Seat Round Robin

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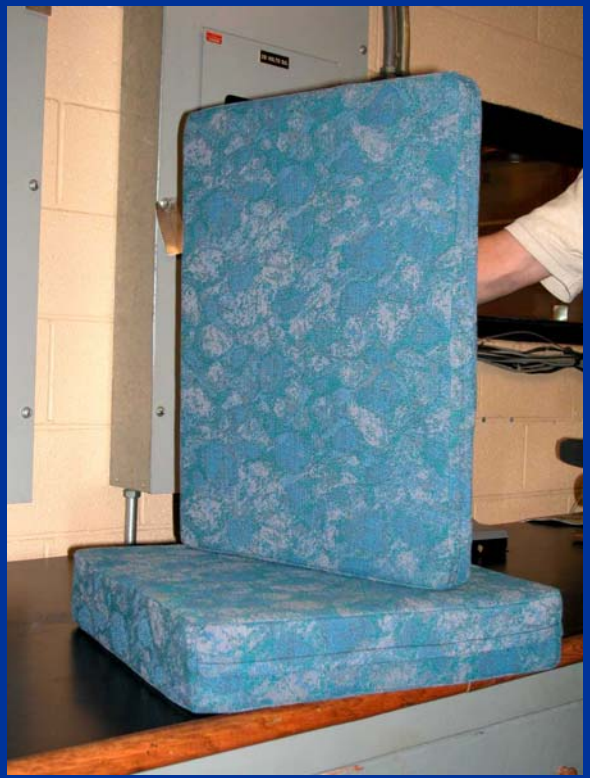
Aircraft Seats
World Wide Round Robin Testing

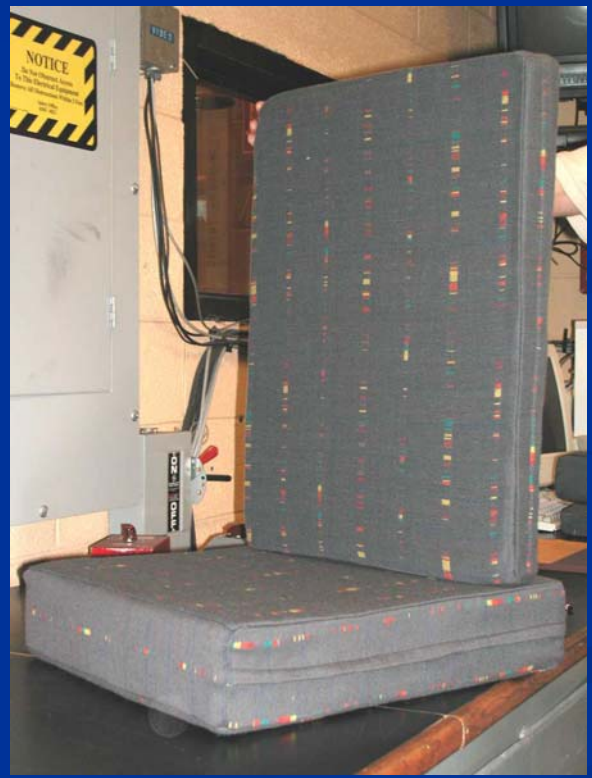
- Currently, 8 labs in the United States have oil burners set up for seat testing:
  - Boeing Seattle
  - Accufleet
  - Starr Aircraft Products
  - Custom Products
  - Flame Out
  - Skandia
  - Govmark Labs
  - Chestnut Ridge

Aircraft Seats

World Wide Round Robin Testing

Test Samples





Aircraft Seats
World Wide Round Robin Testing

- Testing is complete in the US
- Testing has not yet started outside the US

Aircraft Seats

World Wide Round Robin Testing

Comparison of Test Methods

Lab	Rule	Handbook
A		Yes
B	Yes	
C		Yes
D	Yes	
E		Yes
F		Yes
G		Yes
H	Yes	
I	Yes	

Aircraft Seats
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Test Method, Lab Equipment and Fuel Differences

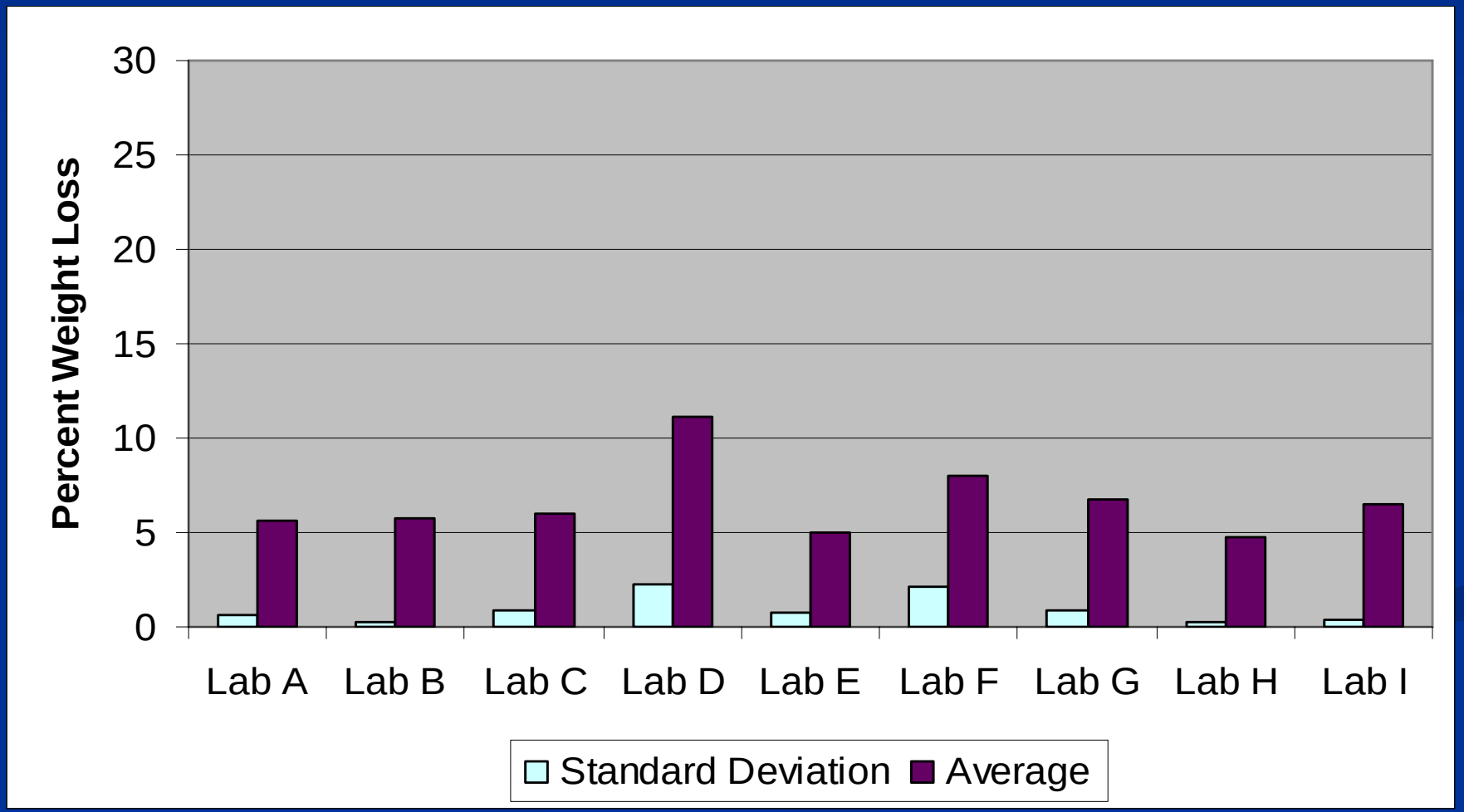
Lab	Test Method	Oil Burner Fuel	Nozzle Type	Air Stabilizer
A	Handbook	JP8	80° CC 2.0 gph*	Tabs
B	Rule	Jet A	80° AR 2.25 gph	No
C	Handbook	No. 2 fuel oil	80° PLP 2.25 gph	Static Disk
D	Rule	No. 2 diesel	Unknown	Unknown
E	Handbook	No.2 home heating oil	80° CC 2.0 gph	Tabs and Static Disk
F	Handbook	Jet A	80° CC 2.0 gph	No
G	Handbook	Jet A	80° AR 2.25 gph	No
H	Rule	No. 2 home heating oil	80° CC 2.25 gph	Tabs
I	Rule	No. 2 kerosene	80°AR 2.25 gph	Static Disk

* gph = gallons per hour

Aircraft Seats

World Wide Round Robin Testing

Fire Hardened Foam 1



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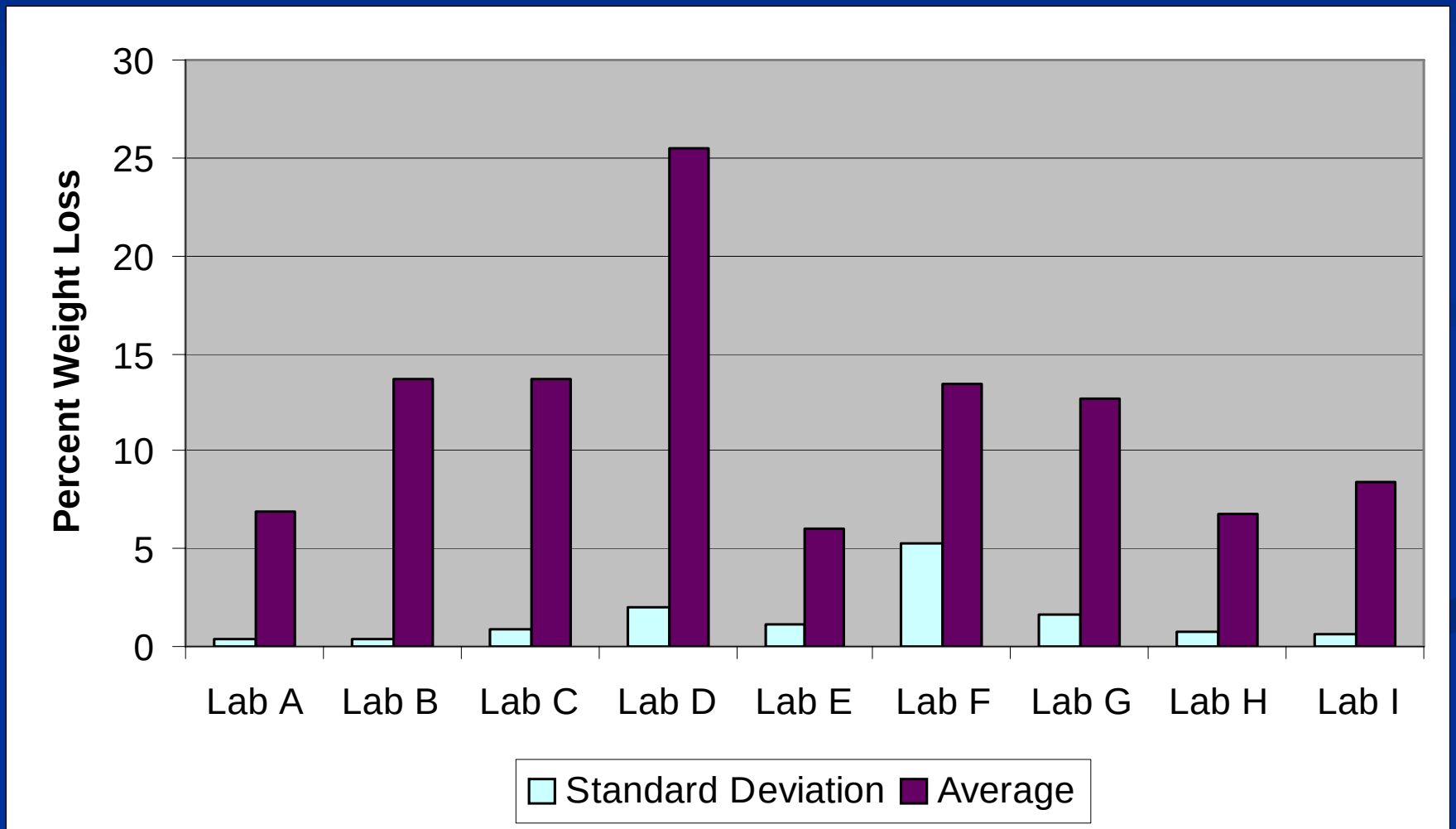
World Wide Round Robin Testing

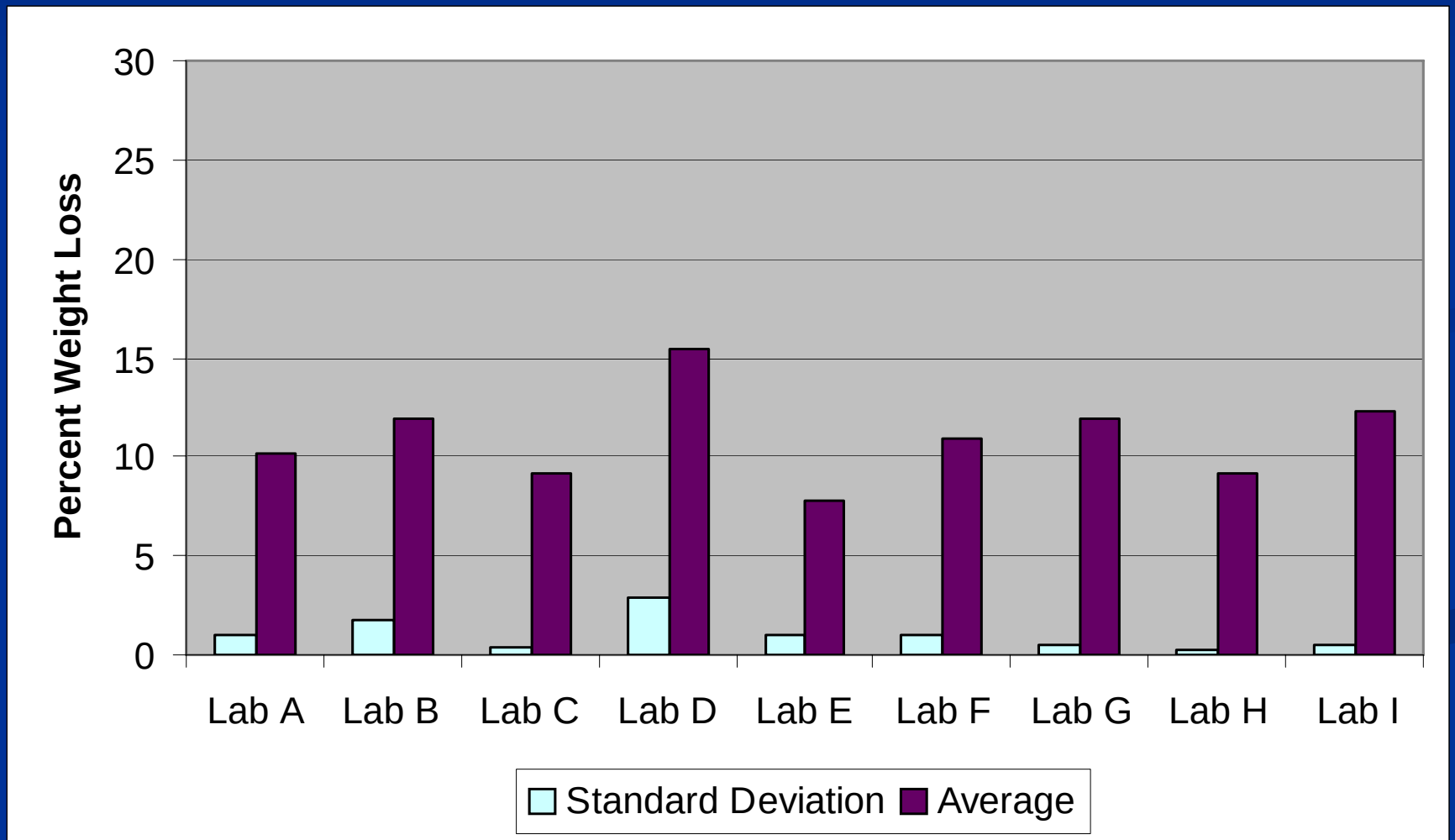
Fire Blocking Layer



Aircraft Seats

World Wide Round Robin Testing

Fire Hardened Foam 2



Aircraft Seats
World Wide Round Robin Testing

- There is no correlation in the pass/fail data among those labs that run according to the Rule or Handbook.
- All of the failures reported by all of the labs were due to weight loss. No failures were due to burn length.
- The majority of labs recorded greater horizontal bottom burn lengths than horizontal top burn lengths.
- The air velocity through the burner may be one of the reasons that cause the rapid breaching of the hook and loop closures and blocking layer into the polyurethane foam, resulting in failures of those test samples.
- The use of tabs and or a static disk may influence test results.
- The thermocouple type used for calibration purposes appears to be the wrong type for this test.

Radiant Heat Panel Discussion

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Composite Sample Ventilation

Ventilation Slits:

2-inch

vs.

4-inch

Composite Sample "C"

After Flame Time

Polyimide Film Cover	Metallized Tedlar Film Cover
2-inch Slit	**2-inch Slit**
3 seconds	0 seconds
5 seconds	4 seconds
4-inch Slit	**4-inch Slit**
7 seconds	1 second
4 seconds	6 seconds

Composite Sample "A"

After Flame Time

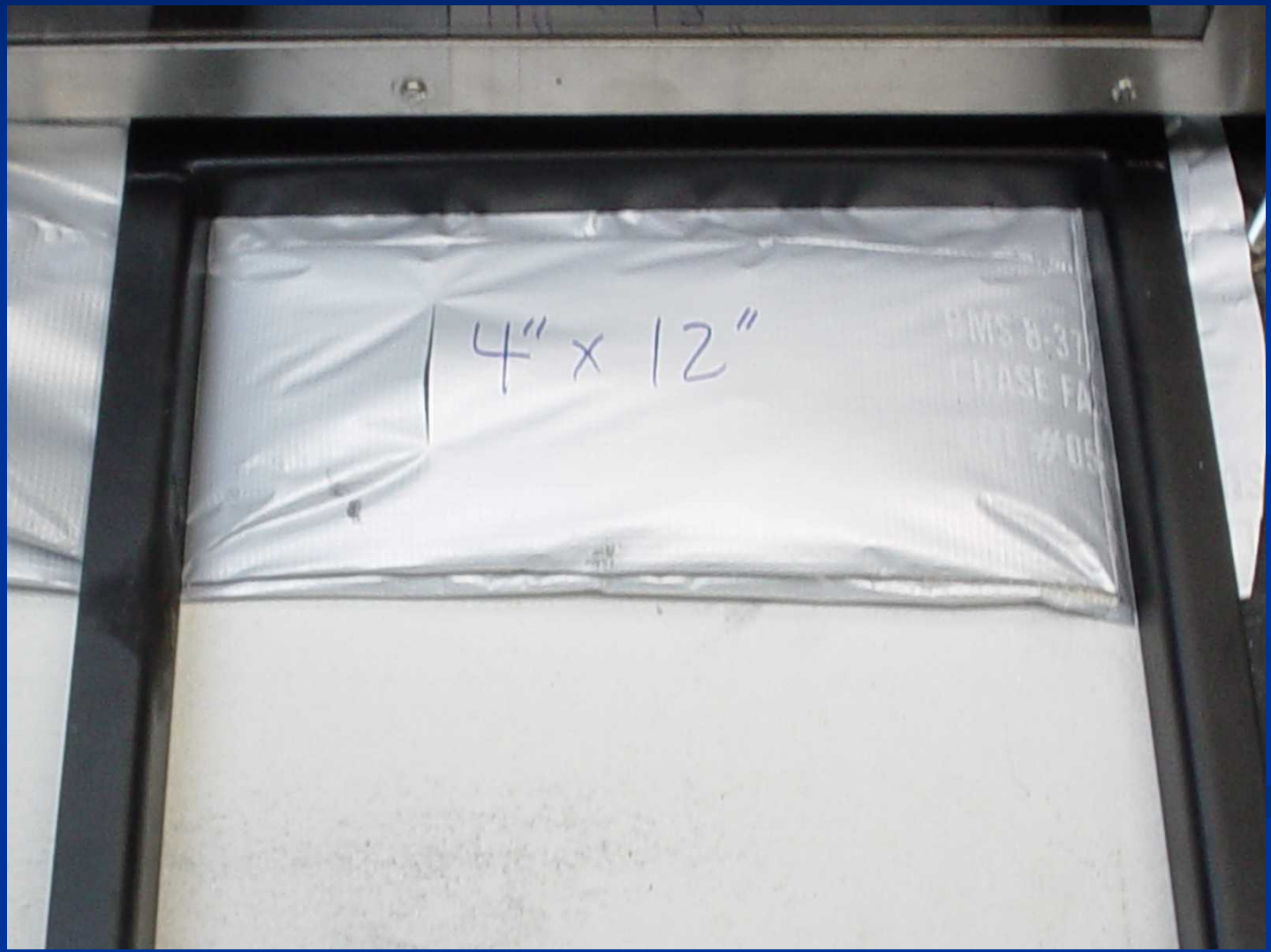
Polyimide Film Cover	Metallized Tedlar Film Cover
2-inch Slit	**2-inch Slit**
2 seconds	0 seconds
0 seconds	0 seconds
4-inch Slit	**4-inch Slit**
0 seconds	0 seconds
0 seconds	0 seconds

Hook and Loop

- Comparison testing of two different sample sizes.
- Testing performed at Aplix Inc., Charlotte, NC

Hook and Loop

4” x 12” Sample Before Test

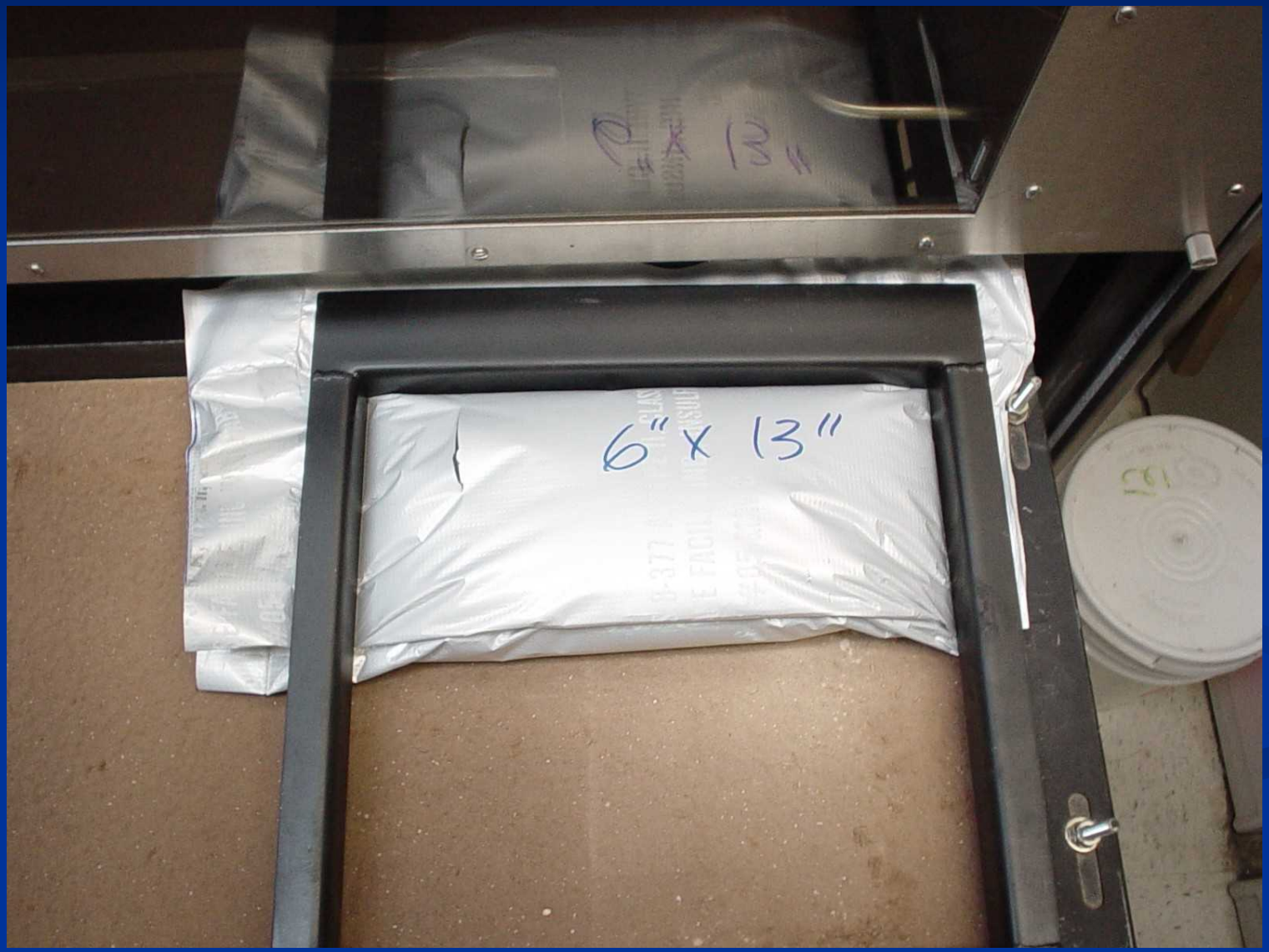


Hook and Loop

4” x 12” Samples After Test

Hook and Loop

6” x 13” Sample Before Test



Hook and Loop

6” x 13” Samples After Test

Hook and Loop

RHP Comparison Study
4" x 12" x 2" vs. 6" x 13" x 4" Hook and Loop Blankets

Test Method: 14 CFR 25.856 Appendix F Part 6
Preconditioning: 24 Hours at 72°F and 50% RH
Begin: 10/5/05 at 3:00 pm Ends: 10/6/05 at 4:00 pm

Heat Flux Calibration: 1.7
Recheck: 1.7

Chamber Temperature at Calibration: 509°F

Specimen	**Width** (Inches)	**Length** (Inches)	**Thickness** (Inches)		**After Flame** (Seconds) 3 Seconds Max.	**Flame Propagation** (From point of Flame Application) 2" Max.	**Pass/Fail**
1	4	12	2		1.8	0	PASS
2	4	12	2		0	0	PASS
3	4	12	2		0	0	PASS
1	6	13	4		0.9	0	PASS
2	6	13	4		0	0	PASS
3	6	13	4		0	0	PASS

Tested By: Jodie Wilson and Bobbie Williams

Discussion for Task Group

- Use of Flat Frame
- Flame Exposure Time (longer than 15 seconds)
- Temperature inside the chamber at calibration