

TEST REPORT

The Intertek logo consists of the word "Intertek" in a white, sans-serif font, centered within a dark blue rounded rectangular background.

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EVALUATION CENTER
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RENDERED TO
Icynene, Inc.
6747 Campobello Road
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Canada

PRODUCT EVALUATED: LD-C-50 open cell spray foam and 20 wet mils of DC
315
EVALUATION PROPERTY: Heat Release, Flame Spread

**Report of testing LD-C-50 open cell 0.5 pound spray foam and 20
wet mils of DC 315 for compliance with the applicable
requirements of the following criteria: NFPA 286 and 2006 IBC
Section 803.2.1. / 2009 IBC Section 803.1.2**

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1 Table of Contents

| | |
|--------------------------------|----|
| INTRODUCTION | 3 |
| TEST SAMPLES | 3 |
| TESTING AND EVALUATION METHODS | 3 |
| TESTING AND EVALUATION RESULTS | 6 |
| CONCLUSIONS | 6 |
| APPENDICES | |
| Appendix A: DATA | 7 |
| Appendix B: PHOTOGRAPHS | 12 |
| LAST PAGE | 16 |

2 Introduction

Intertek Testing Services NA (Intertek) has conducted testing for Icynene on LD-C-50 open cell 0.5 pound spray foam with 20 wet mils of DC 315 to evaluate heat release and flame spread properties when subjected to specific ignition conditions. Testing was conducted in accordance with NFPA 286. This evaluation was performed on August 4, 2010.

3 Test Samples

3.1. SAMPLE SELECTION

The subject test specimen is a traceable sample selected from the manufacturer's facility. Intertek selected the specimen and has verified the composition, manufacturing techniques and quality assurance procedures. Samples were received at the Evaluation Center May 26, 2010.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The test specimen consisted of three walls with 2x6 studs, 16 inches o.c. and 2x12 joists, 16 inches o.c. with 5/8 gypsum board on the outside of the studs. The final interior dimensions were 8 feet high, 8 feet wide and 12 feet deep.

The stud cavities were filled with 6 inches of LD-C-50 in the walls and 14 inches of LD-C-50 in the ceiling. Then, 20 wet mils of DC 315 was sprayed on the walls and ceiling.

4 Testing and Evaluation Methods

This standard describes a method for determining the contribution of textile wall and ceiling coverings to room fire growth during specified fire exposure conditions. This method is not intended to evaluate the fire endurance of assemblies, nor is it able to evaluate the effect of fires originating within the wall assembly. The method is not intended for the evaluation of floor finishes.

This method is to be used to evaluate the flammability characteristics of finish wall and ceiling coverings when such materials constitute the exposed interior surfaces of buildings. This test method does not apply to fabric covered less than ceiling height, freestanding, prefabricated panel furniture systems or demountable, relocatable, full-height partitions used in open building interiors. Freestanding panel furniture systems include all freestanding panels that provide visual and/or acoustical separation and are intended to be used to divide space and may support components to form complete work stations.

This fire test measures certain fire performance characteristics of finish wall and ceiling covering materials in an enclosure under specified fire exposure conditions. It determines the extent to which the finish covering materials may contribute to fire growth in a room and the potential for fire spread beyond the room under the particular conditions simulated. The test indicates the maximum extent of fire growth in a room, the rate of heat release, and if they occur, the time to flashover and the time to flame extension beyond the doorway following flashover. It does not measure the fire growth in, or the contribution of, the room contents. Time to flashover is defined herein as either the time when the radiant flux onto the floor reaches 20 kW/m^2 or the temperature of the upper air reaches 600°C . A pair of crumpled single sheets of newspaper is placed on the floor 2 feet out from the center of the rear wall and front walls to determine flashover. The spontaneous ignition of this newspaper provides the visual indication of flashover.

The potential for spread of fire to other objects in the room, remote from the ignition source, is evaluated by measurements of:

1. The total heat flux incident on the center of the floor.
2. A characteristic upper-level gas temperature in the room.
3. Instantaneous net peak rate of heat release.

The potential for the spread of fire to objects outside the room of origin is evaluated by the measurement of the total heat release of the fire.

TEST EQUIPMENT AND INSTRUMENTATION

IGNITION SOURCE

The ignition source for the test is a gas burner with a nominal 12- by 12-inch porous top surface of a refractory material. The burner used at this laboratory is filled with a minimum 4-inch layer of Ottawa sand.

The top surface of the burner through which the gas is applied is positioned 12 inches above the floor, and the burner enclosure is located such that the edge of the diffusion surface is located 1 inch from both walls in the left corner of the room opposite from the door.

The gas supply to the burner is C.P. grade propane (99 percent purity). The burner is capable of producing a gross heat output of $40 \pm 1 \text{ kW}$ for five minutes followed by a $160 \pm 5 \text{ kW}$ for ten minutes. The flow rate is metered throughout the test. The design of the burner controls is such that when one quarter-turn ball valve is opened, the flow of gas to the burner produces 40 kW and when a second quarter-turn valve is opened the combined flow produces 160 kW.

COMPARTMENT GEOMETRY AND CONSTRUCTION

The interior dimensions of the floor of the fire room, when the specimens are in place, measures 8 feet, by 12 feet. The finished ceiling is 8 feet \pm 0.5 inches above the floor. The four walls are at right angles defining the compartment. The compartment contains a 30 ± 0.25 by 80 ± 0.25 inch doorway in the center of one of the 8' by 8' walls. No other openings are present to allow ventilation.

PROCEDURE

SUMMARY OF METHOD

A calibration test is run within 30 days of testing any material as specified in the standard. All instrumentation is zeroed, spanned and calibrated prior to testing. The specimen is installed and the diffusion burner is placed. The collection hood exhaust duct blower is turned on and an initial flow is established. The gas sampling pump is turned on and the flow rate is adjusted. When all instruments are reading steady state conditions, the computer data acquisition system and video equipment is started. Ambient data is taken then the burner is ignited at a fuel flow rate that is known to produce 40 kW of heat output. This level is maintained for five minutes at which time the fuel flow is increased to the 160 kW level for a 10-minute period. During the burn period, all temperature, heat release and heat flux data is being recorded every 6 seconds. At the end of the fifteen minute burn period, the burner is shut off and all instrument readings are stopped. Post test observations are made and this concludes the test.

All damage is documented after the test is over, using descriptions, photographs and drawings, as is appropriate.

4.1. TEST STANDARD

NFPA 286.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

FIRE TESTS

The test was started at 8:30 a.m. on August 4, 2010. The ambient temperature was 84°F with a relative humidity of 75%. The data acquisition system was started and the burner was ignited. Events during the test are described below:

| TIME | |
|------------------|--|
| (min:sec) | OBSERVATION |
| 0:00 | Ignition of burner. Heat output set to 40 kW. |
| 0:10 | Discoloration |
| 0:25 | light smoke |
| 1:23 | Flame tips 5ft vertically above burner |
| 2:11 | Flame tips recede 4ft |
| 4:00 | No change |
| 5:00 | Increase 160 kW |
| 5:04 | Discoloration on ceiling |
| 5:22 | Increase in smoke |
| 7:20 | Decrease in smoke |
| 7:34 | Flame tips 2ft horizontally from corner above burner |

| | |
|-------|---|
| 8:00 | Discoloration on foam 3ft horizontally and 1 to 8ft vertically from corner above burner |
| 10:00 | No change |
| 12:00 | No change |
| 15:00 | Gas off. Test terminated. |

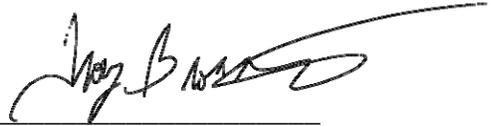
6 Conclusion

NFPA 286 does not publish pass/fail criteria. One must consult the codes to determine pass fail.

This specimen **met** the criteria set forth in the 2006 IBC Section 803.2.1 / 2009 IBC Section 803.1.2

INTERTEK TESTING SERVICES NA

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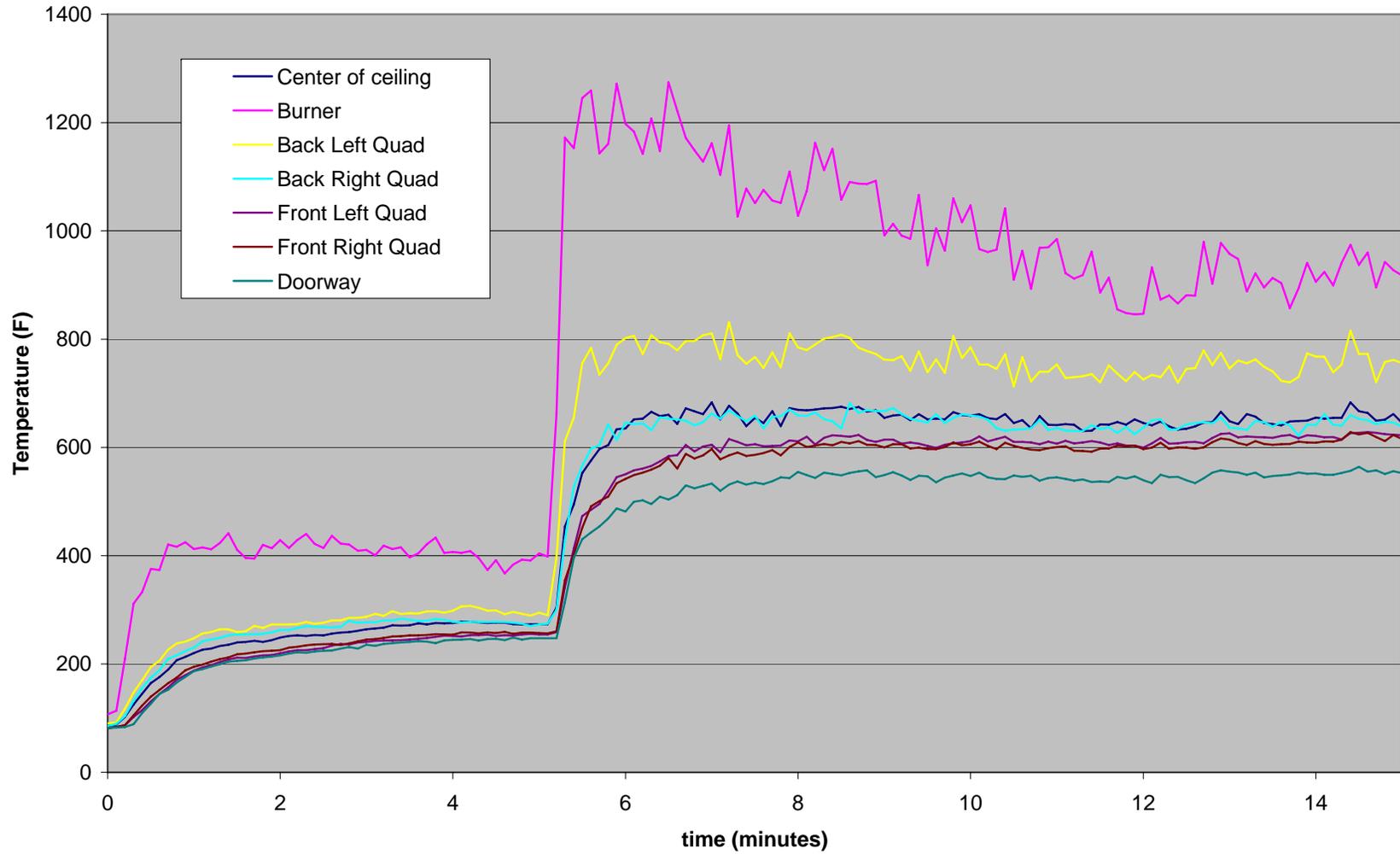


C. Anthony Peñaloza
Engineering Team Leader

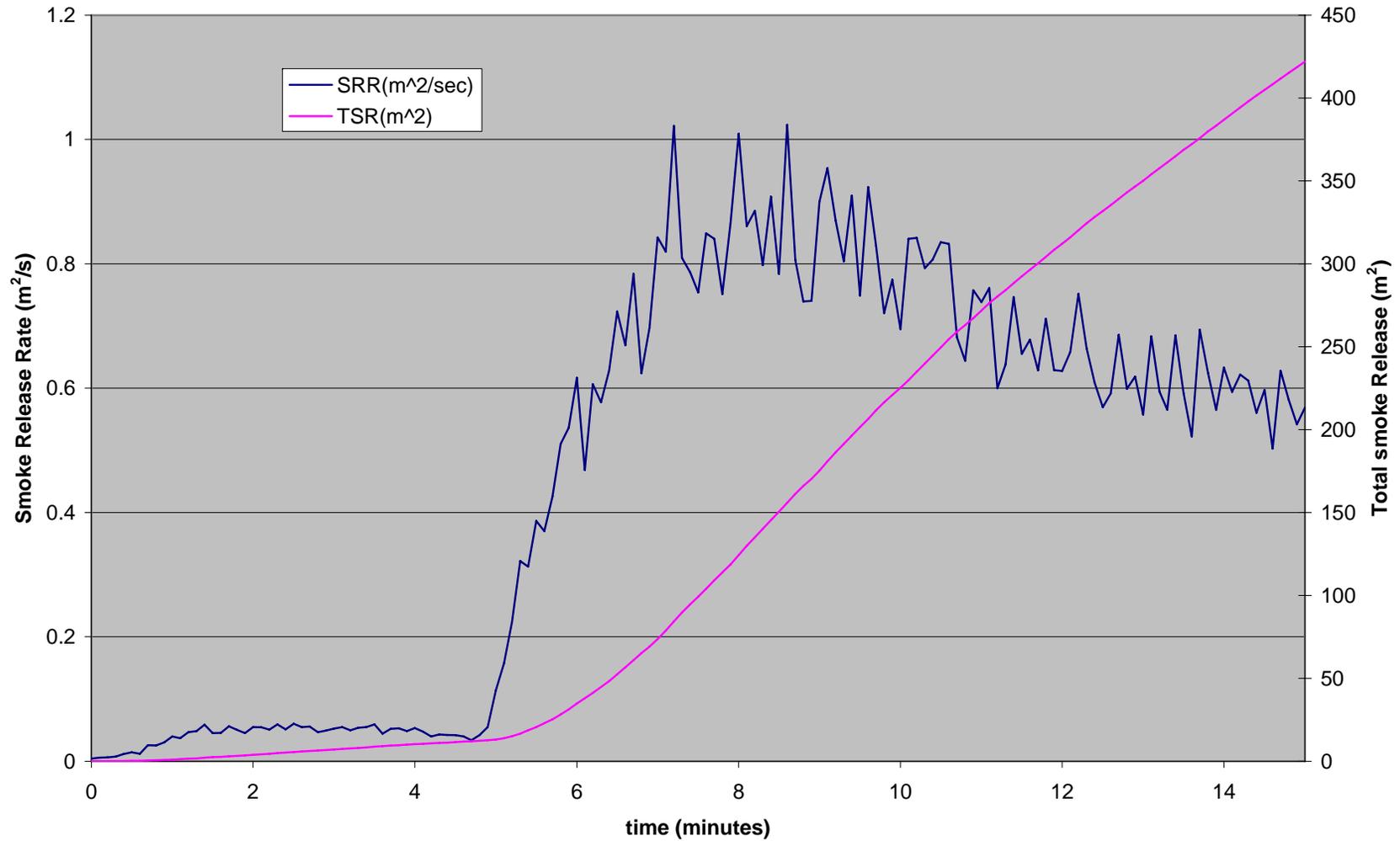
APPENDIX A

Test Data

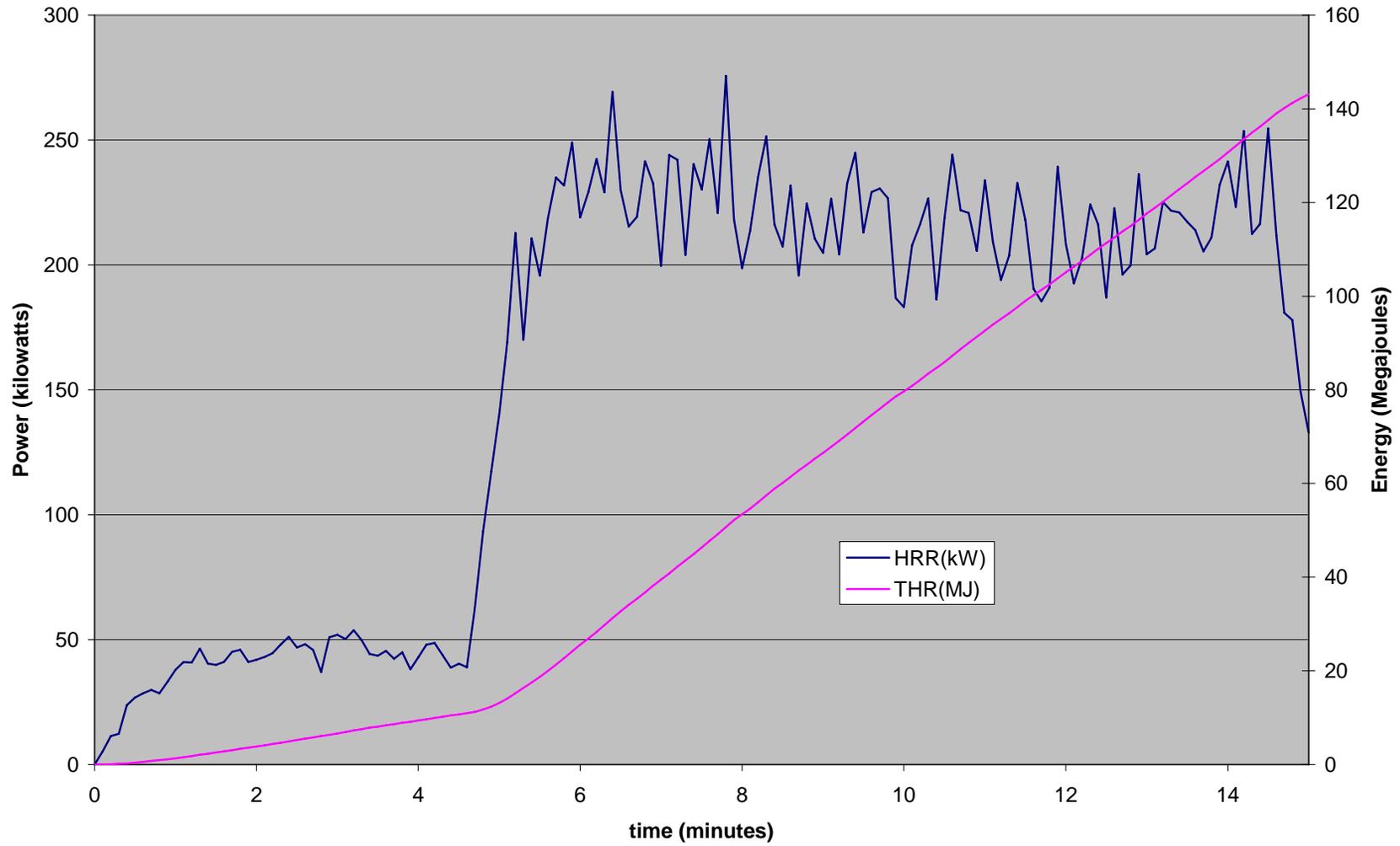
Thermocouple Data



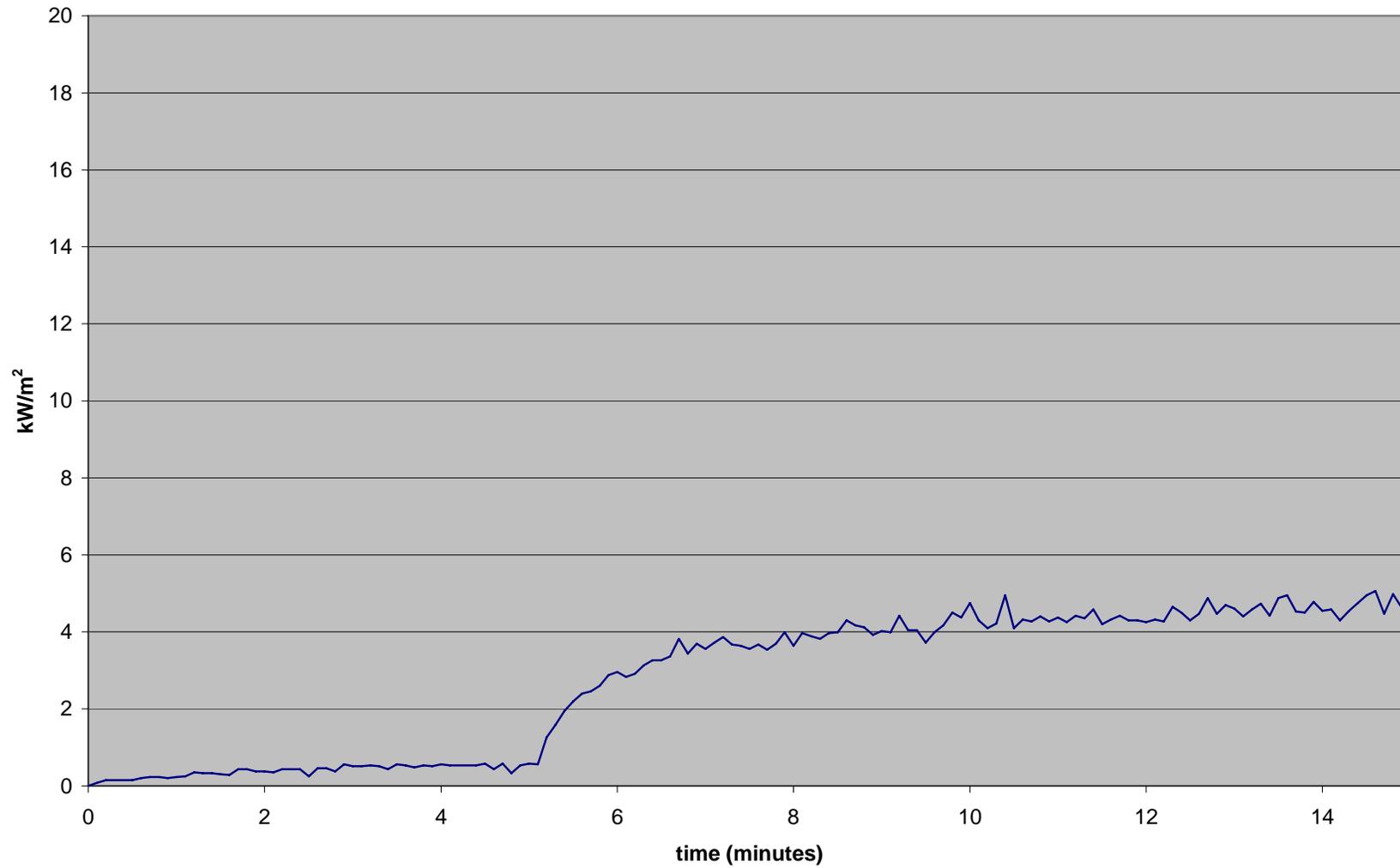
Smoke Release



Heat Release



Radiant Heat

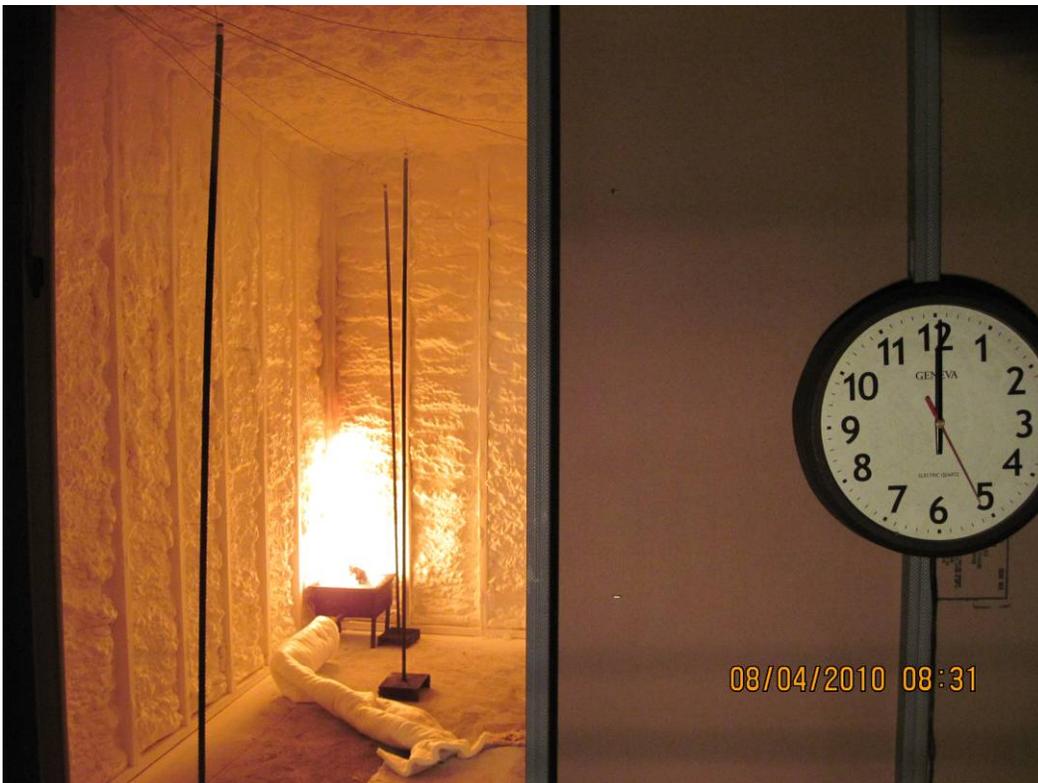


APPENDIX B

Photographs



Pre-test photo



Test photo.



Test photo



160 kW



End of test



Post -test picture

LAST PAGE OF TEST REPORT

REVISION SUMMARY

| DATE | SUMMARY |
|----------------|----------------------------|
| August 4, 2010 | First issue. No revisions. |