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FIRE TECHNOLOGY DEPARTMENT
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FIRE PERFORMANCE EVALUATION OF OCEANSAFE H10-FPS/FPS, IN ACCORDANCE WITH UNDERWRITERS LABORATORIES (UL) 1715, STANDARD FOR FIRE TEST OF INTERIOR FINISH MATERIAL

FINAL REPORT
Consisting of 20 Pages

SwRI® Project No. 01.15216.01.207
Test Date: January 19, 2010
Report Date: February 8, 2010

Prepared for:
Oceansafe
3255 Bayshore Road
Greenport, NY 11944

Prepared by:

A blue ink signature of Chad Brewer, written over a large, stylized blue scribble.

DE
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INTRODUCTION

This report presents the results of a fire performance evaluation conducted in accordance with Underwriters Laboratories (UL) 1715, *Standard for Fire Test of Interior Finish Material* (1997), by Southwest Research Institute's (SwRI) Fire Technology Department, in San Antonio, TX.

This test method is intended to measure and describe the properties of materials or products in response to heat and flame under controlled laboratory conditions. The results should not be used alone to describe or appraise the fire hazard or the fire risk of materials, products, or assemblies under actual fire conditions. However, the results of this test may be used as elements of a complete fire hazard assessment or a fire risk assessment, which takes into account all the factors that are pertinent to an assessment of a material's end use.

UL 1715 does not have explicit acceptance criteria in terms of passing or failing the test. However, in Section 3 of the standard entitled *Performance*, there are two statements in the room corner scenario that evaluate the performance of the interior finish material, and they are as follows:

- During the test, the observed surface burning shall not extend to the extremities of the test specimen, nor shall flame project through the doorway opening at any time.
- At the conclusion of the test, observations shall show that the combustive damage (that is burning, charring, and the like) of the test materials within the panels diminishes at increasing distance from the immediate fire exposure area.

The material being tested may perform differently when it is placed in a room of a different size or shape, or in different environmental conditions. The test data cannot be generalized to apply to these different conditions. The results apply specifically to the specimens tested, in the manner tested, and not to similar materials, nor to the performance when used in combination with other materials.

The products of combustion and entrained air are collected in a hood and extracted through an exhaust duct by a fan. Smoke development is determined based on the measured light obscuration in the duct using a white-light extinction photometer, located approximately 15 ft from the plenum of the exhaust hood. A time history of the smoke development within the room is shown in Appendix A.

The test room is instrumented with thermocouples to measure the upper layer temperature in the room and above the wood crib at various heights. The thermocouple layout, as required by UL 1715, was used for this test. A time history of the temperature development within the room and at the doorway is shown in Appendix A.

UL 1715 (1997)

- Client:** Oceansafe
Project No.: 01.15216.01.207
Test Date: January 19, 2010
Material ID: *H10-FPS/FPS*
- Manufactured by: Advanced Insulation Concepts, Inc. of Florence, KY
- Trade Name:** Oceansafe
Material Description: Sandwich panel with a 10-in. EPS foam core and 0.020-in. Galvalume® steel (AZ-50) facings coated with primer. The EPS foam core is 1.5-pcf. The panels were selected and inspected by a representative of Farabaugh Engineering and Testing, Inc., on December 3, 2009 (See Appendix B for documentation.).
- Construction Details:** The module was constructed using two lengths of *H10-FPS/FPS* (8 ft for the walls and 10 ft for the ceiling)
- 1.) 10-1/8-in. Open C Track was installed onto the deck to receive the vertical 8-ft wall panels.
 - 2.) The 8-ft panels were placed on end and pressed together via interlocking channels (See Figure 9.).
 - 3.) This was repeated until all panels were snap fit together.
 - 4.) The test corner was created by two panels cut at 45°, creating the 90° test corner.
 - 5.) The external test corner was capped with a 3 × 10-in. galvanized steel angle, while the internal test corner was covered by a 3 × 3-in. galvanized steel angle.
 - 6.) The gap in the test corner where the two walls were joined, was filled with an insulating single-component polyurethane foam sealant (See Figure 10.).
 - 7.) 10-1/8-in. Open C Track was installed on top of the test walls.
 - 8.) Once the test walls were erected, the 10-ft ceiling panels were then set across the span of the module, snap fit together, and secured to the wall panels via Truefast 13¾ in. SIPHD-13750 screws.
 - 9.) 1½-in. furring channels were installed to the inside of the test walls and ceiling, spaced every 24 in.
 - 10.) Once the furring channels were in place, one layer of regular ½-in. thick regular gypsum wallboard was fastened to the interior of the test walls and ceiling (see Figure 11). The nominal finished interior dimensions of this module are 8 × 12 × 8 ft high. Both test walls and ceiling screw patterns were 8 in. on center.

Table 1. Material Description.

Material ID	Dimensions (l)×(w) (nominal in.)	Thickness (nominal in.)	Color	Weight (nominal lb)
<i>H10-FPS/FPS</i>	5 Panels at 96 × 48	10	Green with White Core	92.9
	3 Panels at 120 × 48			116.8

The test room and building were maintained at approximately 71 °F and 70% relative humidity prior to the start of the test. A material description is given in Table 1, a summary of the test results is given in Table 2, and visual observations can be found in Table 3. Selected photographic documentation is provided in Figures 1 through 11. The test results are summarized in Appendix A with the third party inspections provided in Appendix B.

Table 2. Summary of Test Results.

Material ID	Burning to Outer Extremities or Flame through Doorway?	Diminishing Combustive Damage with Distance from Burn Corner?
<i>H10-FPS/FPS</i>	No	Yes

Based on the test results, the material identified as *H10-FPS/FPS*, does comply with the statements in the *Performance* section of UL 1715 because surface burning did not extend to the extremities of the test specimen, and charring did diminish from the test corner to the outer extremities of the test walls and ceiling. Post-test investigation revealed no melting of the EPS on the ceiling and only minimal melting of the EPS on the back and right side test walls (See Figures 7 and 8.).

Table 3. Visual Observations.

Time (min:s)	Observation
00:00	Ignition of the excelsior under the crib.
00:03	Flames are up to 3 ft above the floor.
00:05	Flames are up to 4½ ft above the floor.
00:08	Flames are up to 6 ft above the floor.
00:14	Flames are up to 5½ ft above the floor.
00:22	Light white smoke down to 5½ ft above the floor.
00:30	Light discoloration radius of 3 in. between 2 and 3 ft.
00:40	Light discoloration radius of 4 in. at 2 ft and tapering to a 2 in. radius at 4¾ ft above the floor in the crib corner.
00:55	Flames up to 6 ft above the floor in the crib corner.
00:59	Charring and discoloration radius of 5 in. at 2 ft, tapering to a 3-in. radius at 5 ft above the floor in the crib corner.
01:10	Light brown smoke down to 5 ft above the floor.
01:50	Flames intermittent to the ceiling.
01:55	Light discoloration radius of 3 in. on the ceiling directly above the crib.
02:24	Light discoloration radius of 10 in. on the ceiling directly above the crib.
02:34	Charring and discoloration radius of 10 in. between 2 and 4 ft, tapering to a 6 in. radius at 7 ft above the floor in the crib corner.
02:53	Charring and discoloration radius of 12 in. on the ceiling directly above the crib.
03:10	Charring and discoloration radius of 18 in. on the ceiling directly above the crib.
03:40	Charring and discoloration radius of 14 in. between 2 and 4 ft, tapering to an 8-in. radius at 7 ft above the floor in the crib corner.
04:00	Light brown smoke at 5 ft above the floor.
05:31	Charring and discoloration radius of 26 in. on the ceiling directly above the crib.
06:00	Flames consistent to 7 and 8 ft. Flames flashing along the wall/ceiling junction out to 2 ft in either direction.
06:15	Located at the exterior burn corner wall/ceiling junction, there is a small amount of smoke being emitted.
07:00	No significant change.
09:00	No significant change.
11:00	Exterior burn corner is cold to touch on the side test wall and back test wall. Flames flashing along the wall/ceiling junction out to 3 ft in either direction.
12:30	Light brown smoke remains at 5 ft above the floor.
15:00	End of Test. Crib extinguished. Fire extinguished.

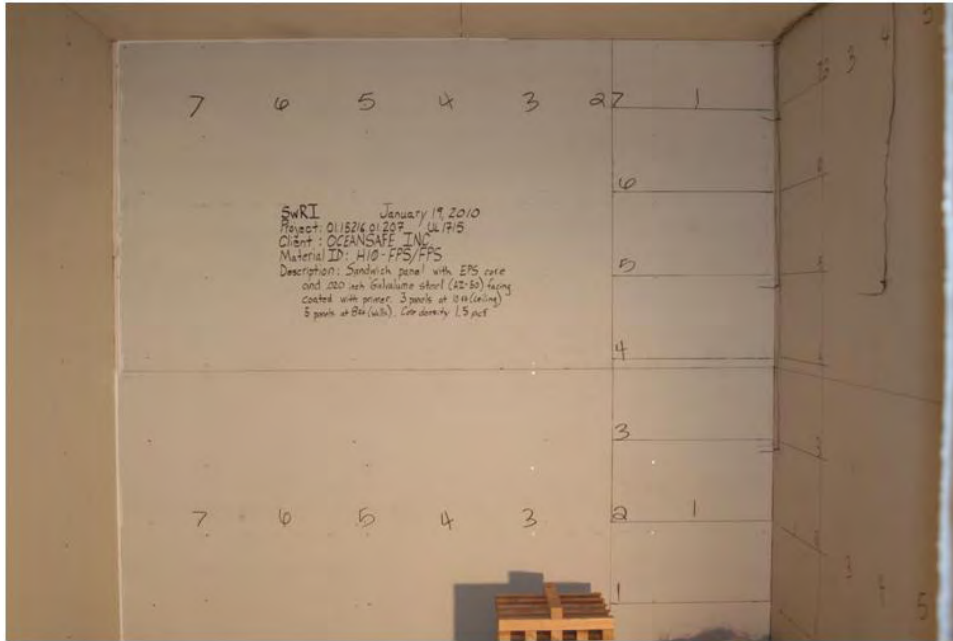


Figure 1. Completed Test Room.



Figure 2. 3 min 1 s into Test.



Figure 3. 14 min 26 s into Test.

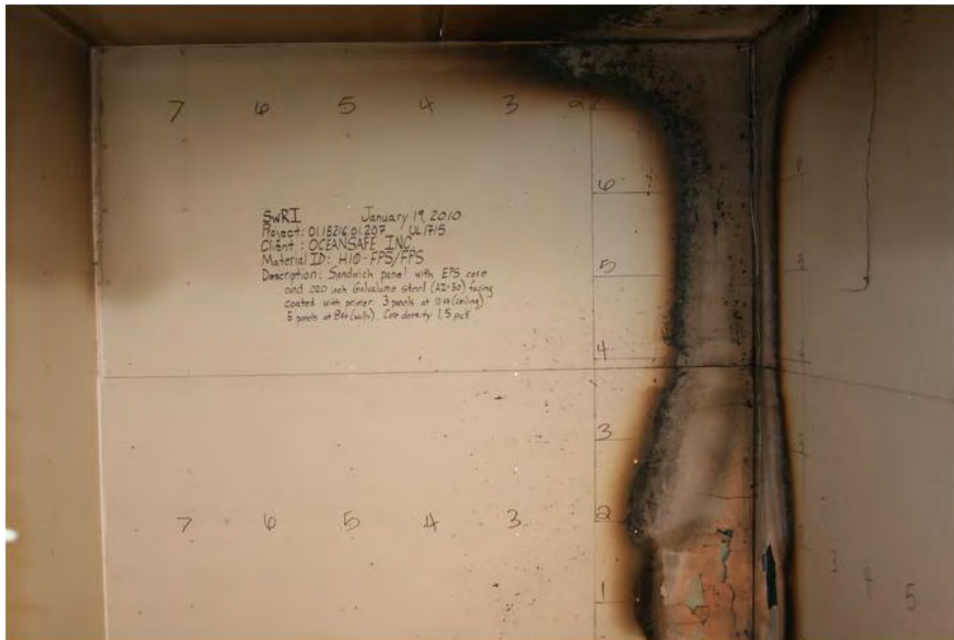


Figure 4. Post-Test View No. 1 of Burn Corner with Gypsum.



Figure 5. Post-Test View without Gypsum.



Figure 6. Post-Test View without Metal Sheeting.



**Figure 7. Back Wall: Post-Test View without Metal Sheeting.
Nominal 1 3/8-in. Melting Depth at Crib Corner.**



**Figure 8. Right Wall: Post-Test View without Metal Sheeting.
Nominal 2 3/4-in. Melting Depth at Crib Corner.**



Figure 9. Open C Channel and Test Wall Construction.



Figure 10. Single-Component Polyurethane Foam Sealant.

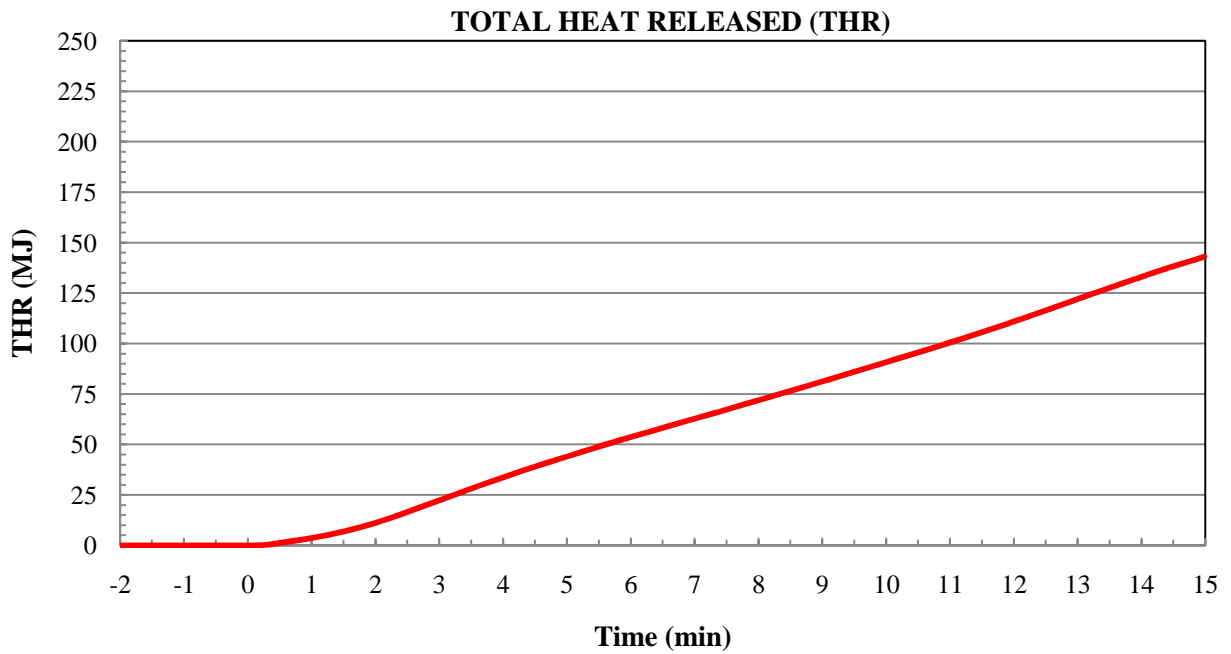
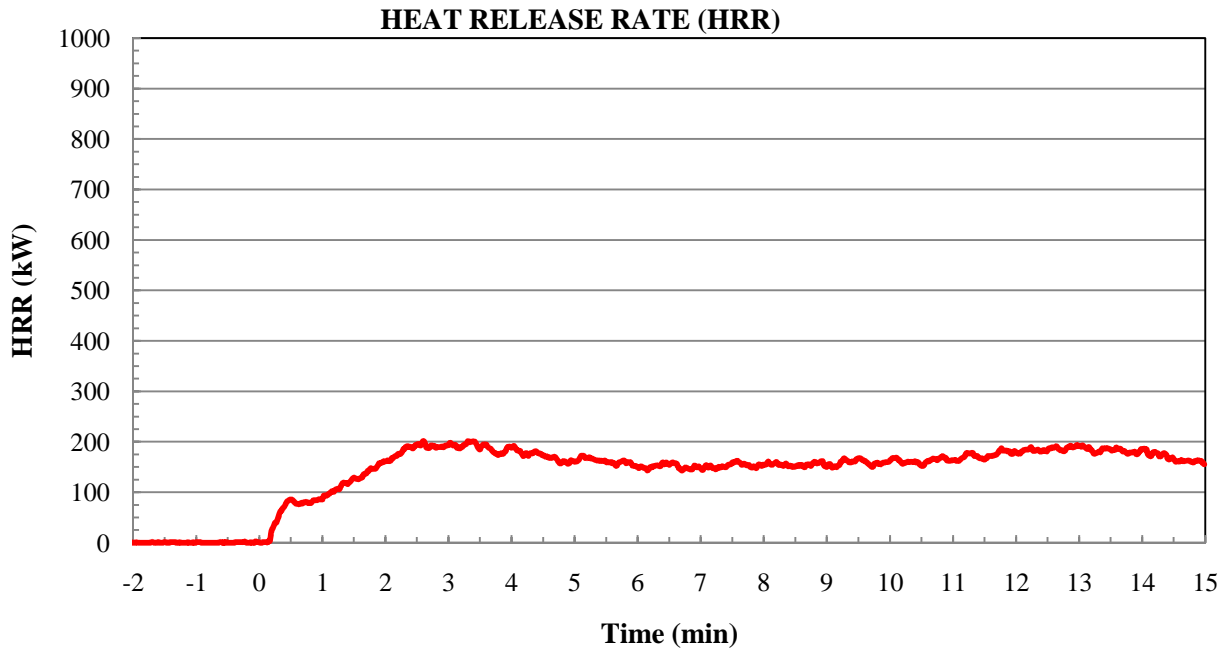


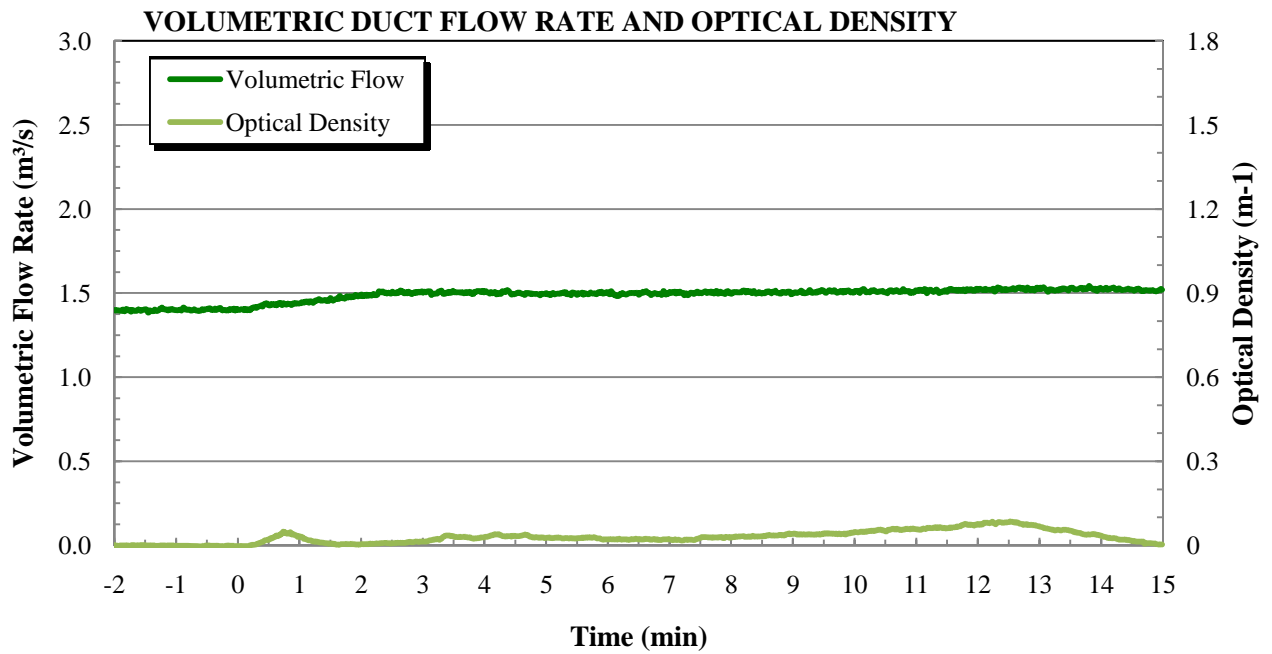
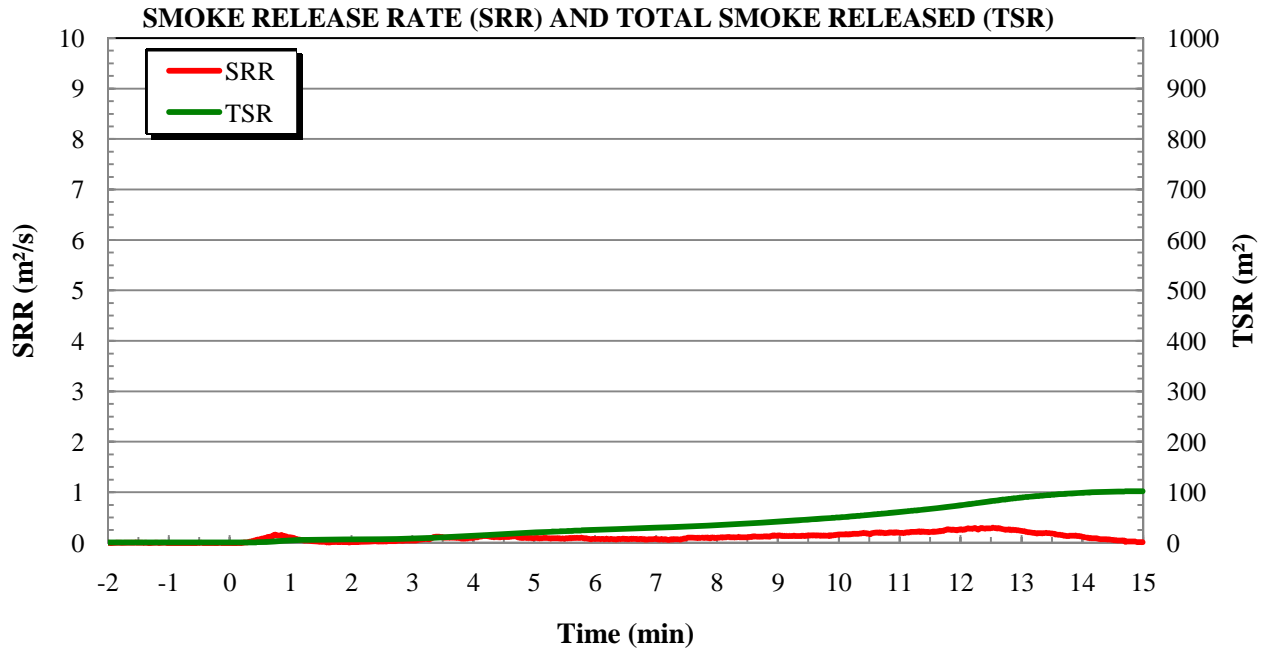
Figure 11. Walls with 1½-in. Furring Strips and Regular ½-in. Thick Gypsum Lining the Interior.

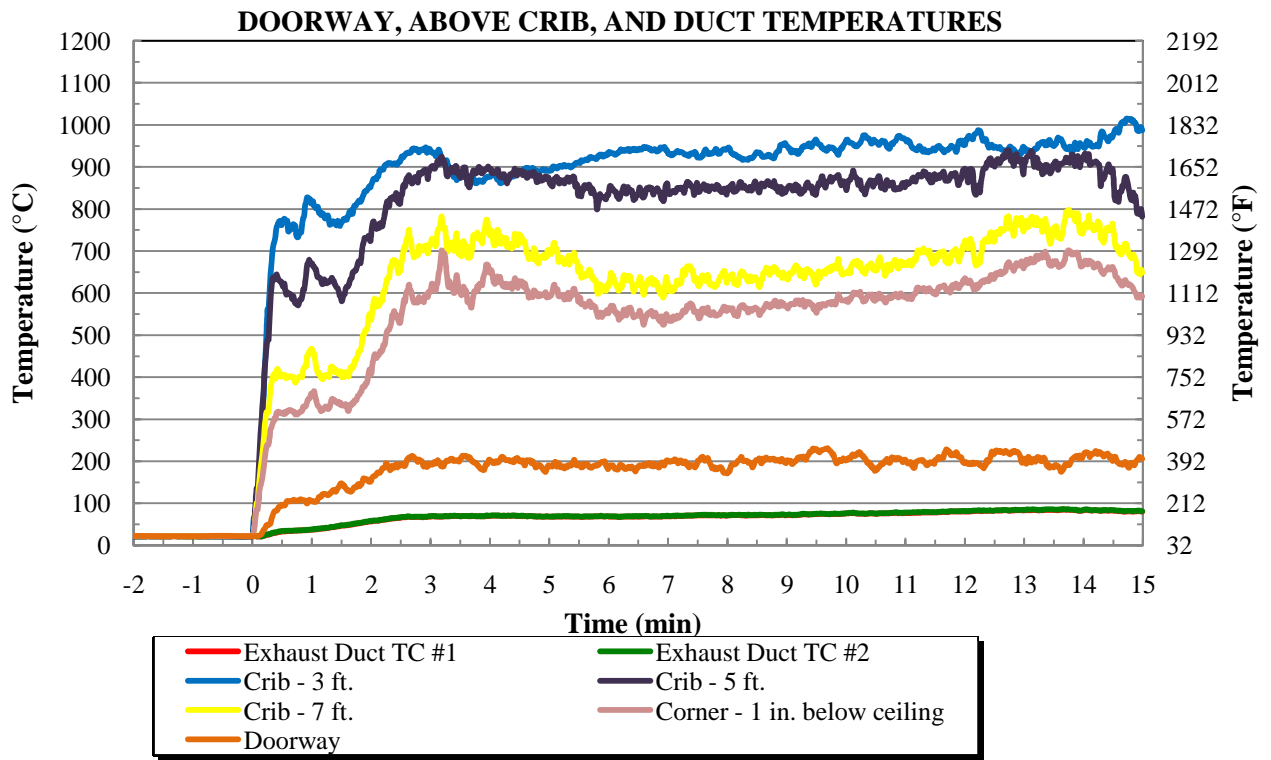
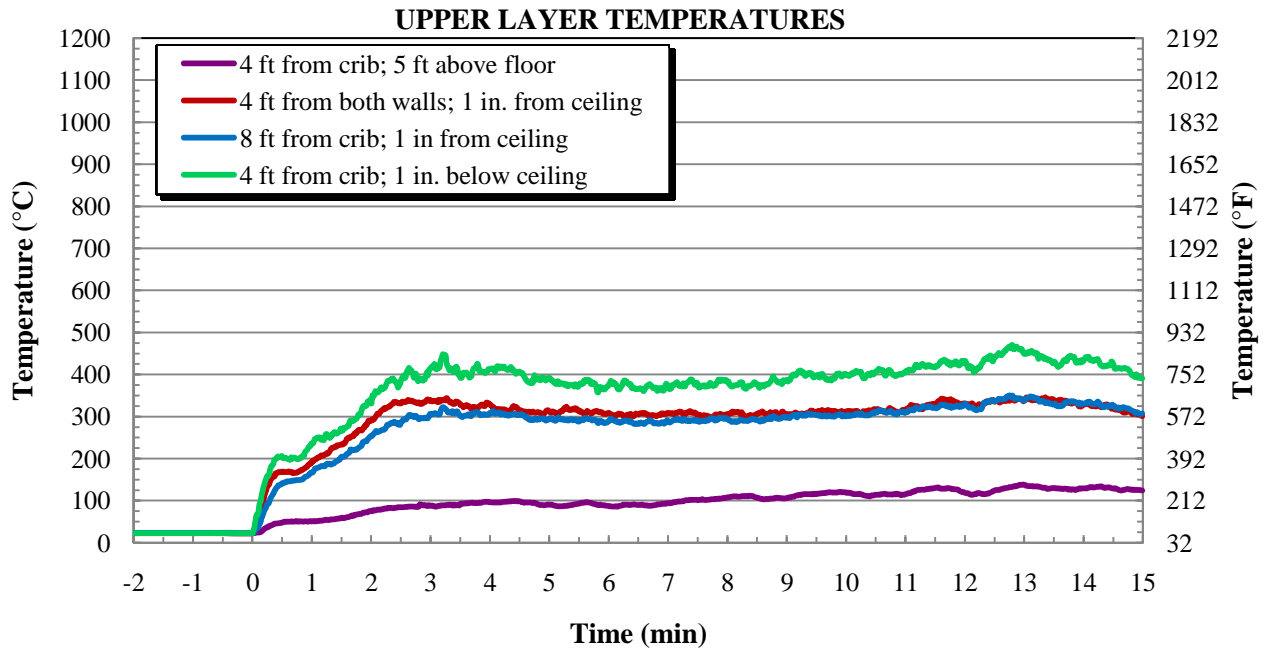
APPENDIX A
TEST DATA
(Consisting of 4 Pages)

**SUMMARY OF
TEST RESULTS**

Maximum HRR _{total}	202 kW	at 2:36
Average HRR _{total}	159 kW	
Total Heat Released	143 MJ	
Maximum Smoke Release Rate	0.30 m ² /s	at 12:31
Average Smoke Release Rate	0.11 m ² /s	
Total Smoke Released	102 m ²	
Maximum Optical Density	0.085 l/m	at 12:31
Maximum Duct Flow Rate	1.54 m ³ /s	at 13:48
Average Optical Density	0.033 l/m	
Average Volumetric Duct Flow Rate	1.50 m ³ /s	







APPENDIX B
THIRD-PARTY WITNESS
(Consisting of 3 Pages)



Farabaugh Engineering and Testing Inc.

TEST SAMPLE IDENTIFICATION SHEET

Date: 12-3-09

FARABAUGH ENGINEERING & TESTING, INC.

Sampling Inspector and Employer: PAUL MEDWIG

Manufacturer: ADVANCED INSULATION CONCEPTS, INC.

Manufacturing Location: BOSS PRODUCTION AVENUE FLORENCE, KY 41042-3094

Specimen Description: H10-FPS/FPS (8' FOAM PANELS)

Specimen Lot No(s) : FS971, FS972, FS973, FS974, FS975

Date of Manufacture: 12-3-09

Pretreatment or Curing Requirements: NONE

RUN #8615 (FOAM #10254), (TOP COIL #575584, BOTTOM COIL #607327)

Deviations, Additions, or Exclusions:

NONE

Environmental Conditions that may affect the samples or sampling.

NONE

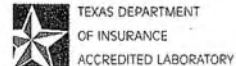
Manufacturer's Representative: DAVID DEMING

Signature: [Handwritten Signature]

Sampling Inspector: PAUL MEDWIG

Signature: [Handwritten Signature]

IAS ACCREDITED INSPECTION AGENCY AA-715 FET-D-101 (10/2/06)



401 Wide Drive, McKeesport, PA 15135 (412) 751-4001 FAX (412) 751-4003 WWW.FETLABS.COM



Farabaugh Engineering and Testing Inc.

TEST SAMPLE IDENTIFICATION SHEET

Date: 12-3-09

Sampling Inspector and Employer: PAUL MEDWIG FARABAUGH ENGINEERING & TESTING, INC.

Manufacturer: ADVANCED INSULATION CONCEPTS INC.

Manufacturing Location: 8055 PRODUCTION AVENUE FLORENCE, KY 41042-3094

Specimen Description: H10-FPS/FPS (10' FOAM PANELS)

Specimen Lot No(s): FS968, FS969, FS970

Date of Manufacture: 12-3-09

Pretreatment or Curing Requirements: NONE

RUN # 8615 (FOAM # 10254), (TOP COIL # 575584, BOTTOM COIL # 607827)

Deviations, Additions, or Exclusions:

NONE

Environmental Conditions that may affect the samples or sampling:

NONE

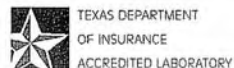
Manufacturer's Representative: DAVID DEMING

Signature: [Signature]

Sampling Inspector: PAUL MEDWIG

Signature: [Signature]

IAS ACCREDITED INSPECTION AGENCY AA-715 FET-D-101 (10/2/06)



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Farabaugh Engineering and Testing Inc.

TEST SAMPLE IDENTIFICATION SHEET

Date: 12-3-09

FARABAUGH ENGINEERING & TESTING, INC.

Sampling Inspector and Employer: PAUL MEDWIG

Manufacturer: ADVANCED INSULATION CONCEPTS, INC.

Manufacturing Location: BOSS PRODUCTIONS AVENUE FLORENCE, KY 41042-3094

Specimen Description: H10-FPS / FPS (10' FORM PANEL)

Specimen Lot No(s) : FS 977

Date of Manufacture: 12-3-09

Pretreatment or Curing Requirements: NONE

ROW # 8615 (FOAM # 10254), (TOP COIL # 575584, BOTTOM COIL # 607327)

Deviations, Additions, or Exclusions:

NONE

Environmental Conditions that may affect the samples or sampling. NONE

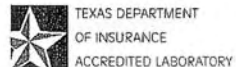
Manufacturer's Representative: DAVID DEMING

Signature: [Signature]

Sampling Inspector: PAUL MEDWIG

Signature: [Signature]

IAS INSPECTION AGENCY AA-715 FET-D-101 (10/2/06)



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