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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
FIRE TECHNOLOGY DEPARTMENT
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FAX (210) 522-3377

October 11, 2007



Mr. Locke Wilde
Jacaranda Inc.
16301 NW 15th Avenue
Miami, FL 33169

Subject: SwRI Project No. 01.12703.01.233

Dear Mr. Wilde:

Enclosed please find the final report for the above-referenced project, along with photographic and video documentation. If you have any questions or if I can be of further assistance, please feel free to contact me by phone at (210) 522-5469, or by e-mail at David.Ewan@swri.org. Alternatively, you may contact Anthony Saucedo by phone at (210) 522-3718, or by email at Anthony.Saucedo@swri.org. We can be reached by fax at (210) 522-3377.

Sincerely,

David Ewan
Engineer
Material Flammability Section

DE/ltr

Enclosures: 1) Report
2) 1 Photo CD
3) 1 VHS

cc: Record Copy A (FTD))
)



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FIRE PERFORMANCE EVALUATION OF WOOD VENEER WALLCOVERING, IN ACCORDANCE WITH THE 2006 EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION 286, *STANDARD METHODS OF FIRE TESTS FOR EVALUATING CONTRIBUTION OF WALL AND CEILING INTERIOR FINISH TO ROOM FIRE GROWTH*

TRADE NAME: SANFOOT

FINAL REPORT
Consisting of 19 Pages

SwRI Project No. 01.12703.01.233
Test Date: September 14, 2007
Report Date: October 11, 2007

Prepared for:

Jacaranda Inc.
16301 NW 15th Avenue
Miami, FL 33169

Prepared by:

A handwritten signature in blue ink that reads "David Ewan".

David Ewan
Engineer
Material Flammability Section

Approved by:

A handwritten signature in blue ink that reads "Gladys M. Miller".

Gladys M. Miller, M.S., M.B.A.
Assistant Director
Fire Technology Department

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ABSTRACT

This report presents the results of a fire performance evaluation of *Wood Veneer Wallcovering*, 0.01-in. thick flexible wood veneer wall covering with a urethane finish, for Jacaranda Inc., located in Miami, FL. Testing was conducted in accordance with the 2006 Edition of National Fire Protection Association (NFPA) Standard 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*. Testing was conducted on September 14, 2007, by Southwest Research Institute's (SwRI) Fire Technology Department, located in San Antonio, TX.

NFPA 286 does not have criteria for passing or failing a product due to performance during the fire test. In general, this test is used as a tool for ranking material performance in a standard configuration. However, a major event that this test can identify is the propensity of a material to cause a standard room to “flashover”, which according to NFPA 286, is determined to have occurred when two of five specified conditions are attained. 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.

A summary of the test results obtained for *Wood Veneer Wallcovering* is given in the table below.

Summary of Test Results and Flashover Limits.

Material ID	Maximum Heat Release Rate (Total)	Total Heat Flux to the Floor	Maximum Average Upper Layer Temperature	Flames Exiting Doorway?	Auto-Ignition of Paper Target?
<i>Wood Veneer Wallcovering</i>	321 kW	3.9 kW/m ²	429 ° C	No	No
Flashover Limits Per Section 1.3.11 of NFPA 286	1000 kW	20 kW/m ²	600 ° C	Not Allowed	Not Allowed

Based on the test results, the material identified as *Wood Veneer Wallcovering*, **did not** cause the test room to flashover. The Client's material meets the acceptance criteria for interior wall or ceiling finishes as described in the 2006 International Building Code.

1.0 INTRODUCTION

This report presents the results of a fire performance evaluation of *Wood Veneer Wallcovering*, 0.01-in. thick flexible wood veneer wall covering with a urethane finish, for Jacaranda Inc., located in Miami, FL. Testing was conducted in accordance with the 2006 Edition of National Fire Protection Association (NFPA) Standard 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*. Testing was conducted on September 14, by Southwest Research Institute's (SwRI) Fire Technology Department, located in San Antonio, TX.

2.0 OBJECTIVE

This test method is intended for the evaluation of the flammability characteristics of wall and ceiling interior finish, other than textile wall coverings, where such materials constitute the exposed interior surfaces of buildings. It determines how much a material will contribute to a fire by measuring the amount of heat and smoke released, along with the combustion products released.

NFPA 286 does not have criteria for passing or failing a product due to performance during the fire test. In general, this test is used as a tool for ranking material performance in a standard configuration. However, a major event that this test can identify is the propensity of a material to cause a standard room to "flashover", which according to NFPA 286, is determined to have occurred when two of five specified conditions are attained. 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.

3.0 TEST ASSEMBLY

Jacaranda Inc. provided the material, identified as *Wood Veneer Wallcovering*, for testing in accordance with NFPA 286. Thirty sheets of material, measuring $36\frac{1}{2} \times 108\frac{1}{2}$ -in. each, were received on August 24, 2007. The *Wood Veneer Wallcovering* material weighed 8.6 oz/sq yd. Representatives of SwRI adhered the material to $\frac{1}{2}$ -in. thick gypsum wallboard using Zinsser Sure Grip Heavy Duty Clay 138 adhesive on August 30, 2007. One five-gal container of the adhesive was received on August 29, 2007, from Jacaranda Inc. The material, with Trade Name *SanFoot* consisted of a 0.01-in. thick flexible wood veneer wall covering with a urethane finish. The samples were maintained at a temperature of $70 \text{ }^\circ\text{F} \pm 3 \text{ }^\circ\text{F}$ until the day of testing.

The 8 × 8-ft back wall, 8 × 12-ft sidewalls, and 8 × 12-ft ceiling of the test room were covered with the *Wood Veneer Wallcovering* and ½-in. gypsum wallboard panels. The panels were mechanically fastened to the test walls using screws every 6 in. on center around the perimeter and every 12 in. on center up the middle. See Figure B-1 for a picture of the completed assembly.

4.0 INSTRUMENTATION

The heat release rate (HRR) is measured using the oxygen consumption technique. This technique requires the measurement of gas concentrations in the exhaust duct, as well as the volumetric flow of these gases. The products of combustion and entrained air are collected in a hood and extracted through an exhaust duct by a fan. A gas sample is drawn from the exhaust duct and analyzed for oxygen, carbon dioxide, and carbon monoxide concentrations. The gas temperature and differential pressure across a bi-directional probe are measured for calculating the mass flow rate of the exhaust gases.

Smoke release rate (SRR) is determined based on the measured light obscuration in the exhaust duct using a vertically-oriented white-light extinction photometer located close to the gas sampling point. Temperature measurements were recorded using thermocouples positioned according to NFPA 286.

5.0 TEST RESULTS

Testing was conducted by SwRI’s Fire Technology Department on September 14, 2007. The test room and building were at approximately 76 °F and 59% relative humidity during the test. The test results are summarized in Appendix A. Selected photographic documentation is provided in Appendix B, and visual observations can be found in Appendix C. A summary of the test results is given in Table 1 below.

Table 1. Summary of Test Results and Flashover Limits.

Material ID	Maximum Heat Release Rate (Total)	Total Heat Flux to the Floor	Maximum Average Upper Layer Temperature	Flames Exiting Doorway?	Auto-Ignition of Paper Target?
<i>Wood Veneer Wallcovering</i>	321 kW	3.9 kW/m ²	429 ° C	No	No
Flashover Limits Per Section 1.3.11 of NFPA 286	1000 kW	20 kW/m ²	600 ° C	Not Allowed	Not Allowed

The 2006 International Building Code (IBC) has acceptance criteria for interior wall or ceiling finishes tested in accordance with NFPA 286. The criteria as contained in the 2006 IBC, Section 803.2, is as follows:

1. During the 40-kW exposure, flames shall not spread to the ceiling.
2. During the 160-kW exposure, the interior finish shall comply with the following:
 - a. Flame shall not spread to the outer extremity of the sample on any wall or ceiling.
 - b. Flashover, as defined in NFPA 286, shall not occur.
3. The peak rate of heat release throughout the NFPA 286 test shall not exceed 800 kW.
4. The total smoke released throughout the NFPA 286 test shall not exceed 1000 m².

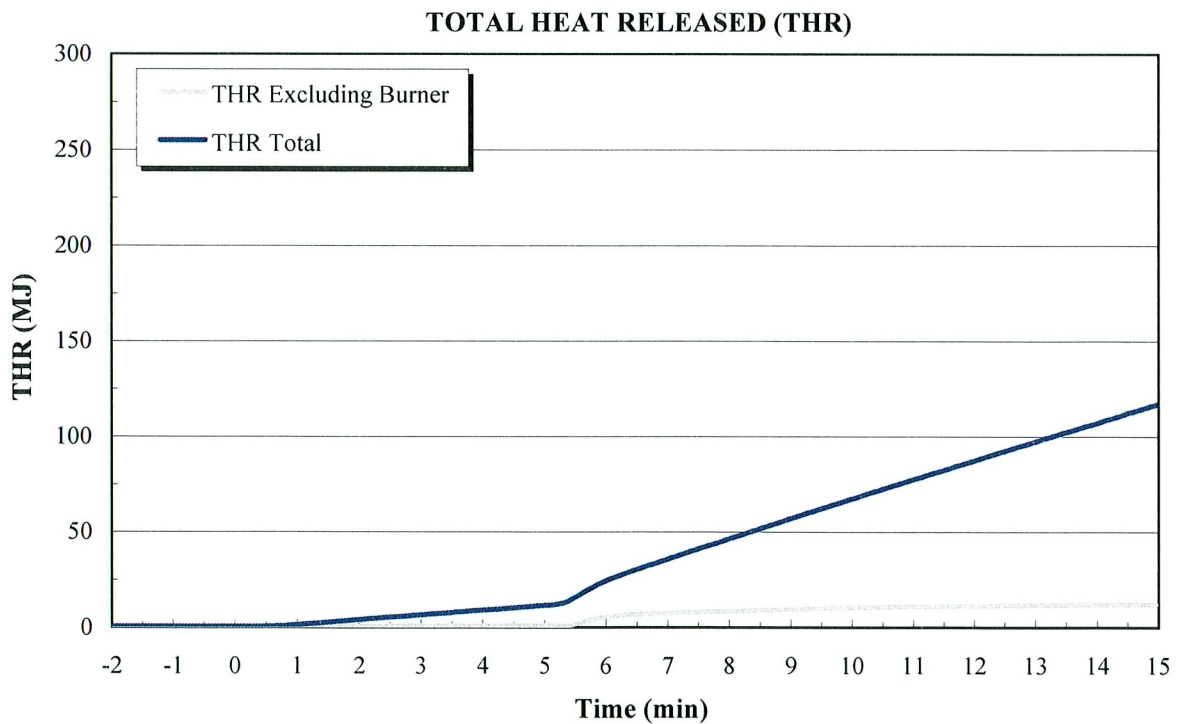
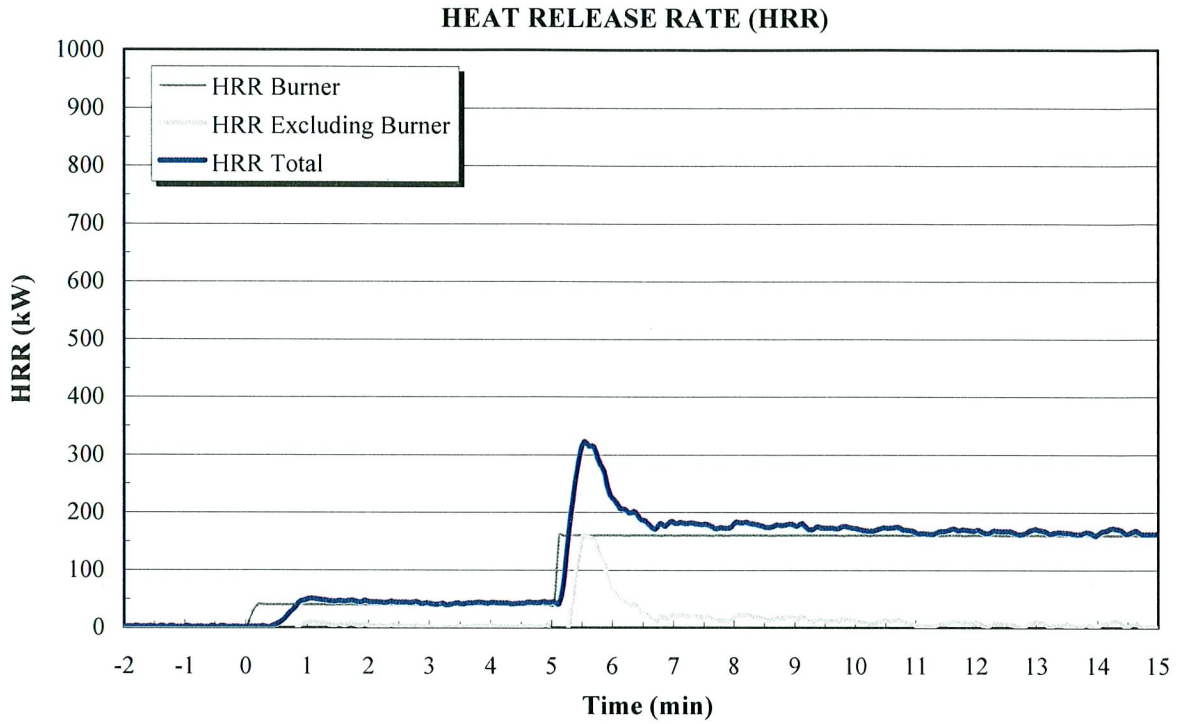
6.0 CONCLUSION

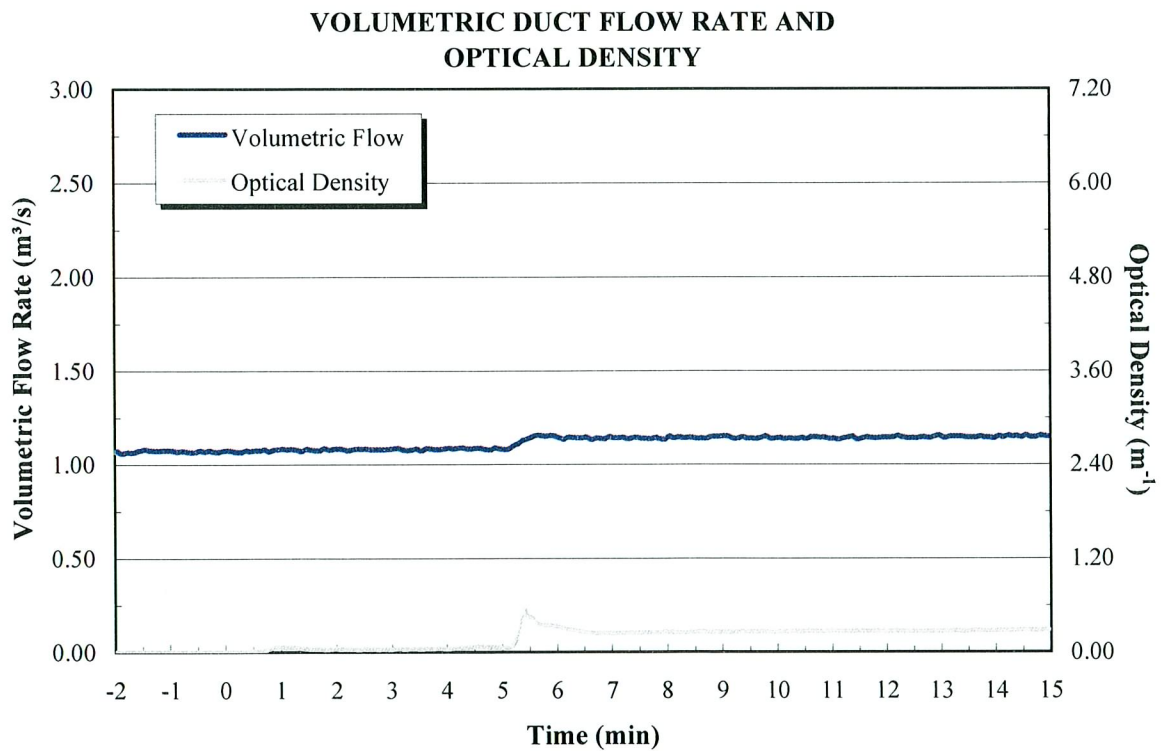
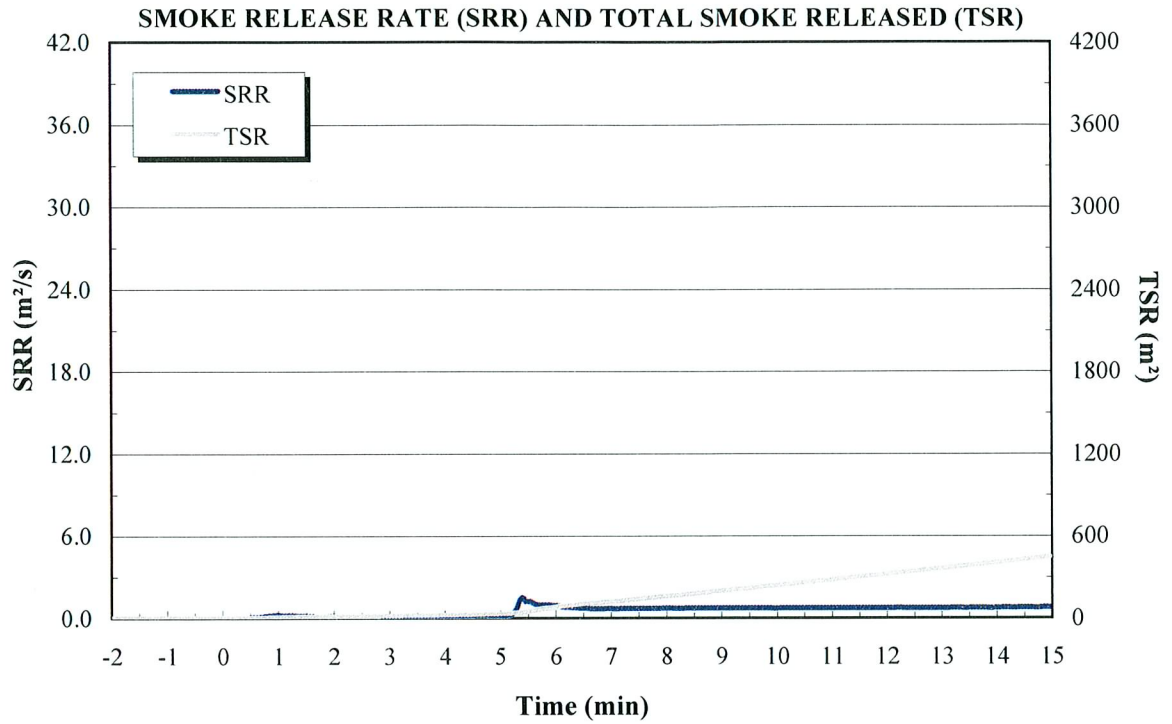
Based on the test results, the material identified as *Wood Veneer Wallcovering*, **did not** cause the test room to flashover. The Client's material meets the acceptance criteria for interior wall or ceiling finishes as described in the 2006 IBC.

APPENDIX A
TEST DATA
(Consisting of 5 Pages)

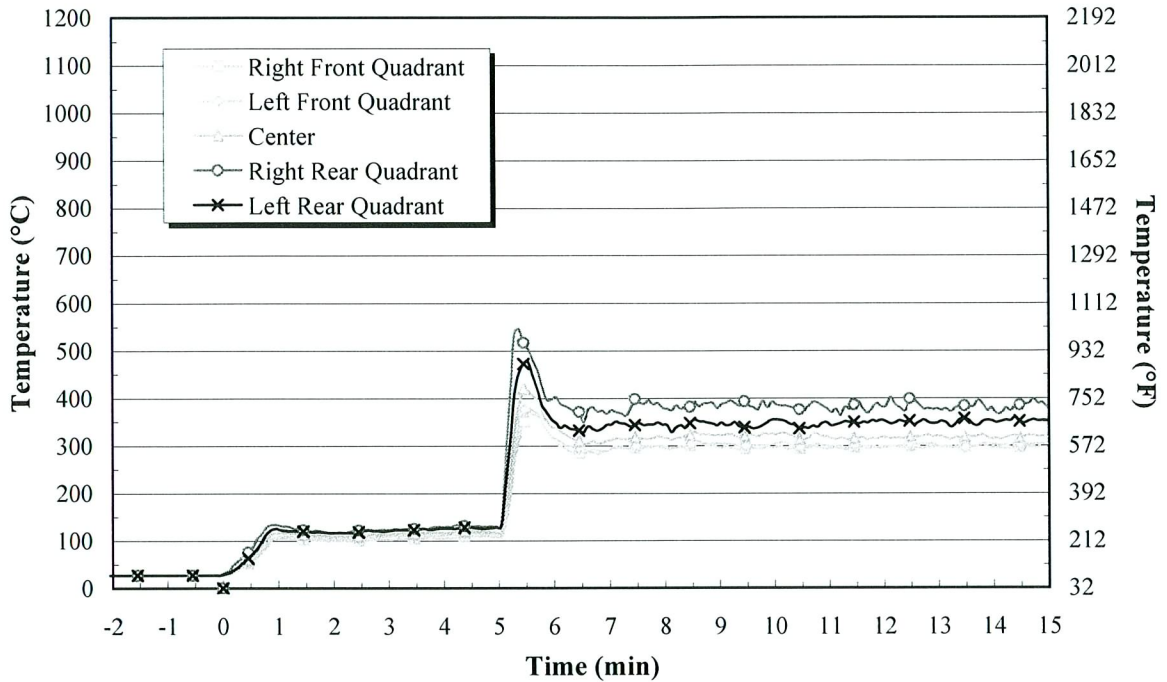
**SUMMARY OF
 TEST RESULTS**

Maximum HRR _{total}	321 kW	at	5 min 32 sec
Average HRR _{total}	130 kW		
Total Heat Released	117 MJ		
Maximum HRR _{excl. burner}	161 kW	at	5 min 32 sec
Average HRR _{excl. burner}	14 kW		
Total Heat Released (Excluding Burner)	12 MJ		
Maximum Smoke Release Rate	1.43 m ² /s	at	5 min 22 sec
Average Smoke Release Rate	0.50 m ² /s		
Total Smoke Released	447 m ²		
Maximum Optical Density	0.55 1/m	at	5 min 22 sec
Maximum Duct Flow Rate	1.13 m ³ /s		
Average Optical Density	0.191 1/m		
Average Volumetric Duct Flow Rate	1.12 m ³ /s		
Total Heat Flux to the Floor	3.9 kW/m ²	at	5 min 17 sec
Max. Average Upper Layer Temperature	429°C 804°F	at	5 min 32 sec
Maximum Doorway Temperature	309°C 588°F	at	5 min 37 sec

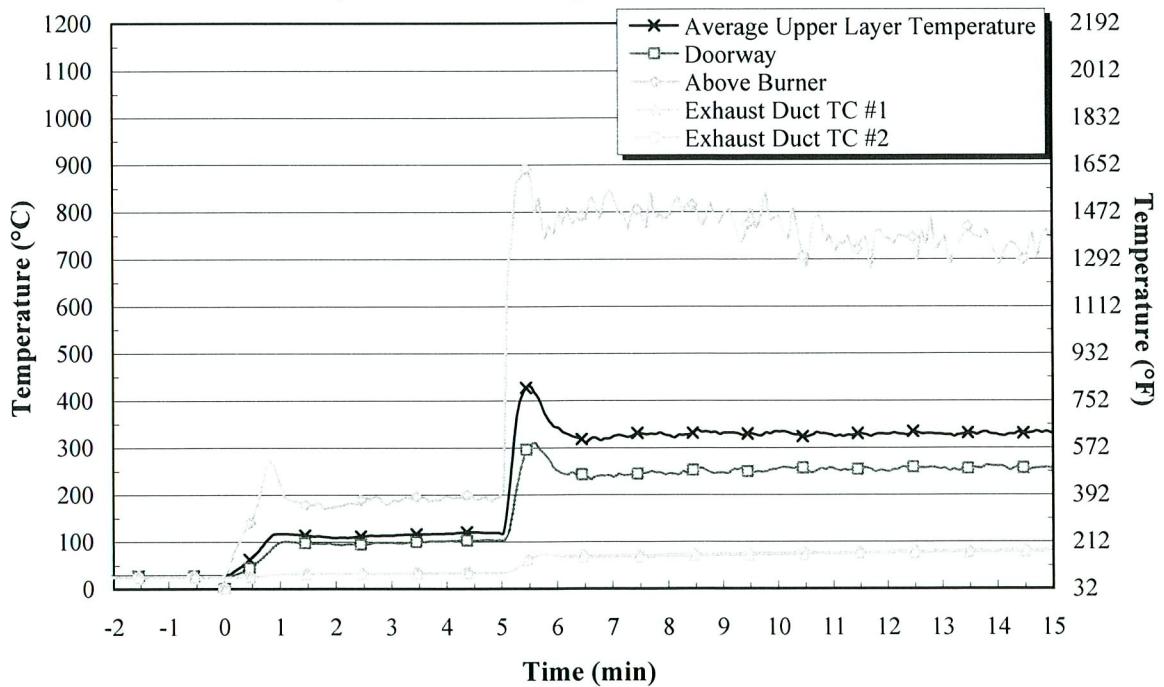


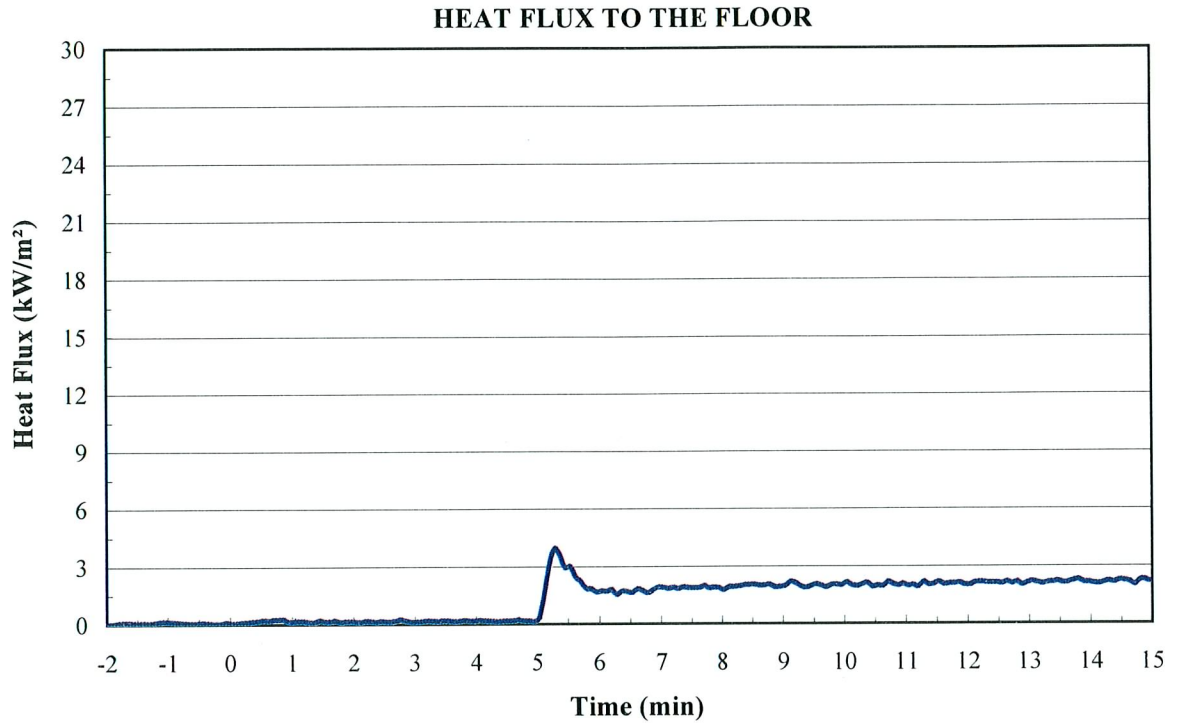


UPPER LAYER TEMPERATURES



DOORWAY, ABOVE BURNER, AND DUCT TEMPERATURES





APPENDIX B
PHOTOGRAPHIC DOCUMENTATION
(Consisting of 5 Pages)

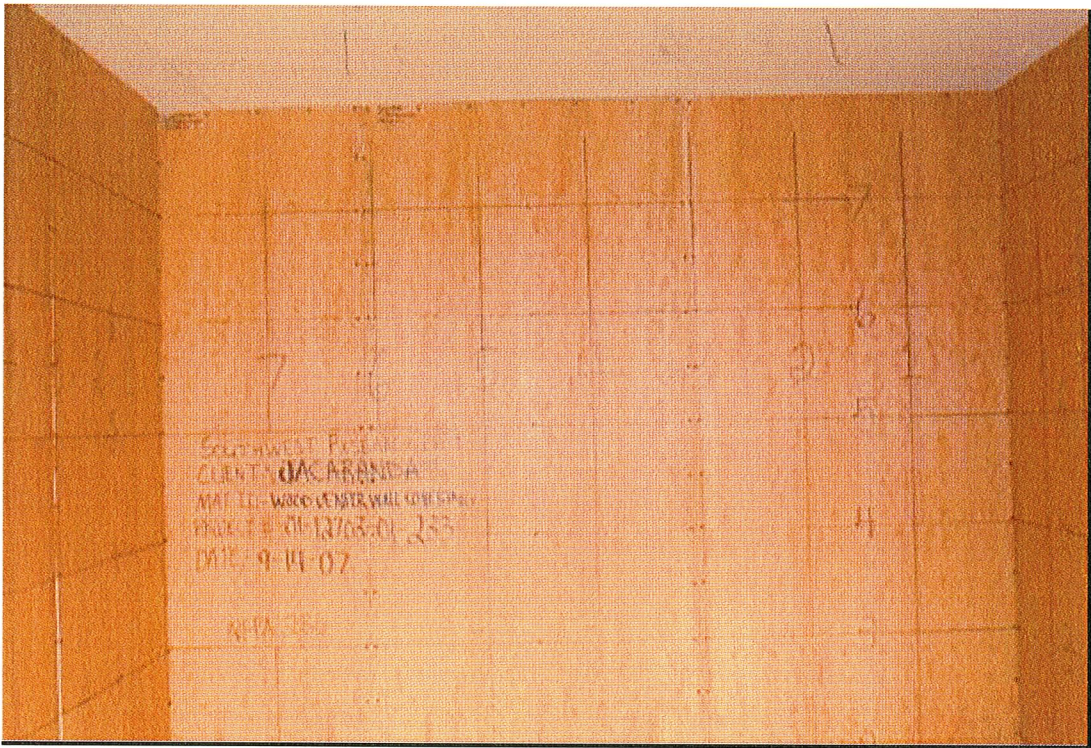


Figure B-1. Completed Test Room Assembly.

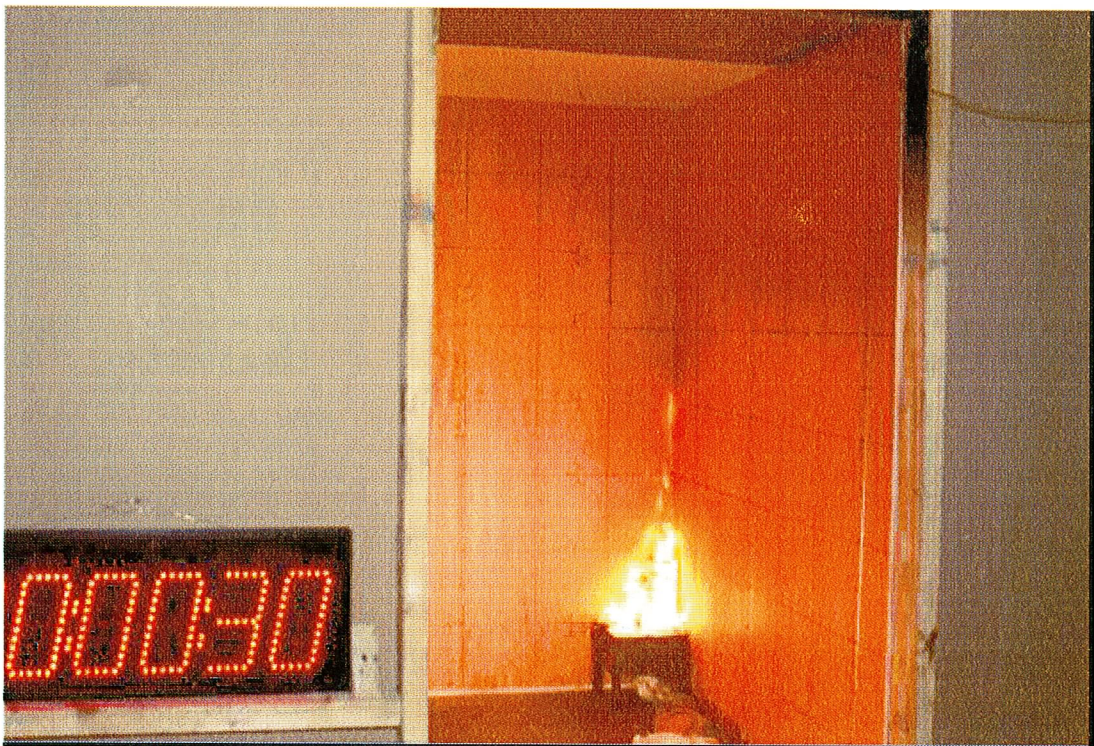


Figure B-2. Start of Test; Burner Set to 40 kW.



Figure B-3. View of Burner Corner; 42 s into Test.

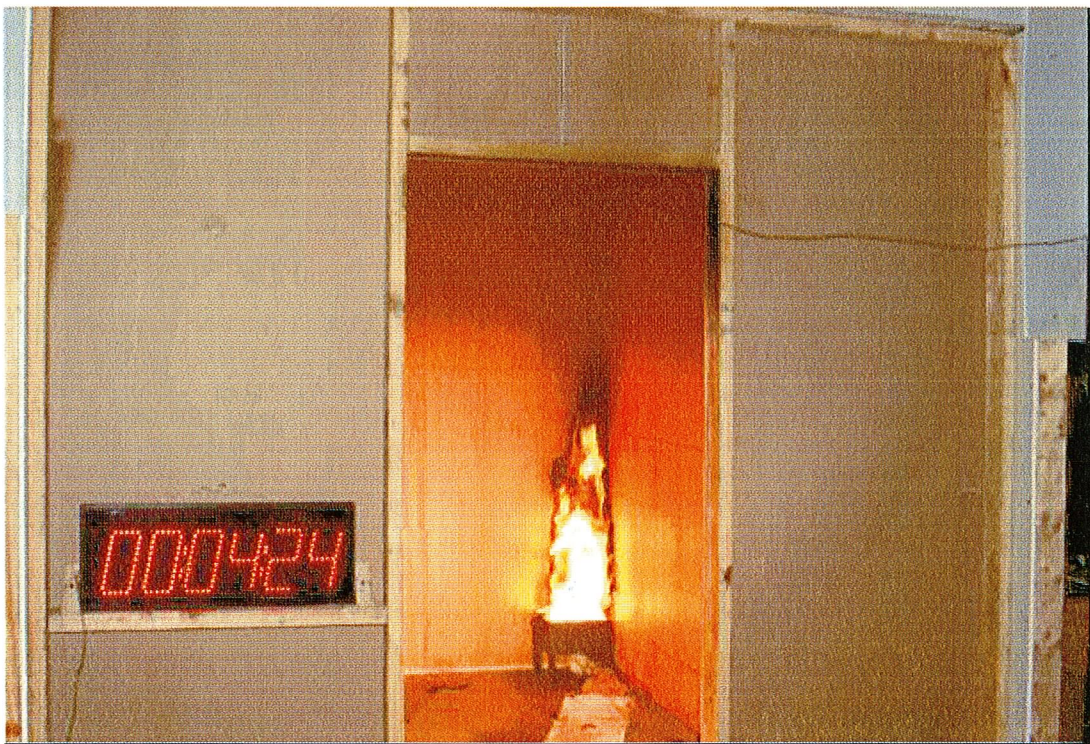


Figure B-4. View of Burner Corner; 4 min 24 s into Test.



Figure B-5. View of Back Wall; Burner Increased to 160 kW; 5 min 12 s into Test.



Figure B-6. View of Burner Corner; 7 min 25 s into Test.



Figure B-7. View of Burner Corner; 15 min into Test; Test Complete.



Figure B-8. End of Test; View of Right Wall at Ceiling.

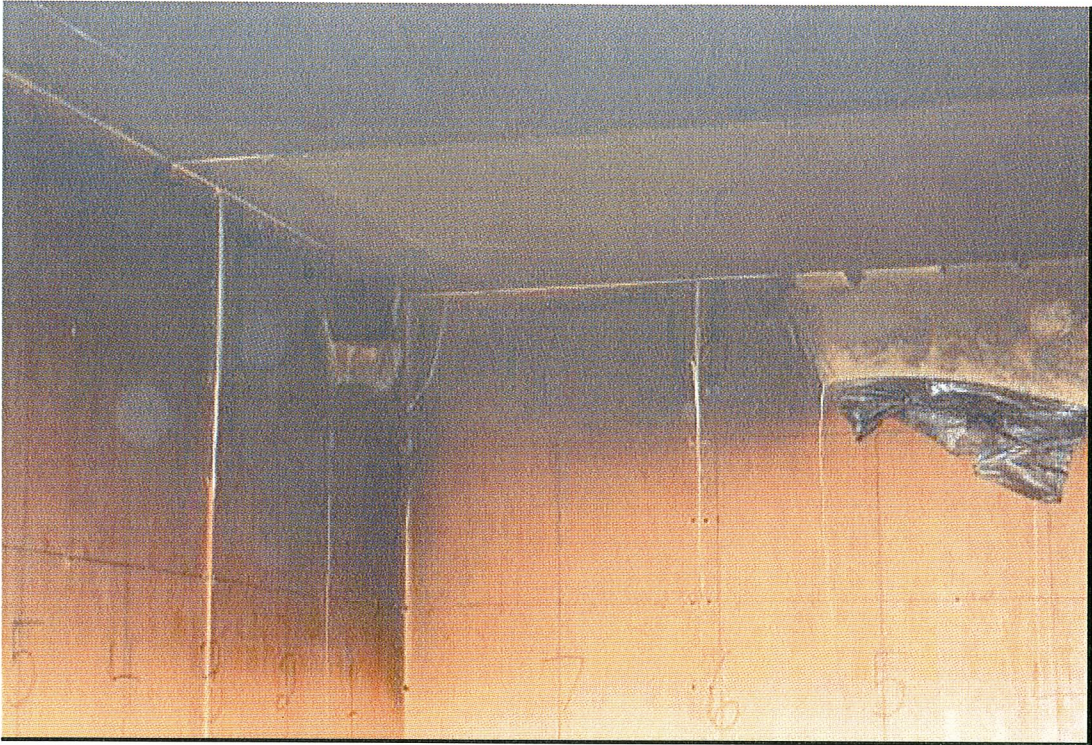


Figure B-9. End of Test; View of Back Corner Opposite Burner.

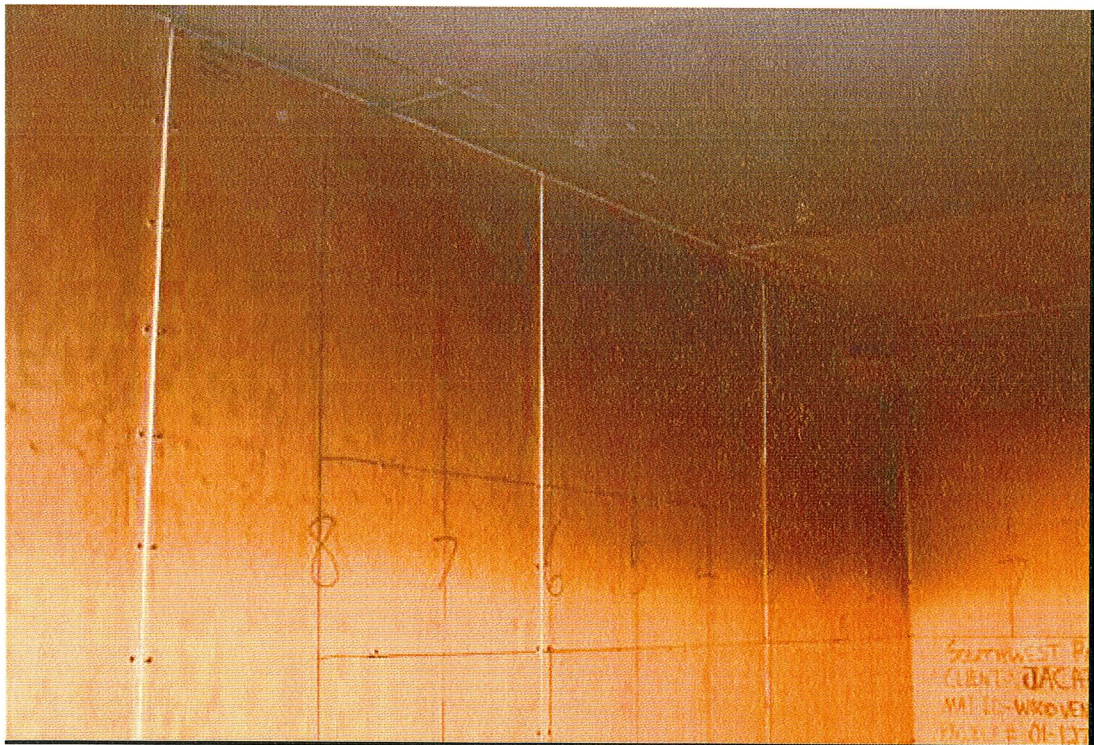


Figure B-10. End of Test; View of Left Wall.

APPENDIX C
VISUAL OBSERVATIONS
(Consisting of 1 Page)

NFPA 286 VISUAL OBSERVATIONS

TIME MIN : SEC	VISUAL OBSERVATIONS
00:00	Start of Test, burner set at 40 kW.
00:10	Flames from the burner are 3 to 3½ ft in height.
00:25	Discoloration and scorching on the wood veneer wallcovering at direct flame impingement from the burner.
00:32	Ignition on the back wall in the burner corner from 1 to 2 ft in height.
00:38	Flames in the burner corner are up to 5 ft in height.
00:41	Flames in the burner corner are 6 ft in height.
00:49	Flames in the burner corner are 6½ to 7 ft in height.
00:52	Flames in the burner corner are beginning to recede in height.
01:00	Flames from the burner are back to 3–3½ ft in height. Light grey layer of smoke in the room interior down to 5½ ft above the floor.
02:15	Flames from the burner are 3–3½ ft in height.
04:00	Reignition of the wood veneer wallcovering burning vertically on the right wall from 1–3 ft in height and approximately 4 in. in width. Reignition on the back wall with same results.
05:00	Burner increased to 160 kW. Flames from the burner are up to the ceiling and flashing 1–2 ft along both walls at the ceiling.
05:10	Flames from the burner are up to the ceiling and burning 5–6 ft along both walls at the ceiling. The wallcovering is burning approximately 12 in. in width along both walls forming the burner corner.
05:30	Flames from the burner are up to the ceiling and burning 5–6 ft along both walls at the ceiling.
05:55	Flames which were 5–6 ft along both walls at the ceiling are now 3 ft along both walls at the ceiling.
07:00	Flames from the burner are up to the ceiling and flashing 1–2 ft along both walls at the ceiling. Light grey smoke down to 5½ ft above the floor.
10:00	No change.
14:30	No surface flaming of the wood veneer wallcovering.
15:00	End of Test, burner extinguished.

POST-TEST OBSERVATIONS

Damage to the room interior measured approximately 14 in. in width along both walls up to the ceiling. The back wall was burned 6 ft from the burner corner, approximately 1 ft down from the ceiling.