushion Materials --
1. Flame Spread Index: Shall not exceed 25
2. Flaming Dripping or Flaming Running: Not permitted.

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:
[x] Complies; [ ] Does not comply

ABBREVIATIONS WHICH MAY BE USED: F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.

CALCULATION FACTORS: Etera board correction factor: 15°C
Beta: 26.16
FLUX: 2.8 - 1.7 - 0.9 (Flux Transducer #184112)

REMARKS: For all specimens -- The flame front was attributable to:
[x] Burning of the specimen; [ ] Burning of residue on the wire mesh screen.

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	Flaming Drips (yes/no)	Test End (mm:ss)
1	Yes	00:10	No	15:00
2	Yes	00:06	No	15:00
3	Yes	00:05	No	15:00
4	Yes	00:04	No	15:00

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, Federal Register Notice dated 6/26/02

2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/1993

3. Amtrak Specification #352 Section 3.5 dated 1/29/1990

4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

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Received:07/24/2015	Completed:08/10/2015	Letter: B	JS	P.O.#: NTSBP150035	Test Report #: 3-09026-0-
Client's Identification	Composition: Gray Polychloroprene Latex Foam (Sample #2). Date of Mfg: 2006. Product End Use: Passenger Seat Back, Headrest and Crash Pad Cushions. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM D 3675 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM D 3675.

[redacted]

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Received: 07/24/2015	Completed: 08/10/2015	Letter: C	JS	P.O.#: NTSBP150035	Test Report #: 3-09027-0-RV
Client's Identification	Composition: White Silicone Foam (Sample #3). Date of Mfg: 2006. Product End Use: Passenger Seat Cushions. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM D 3675 RVNC

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):

Additional Information: 2 Separate Foam Samples from Two Different Seat Assemblies. The Material From all Samples Should Be The Same Material Regardless of Color or Size and Can Be Commingled/Mixed as Needed for Testing.

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H
LE: 2014 V 03/15

TEST PERFORMED: ASTM D 3675 - Standard Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source

Product Category: Cushion Material

[x] Tested initially
[ ] Tested after 24 hours water leaching FTM 5830 (Code +250)
[ ] Tested after ___ dry cleaning(s) ASTM D 2724 (Code +20/C)
[ ] Tested after 80,000 cycles in accordance with ASTM D 3574-95, Test I(3) Dynamic Fatigue by Constant Force Pounding (Code +1200)

SPECIMEN PREPARATION: The back and sides of each specimen were wrapped with 0.002" thick aluminum foil. The specimens were backed by a 0.25" insulation board. The face of each specimen was covered with a 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

THICKNESS: Actual thickness of material submitted: 1.913"
Specified test thickness: 1.0"
Actual thickness of material tested: 1.913"

RESULTS:

Specimen	Flame Progression (mm:ss) 3.0"	6.0"	9.0"	12.0"	15.0"	Net Stack Rise°C	Q	FS	Flame Spread Index	Flaming Dripping, or Flaming Running (yes/no)
1	00:09	00:13	00:30	00:54	05:57	20.0	4.4	25.7	113.1	No
2	00:08	00:12	00:24	00:48	01:30	18.3	4.0	29.9	119.6	No
3	00:07	00:12	00:20	00:35	01:45	8.9	1.9	33.4	63.5	No
4	00:08	00:11	00:20	00:40	01:32	9.4	2.0	33.7	67.4	No
								Avg:	(90.9)	

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Received: 07/24/2015	Completed: 08/10/2015	Letter: C	JS	P.O.#: NTSBP150035	Test Report #: 3-09027-0-RV
Client's Identification	Composition: White Silicone Foam (Sample #3). Date of Mfg: 2006. Product End Use: Passenger Seat Cushions. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM D 3675 RVNC

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

ACCEPTANCE CRITERIA: For Cushion Materials --
1. Flame Spread Index: Shall not exceed 25
2. Flaming Dripping or Flaming Running: Not permitted.

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:
[ ] Complies; [x] Does not comply

ABBREVIATIONS WHICH MAY BE USED: F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.

CALCULATION FACTORS: Etera board correction factor: 15°C
Beta: 26.16
FLUX: 2.8 - 1.7 - 0.9 (Flux Transducer #184112)

REMARKS: For all specimens -- The flame front was attributable to:
[x] Burning of the specimen; [ ] Burning of residue on the wire mesh screen.

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	Flaming Drips (yes/no)	Test End (mm:ss)
1	Yes	00:01	No	15:00
2	Yes	00:01	No	15:00
3	Yes	00:01	No	15:00
4	Yes	00:02	No	15:00

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, Federal Register Notice dated 6/26/02

2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/1993

3. Amtrak Specification #352 Section 3.5 dated 1/29/1990

4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

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Received: 07/24/2015	Completed: 08/10/2015	Letter: C	JS	P.O.#: NTSBP150035	Test Report #: 3-09027-0-RV
Client's Identification	Composition: White Silicone Foam (Sample #3). Date of Mfg: 2006. Product End Use: Passenger Seat Cushions. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM D 3675 RVNC

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM D 3675.

[redacted]

AUTHORIZED SIGNATURE
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RV.08.26.15 /tm

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Received:07/24/2015	Completed:08/03/2015	Letter: D	JS	P.O.#: NTSBP150035	Test Report #:	3-09028-0-
Client's Identification	Composition: FRP Laminate Seat Back Shell (Sample #4). Date of Mfg: 2006.					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H+ME /jd

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.150"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN PREPARATION:
[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[ ] The face of each specimen was covered with 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

RESULTS:

	Flame Progression (mm:ss)					Net Stack			Flame Spread	Flaming Dripping, or Flaming Running
Specimen	3.0"	6.0"	9.0"	12.0"	15.0"	Rise°C	Q	FS	Index	(yes/no)
1	01:38	02:29	04:26	11:32	FN	60.0	13.1	3.2	41.9	No
2	01:41	02:20	04:00	13:05	FN	51.1	11.1	3.4	37.7	No
3	02:02	02:32	03:45	07:59	FN	46.7	10.2	3.6	36.7	No
4	02:07	03:19	04:38	10:55	FN	52.8	11.5	3.1	35.6	No
								Avg:	(38.0)	

ABBREVIATIONS USED:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.

CALCULATION FACTORS:
Etera board correction factor: 16°C
Beta: 26.16
FLUX: 2.7 - 1.7 - 0.7 (Flux Transducer #184112)

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Received:07/24/2015	Completed:08/03/2015	Letter: D	JS	P.O.#: NTSBP150035	Test Report #:	3-09028-0-
Client's Identification	Composition: FRP Laminate Seat Back Shell (Sample #4). Date of Mfg: 2006.					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

REMARKS:

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor (yes/no)
1	Yes	00:59	SB	15:00	No
2	Yes	01:05	SB	15:00	No
3	Yes	00:55	SB	15:00	No
4	Yes	01:11	SB	15:00	No

ACCEPTANCE CRITERIA: For panels*, seats, mattress frames --

1. Flame Spread Index shall not exceed 35.
2. Flaming dripping, or flaming running is not permitted.

(* Panels include: Walls, ceilings, partition tables & shelves, HVAC ducting)

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, 49 CFR 238 Appendix B

2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/93

3. Amtrak Specification #352 Section 3.5 dated 1/29/90

4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[ ] Complies; [x] Does not comply

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

[redacted]

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Robert I. Brown AUG 17 2015

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Received:07/24/2015	Completed:08/06/2015	Letter: E	JS	P.O.#: NTSBP150035	Test Report #:	3-09029-0-
Client's Identification	Composition: FRP Laminate Panel (of Similar Construction of Toilet Module Walls) (Sample #5). Date of Mfg: 2006.					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H+ME /jd

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.148"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN PREPARATION:
[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[ ] The face of each specimen was covered with 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

RESULTS:

Specimen	Flame Progression (mm:ss) 3.0"	6.0"	9.0"	12.0"	15.0"	Net Stack Rise°C	Q	FS	Flame Spread Index	Flaming Dripping, or Flaming Running (yes/no)
1	01:36	02:57	07:07	FN	FN	10.6	2.3	2.6	6.0	No
2	03:00	03:48	06:02	13:40	FN	22.2	4.8	2.6	12.5	No
3	03:23	04:05	06:20	FN	FN	27.2	5.9	2.4	14.2	No
4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
								Avg:	10.9	

ABBREVIATIONS USED:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.
NA = Not available.
SB = Still burning at test end.

CALCULATION FACTORS:
Etera board correction factor: 14°C
Beta: 26.16
FLUX: 2.8 - 1.7 - 0.8 (Flux Transducer #184112)

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Received:07/24/2015	Completed:08/06/2015	Letter: E	JS	P.O.#: NTSBP150035	Test Report #:	3-09029-0-
Client's Identification	Composition: FRP Laminate Panel (of Similar Construction of Toilet Module Walls) (Sample #5). Date of Mfg: 2006.					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

REMARKS: Only had enough to test 3 specimens.

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor (yes/no)
1	Yes	01:16	12:45	15:00	No
2	Yes	01:00	SB	15:00	No
3	Yes	01:20	SB	15:00	No
4	NA	NA	NA	15:00	NA

ACCEPTANCE CRITERIA: For panels*, seats, mattress frames --

1. Flame Spread Index shall not exceed 35.
2. Flaming dripping, or flaming running is not permitted.

(* Panels include: Walls, ceilings, partition tables & shelves, HVAC ducting)

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, 49 CFR 238 Appendix B

2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/93

3. Amtrak Specification #352 Section 3.5 dated 1/29/90

4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[ ] Complies; [ ] Does not comply; [x] Inconclusive - 3 specimens available. Standard requires 4 specimens tested.

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

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Received:07/24/2015	Completed:08/06/2015	Letter: F	JB	P.O.#: NTSBP150035	Test Report #: 3-09030-0-
Client's Identification	Composition: Side Door Pocket Panel (Melamine-Aluminium Panel with an Aluminum Honeycomb Core) (Sample #6). Date of Mfg: 2006. (see continuation)				

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):

Additional Information: 3 Samples Were Submitted. These are 3 Pieces of The Same Panel Cut Down to Fit in Box and The Pieces Can Be Commingled For Testing.

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H+ME /jd

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.375"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN PREPARATION:
[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[ ] The face of each specimen was covered with 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

RESULTS:

Specimen	Flame Progression (mm:ss) 3.0"	6.0"	9.0"	12.0"	15.0"	Net Stack Rise°C	Q	FS	Flame Spread Index	Flaming Dripping, or Flaming Running (yes/no)
1	01:05	FN	FN	FN	FN	10.6	2.3	1.9	4.4	No
2	01:57	FN	FN	FN	FN	3.9	0.8	1.5	1.2	No
3	02:37	FN	FN	FN	FN	4.4	1.0	1.4	1.4	No
4	02:14	FN	FN	FN	FN	1.1	0.2	1.4	0.3	No
								Avg:	1.8	

ABBREVIATIONS USED:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.

CALCULATION FACTORS:
Etera board correction factor: 15°C
Beta: 26.16
FLUX: 2.9 - 1.7 - 0.8 (Flux Transducer #184112)

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Received:07/24/2015	Completed:08/06/2015	Letter: F	JB	P.O.#: NTSBP150035	Test Report #:	3-09030-0-
Client's Identification	Composition: Side Door Pocket Panel (Melamine-Aluminium Panel with an Aluminum Honeycomb Core) (Sample #6). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

REMARKS:

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor (yes/no)
1	Yes	01:38	04:40	15:00	No
2	Yes	01:39	04:24	15:00	No
3	Yes	02:15	04:35	15:00	No
4	Yes	01:51	03:21	15:00	No

ACCEPTANCE CRITERIA: For panels*, seats, mattress frames --

1. Flame Spread Index shall not exceed 35.
2. Flaming dripping, or flaming running is not permitted.

(* Panels include: Walls, ceilings, partition tables & shelves, HVAC ducting)

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, 49 CFR 238 Appendix B
2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/93
3. Amtrak Specification #352 Section 3.5 dated 1/29/90
4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[x] Complies; [ ] Does not comply

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

[redacted]

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Received:07/24/2015	Completed:08/04/2015	Letter: G	JB	P.O.#: NTSBP150035	Test Report #:	3-09031-0-
Client's Identification	Composition: Window Mask Panel (FRP Laminate) (Sample #7). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):
Additional Information: 2 Sections of The Window Mask Were Submitted. The Two Sections Should be The Same Material And Can Commingled For Testing If Needed.

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H+ME /jd

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.12"
TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN PREPARATION:
[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[ ] The face of each specimen was covered with 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

RESULTS:	Flame Progression (mm:ss)					Net Stack			Flame Spread	Flaming Dripping, or Flaming Running
Specimen	3.0"	6.0"	9.0"	12.0"	15.0"	Rise°C	Q	FS	Index	(yes/no)
1	01:30	02:26	06:34	FN	FN	5.0	1.1	2.8	3.1	No
2	01:38	02:39	12:31	13:44	FN	8.3	1.8	2.9	5.2	No
3	01:31	02:46	07:01	FN	FN	4.4	1.0	2.6	2.6	No
4	01:53	02:26	11:27	13:33	FN	21.1	4.6	3.0	13.8	No
								Avg:	6.2	

ABBREVIATIONS USED:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.
SB = Still burning at test end.

CALCULATION FACTORS:
Etera board correction factor: 12°C
Beta: 26.16
FLUX: 2.7 - 1.7 - 0.7 Flux Transducer #184112)

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Received:07/24/2015	Completed:08/04/2015	Letter: G	JB	P.O.#: NTSBP150035	Test Report #:	3-09031-0-
Client's Identification	Composition: Window Mask Panel (FRP Laminate) (Sample #7). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

REMARKS:

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor (yes/no)
1	Yes	00:46	SB	15:00	No
2	Yes	00:52	SB	15:00	No
3	Yes	00:49	SB	15:00	No
4	Yes	00:39	SB	15:00	No

ACCEPTANCE CRITERIA: For panels*, seats, mattress frames --

1. Flame Spread Index shall not exceed 35.
2. Flaming dripping, or flaming running is not permitted.

(* Panels include: Walls, ceilings, partition tables & shelves, HVAC ducting)

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, 49 CFR 238 Appendix B
2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/93
3. Amtrak Specification #352 Section 3.5 dated 1/29/90
4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[x] Complies; [ ] Does not comply

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

[redacted]

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Received:07/24/2015	Completed:08/07/2015	Letter: H	JS	P.O.#: NTSBP150035	Test Report #:	3-09032-0-
Client's Identification	Composition: Ceiling Panel (Melamine-Aluminium Panel) (Sample #8). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):

Additional Information: Two Different Panels Submitted. Both Samples Should Be The Same Material, Are From The Same Train Car And Can Be Commingled For Testing If Needed.

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H+ME /jd

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.103"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN PREPARATION:
[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[ ] The face of each specimen was covered with 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

RESULTS:

Specimen	Flame Progression (mm:ss) 3.0"	6.0"	9.0"	12.0"	15.0"	Net Stack Rise°C	Q	FS	Flame Spread Index	Flaming Dripping, or Flaming Running (yes/no)
1	03:09	FN	FN	FN	FN	1.7	0.4	1.3	0.5	No
2	03:12	FN	FN	FN	FN	10.6	2.3	1.3	3.0	No
3	03:36	FN	FN	FN	FN	3.3	0.7	1.3	0.9	No
4	01:45	FN	FN	FN	FN	2.8	0.6	1.6	1.0	No
								Avg:	1.4	

ABBREVIATIONS USED:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.

CALCULATION FACTORS:
Etera board correction factor: 13°C
Beta: 26.16
FLUX: 2.8 - 1.7 - 0.8 (Flux Transducer #184112)

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Received: 07/24/2015	Completed: 08/07/2015	Letter: H	JS	P.O.#: NTSBP150035	Test Report #:	3-09032-0-
Client's Identification	Composition: Ceiling Panel (Melamine-Aluminium Panel) (Sample #8). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

REMARKS:

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor (yes/no)
1	Yes	02:31	03:39	15:00	No
2	Yes	02:43	03:35	15:00	No
3	Yes	02:08	04:21	15:00	No
4	Yes	01:20	02:00	15:00	No

ACCEPTANCE CRITERIA: For panels*, seats, mattress frames --

1. Flame Spread Index shall not exceed 35.
2. Flaming dripping, or flaming running is not permitted.

(* Panels include: Walls, ceilings, partition tables & shelves, HVAC ducting)

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, 49 CFR 238 Appendix B

2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/93

3. Amtrak Specification #352 Section 3.5 dated 1/29/90

4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[x] Complies; [ ] Does not comply

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

[redacted]

Robert I. Brown AUG 17 2015

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Received:07/24/2015	Completed:08/06/2015	Letter: I	JS	P.O.#: NTSBP150035	Test Report #:	3-09033-0-
Client's Identification	Composition: 3rd Rail Cover (Possibly Made of Durex or Similar Polymer) (Sample #9). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):

Additional Information: The Component Does Not Have A Flammability Requirement That it Meets so Flammability Properties Are Unknown. Multiple Samples Provided And Can Be Commingled For Testing.

Category: Radiant Panel LE 2013; V 03/15 PC: 24H+ME /dl

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.158"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN: [x] Rigid Material - 6" by 18"
[ ] Cellular Sheet Foam Materials - 6" by 18"
[ ] Fabric/Flexible Materials - 10" by 22"
[ ] Cable:

SPECIMEN PREPARATION:

[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[ ] The specimens were backed with 1/4 inch high density reinforced cement board.
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[x] The face of each specimen was covered with a 1.0" hexagonal wire mesh screen.
[ ] The specimen was flexible material such that the top and bottom of the 10" by 22" specimen was wrapped around the back of the board with all slack removed.

BRIEF DESCRIPTION OF TEST: (see page 2 of 2)

RESULTS:

Specimen #	Flame Progression (mm:ss) 3.0"	6.0"	9.0"	12.0"	15.0"	Net Stack Rise°C	Q	FS	Flame Spread Index*	Flaming Dripping, or Flaming Running (yes/no)
1	00:45	01:13	03:10	FN	FN	32.8	7.1	4.8	34.1	Yes
2	00:54	01:38	FN	FN	FN	32.8	7.1	3.4	24.1	Yes
3	00:45	01:10	02:19	03:30	FN	37.8	8.2	6.1	50.0	Yes
4	00:42	01:20	03:24	04:53	FN	48.9	10.7	5.1	54.6	Yes
								Avg:	40.7	

ABBREVIATIONS WHICH MAY BE USED IN RESULTS:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.
WM = Flame front was attributable to burning of the residue on the wire mesh.

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e-mail: testing@govmark.com

Received:07/24/2015	Completed:08/06/2015	Letter: I	JS	P.O.#: NTSBP150035	Test Report #:	3-09033-0-
Client's Identification	Composition: 3rd Rail Cover (Possibly Made of Durex or Similar Polymer) (Sample #9). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CALCULATION FACTORS: Etera board correction factor: 15°C
Beta: 26.16
Flux: 2.8 - 1.7 - 0.8 (Flux Transducer #184112)

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The test is completed when the flame front has progressed to the 15" mark, or after an exposure time of 15 minutes, whichever occurs first. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, result in a Flame Spread Index.

NOTES: * While the Standard calls out "Radiant Panel Index", Govmark reports "Flame Spread Index", since this is the terminology used in most Code specifications. "Flame Spread Index" and "Radiant Panel Index" are identical for the purposes of this report.

** Flashing is defined as a flame front of 3 seconds or less in duration. Where ANY flashing has occurred, an individual specimen's Flame Spread Index is understood to be qualified as "(Flashing)".

REMARKS:

Specimen #	Non Sustained (Flashing**) Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor (yes/no)
1	Yes	00:17	11:49	15:00	Yes
2	Yes	00:12	11:22	15:00	No
3	Yes	00:16	09:30	15:00	Yes
4	Yes	00:15	08:33	15:00	Yes

ABBREVIATIONS WHICH MAY BE USED IN "REMARKS":
DNI = Did not ignite
SB = Still burning at test end

ACCEPTANCE CRITERIA: None cited.

CONCLUSION: Not applicable.

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Received:07/24/2015	Completed:08/06/2015	Letter: I	JS	P.O.#: NTSBP150035	Test Report #:	3-09033-0-
Client's Identification	Composition: 3rd Rail Cover (Possibly Made of Durex or Similar Polymer) (Sample #9). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

[redacted]

AUTHORIZED SIGNATURE
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Received:07/24/2015	Completed:08/06/2015	Letter: J	JB	P.O.#: NTSBP150035	Test Report #:	3-09034-0-
Client's Identification	Composition: Polycarbonate Fluorescent Light Lens (Sample #10). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):

Additional Information: 2 Separate Lens Samples From Two Different Lights Were Submitted. The Material from All Samples Should be The Same Material And Can Be Commingled/Mixed as Needed For Testing.

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H+ME /jd

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.127"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN PREPARATION:
[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[x] The face of each specimen was covered with 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

RESULTS:	Flame Progression (mm:ss)					Net Stack				Flaming Dripping, or Flaming
Specimen	3.0"	6.0"	9.0"	12.0"	15.0"	Rise°C	Q	FS	Flame Spread Index	Running* (yes/no)
1	01:32	02:13	03:05	04:11	07:12	31.7	6.9	5.1	35.2	Yes
2	01:31	02:10	02:43	04:06	07:37	31.7	6.9	5.3	36.6	Yes
3	01:09	01:58	02:25	04:03	05:40	27.2	5.9	5.9	34.8	Yes
4	01:25	02:15	03:03	04:15	07:12	23.9	5.2	5.1	26.5	Yes
								Avg:	33.3	

ABBREVIATIONS USED:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.
SB = Still burning at test end.

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Received: 07/24/2015	Completed: 08/06/2015	Letter: J	JB	P.O.#: NTSBP150035	Test Report #:	3-09034-0-
Client's Identification	Composition: Polycarbonate Fluorescent Light Lens (Sample #10). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CALCULATION FACTORS:
Etera board correction factor: 15°C
Beta: 26.16
FLUX: 2.8 - 1.7 - 0.8 (Flux Transducer #184112)

REMARKS:

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor* (yes/no)
1	Yes	00:16	SB	15:00	Yes
2	Yes	00:28	SB	15:00	Yes
3	Yes	00:14	SB	15:00	Yes
4	Yes	00:17	SB	15:00	Yes

ACCEPTANCE CRITERIA: For Light Diffusers, Windows and Transparent Plastic Windscreens

1. Flame Spread Index shall not exceed 100.

*Flaming dripping and/or flamming running is recorded for informational purposes only and does not enter into the Acceptance Criteria

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, 49 CFR 238 Appendix B

2. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[x] Complies; [ ] Does not comply

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Received:07/24/2015	Completed:08/06/2015	Letter: J	JB	P.O.#: NTSBP150035	Test Report #:	3-09034-0-
Client's Identification	Composition: Polycarbonate Fluorescent Light Lens (Sample #10). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

[redacted]

AUTHORIZED SIGNATURE
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Received: 07/24/2015	Completed: 08/05/2015	Letter: K	JB	P.O.#: NTSBP150035	Test Report #:	3-09035-0-
Client's Identification	Composition: Polycarbonate Window Samples (Sample #11). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):
Additional Information: 3 Separate Window Samples Were Submitted. The Material From All Samples Should Be The Same Material And Can Be Commingled/Mixed as Needed For Testing.

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H+ME /jd

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.485"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN PREPARATION:
[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[x] The face of each specimen was covered with 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

RESULTS:

Specimen	Flame Progression (mm:ss) 3.0"	6.0"	9.0"	12.0"	15.0"	Net Stack Rise°C	Q	FS	Flame Spread Index	Flaming Dripping, or Flaming Running* (yes/no)
1	02:10	03:15	04:25	05:50	09:45	43.3	9.4	4.0	37.6	Yes
2	01:26	02:34	04:07	05:38	08:03	27.8	6.1	4.3	26.2	Yes
3	02:13	03:41	05:18	07:52	10:33	37.2	8.1	3.5	28.3	Yes
4	01:35	02:44	03:49	05:23	07:31	17.8	3.9	4.5	17.6	Yes
								Avg:	27.4	

ABBREVIATIONS USED:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.
SB = Still burning at test end.

CALCULATION FACTORS:
Etera board correction factor: 14°C
Beta: 26.16
FLUX: 2.8 - 1.7 - 0.8 (Flux Transducer #184112)

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Received:07/24/2015	Completed:08/05/2015	Letter: K	JB	P.O.#: NTSBP150035	Test Report #:	3-09035-0-
Client's Identification	Composition: Polycarbonate Window Samples (Sample #11). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

REMARKS:

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor* (yes/no)
1	Yes	00:16	SB	15:00	Yes
2	Yes	00:13	SB	15:00	Yes
3	Yes	00:24	SB	15:00	Yes
4	Yes	00:18	SB	15:00	Yes

ACCEPTANCE CRITERIA: For Light Diffusers, Windows and Transparent Plastic Windscreens

1. Flame Spread Index shall not exceed 100.

*Flaming dripping and/or flamming running is recorded for informational purposes only and does not enter into the Acceptance Criteria

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, 49 CFR 238 Appendix B

2. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[x] Complies; [ ] Does not comply

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

[redacted]

Robert I. Brown
AUG 17 2015

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Received:07/24/2015	Completed:08/04/2015	Letter: L	JB	P.O.#: NTSBP150035	Test Report #:	3-09036-0-
Client's Identification	Composition: FRP End Cap (Sample #12). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

CLIENT'S IDENTIFICATION (continuation):
Additional Information: 2 Separate Samples Were Submitted. These Samples Are The Same Door Cut in Half The Samples Can Be Commingled/Mixed as Needed For Testing.

Category: Radiant Panel Specifier: Transit Guidelines & Regs. PC: 24H+ME /jd

APPROXIMATE THICKNESS OF MATERIAL (as measured by Govmark): 0.167"

TEST PERFORMED: ASTM E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

SPECIMEN PREPARATION:
[ ] No backing required, as specimens exceeded 0.75" in thickness.
[x] The specimens were backed by a 0.5" Etera board (a cement asbestos substitute).
[x] The back and sides of each specimen were wrapped with 0.002" thick aluminum foil.
[ ] The face of each specimen was covered with 1.0" hexagonal wire mesh screen.

BRIEF DESCRIPTION OF TEST: The test specimen faces a radiant heat source. At the beginning of the test period an igniting flame impinges at the top of the specimen. Visual observation is made of the downward progression of the flame front. The heat given off by the burning specimen is automatically recorded. The combination of the two factors, flame front progression and heat, results in a Flame Spread Index.

RESULTS:

	Flame Progression (mm:ss)					Net Stack			Flame Spread	Flaming Dripping, or Flaming Running
Specimen	3.0"	6.0"	9.0"	12.0"	15.0"	Rise°C	Q	FS	Index	(yes/no)
1	00:49	01:19	02:20	FN	FN	8.3	1.8	5.0	9.0	(Yes)
2	01:04	01:35	02:16	04:01	FN	36.1	7.9	5.6	44.2	No
3	00:51	01:39	02:34	04:20	FN	8.9	1.9	5.1	9.7	No
4	00:41	01:22	02:40	04:42	07:44	36.7	8.0	5.6	44.6	(Yes)
								Avg:	26.9	

ABBREVIATIONS USED:
F = Flashed beyond benchmark.
FN = Flame front did not reach this benchmark.
SB = Still burning at test end.

CALCULATION FACTORS:
Etera board correction factor: 12°C
Beta: 26.16
FLUX: 2.7 - 1.7 - 0.7 Flux Transducer #184112)

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Received: 07/24/2015	Completed: 08/04/2015	Letter: L	JB	P.O.#: NTSBP150035	Test Report #:	3-09036-0-
Client's Identification	Composition: FRP End Cap (Sample #12). Date of Mfg: 2006. (see continuation)					

Tested For: **Nancy B. McAtee**
NTSB
490 L'Enfant Plaza, SW
Washington, DC 20594

Key Test: ASTM E 162 521

Tel: 1-(202)-314-6509 **Ext:**
Fax: 1-( )- -

REMARKS:

Specimen #	Non Sustained Flame Front Off Gas Ignition (yes/no)	Sustained Flame Front Ignition at (mm:ss)	All Flaming Out (mm:ss)	Test End (mm:ss)	Drips Flame on Test Floor (yes/no)
1	Yes	00:19	SB	15:00	(Yes)
2	Yes	00:15	SB	15:00	No
3	Yes	00:18	SB	15:00	No
4	Yes	00:16	SB	15:00	(Yes)

ACCEPTANCE CRITERIA: For panels*, seats, mattress frames --

1. Flame Spread Index shall not exceed 35.
2. Flaming dripping, or flaming running is not permitted.

(* Panels include: Walls, ceilings, partition tables & shelves, HVAC ducting)

SPECIFIERS:

1. Federal Railroad Administration Test Procedures & Performance Criteria, 49 CFR 238 Appendix B

2. UMTA Recommended Fire Safety Practices for Transit Bus & Van Materials Selection Docket #90-A published 10/20/93

3. Amtrak Specification #352 Section 3.5 dated 1/29/90

4. NFPA 130 Section 8.4 Flammability and Smoke Emission; Table 8.4.1

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[ ] Complies; [x] Does not comply

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by ASTM E 162.

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Robert I. Brown

AUG 17 2015

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