TEST REPORT

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EVALUATION CENTER
Intertek Testing Services NA Inc.
16015 Shady Falls Rd.
Elmendorf, TX 78112

RENDERED TO
LaPolla Industries Inc
15402 Vantage Parkway East Suite 322
Houston, TX 77032,US

PRODUCT EVALUATED: Foam- Lok™ on walls and ceiling.
EVALUATION PROPERTY: Heat Release, Flame Spread

Report of testing Foam-Lok™ FL 2000 closed cell Spray-in-Place Polyurethane foam for compliance with the applicable requirements of the following criteria: NFPA 286 as modified by AC 377 Appendix X.

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1 Table of Contents

2 Introduction

Intertek Testing Services NA (Intertek) has conducted testing for LaPolla Industries to evaluate heat release and flame spread properties of Foam Lok™ FL 2000 when subjected to specific ignition conditions. Testing was conducted in accordance with NFPA 286 and AC 377 Appendix X. This evaluation was performed on September 17, 2009.

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

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The test specimen consisted of three walls with 2x10 studs, 24 inches on center and 2x12 joists, 24 inches on center The joists ran the 12 ft length of the room (front to back).The exterior of the room was covered with 5/8 Type X gypsum wallboard. The final interior dimensions were 8 feet high, 8 feet wide and 12 feet deep.

The stud cavities were filled 10 1/2 inches of closed cell Foam in the walls and 11 1/2 inches of Foam in the 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 as per Figure X3 in AC377 in either back 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±1 for five minutes followed by a 160±5 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 ± 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

ICC AC 377 Appendix X pass/ fail criteria for spray-applied foam plastic insulation.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

FIRE TESTS
The test was started at 2:00 p.m. on September 17, 2009. The ambient temperature was 88°F with a relative humidity of 39%. 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.
0:12	Discoloration on back wall above burner
0:17	ignition
0:25	Horizontal flaming 4 ft ceiling and back wall (heavy smoke)
0:40	Flames recede to just burner
2:24	Decrease in smoke
4:18	No flashover (test continued)
5:00	160 KW
5:08	Horizontal flaming 4ft on ceiling, back and side wall.
5:22	Flames out door
5:26	Test terminated

6 Conclusion

The AC 377 Appendix X pass/fail criteria requires the assembly to surpass 4:18 min/sec.

This assembly **MET** the requirements.

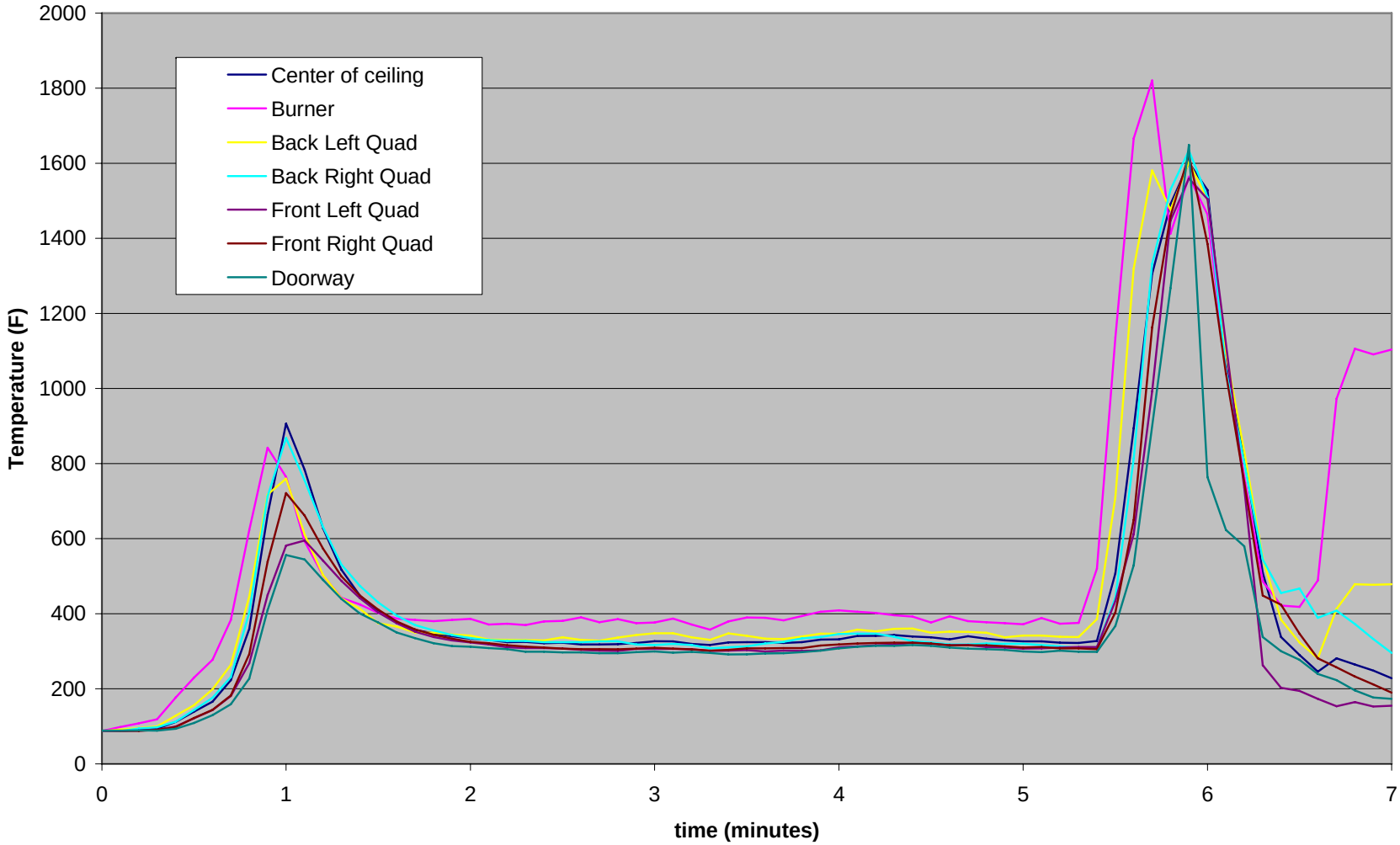
INTERTEK TESTING SERVICES NA

Reported by: _____
Troy G. Bronstad
Team Leader, Building Products

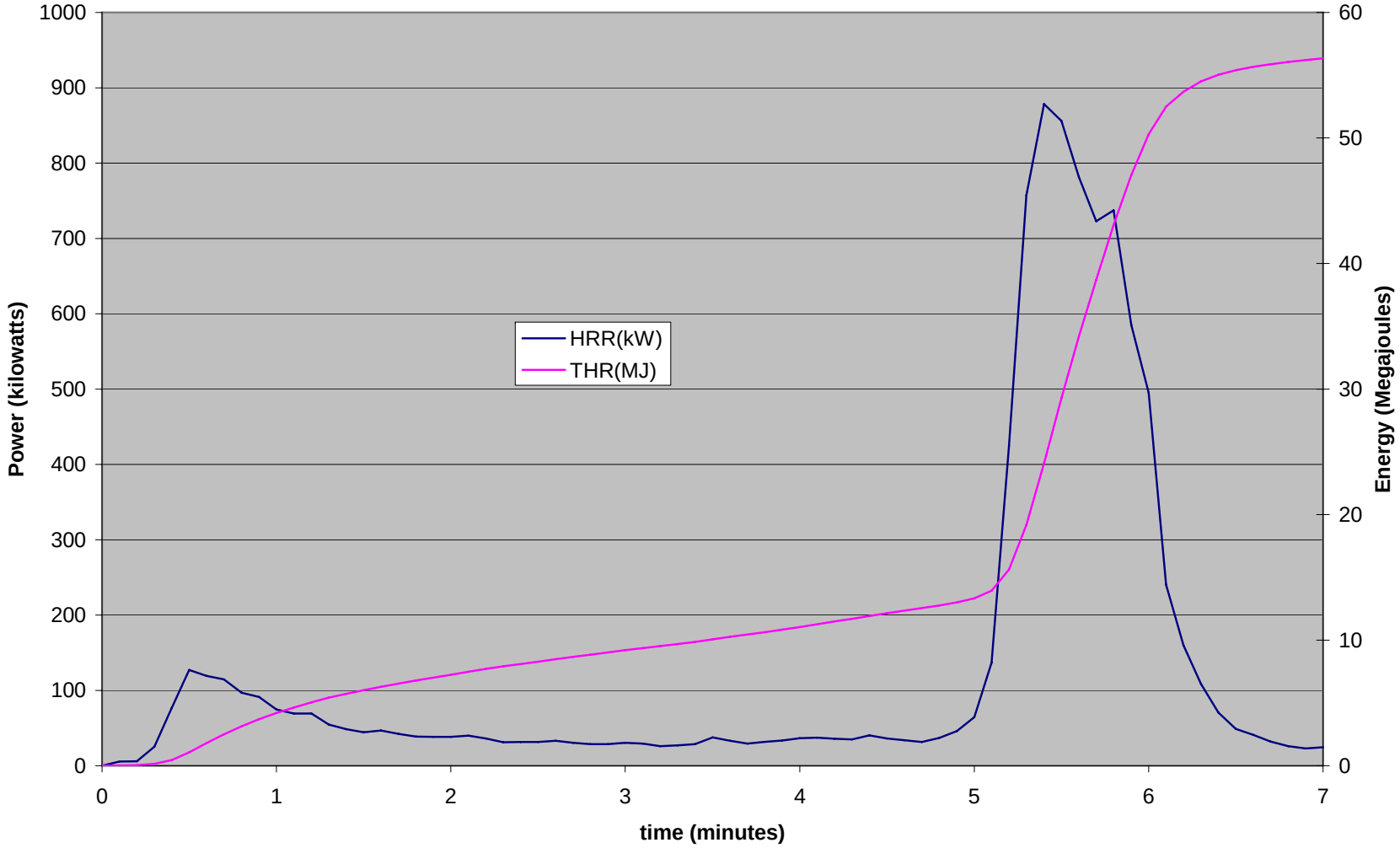
Reviewed by: _____
C. Anthony Peñaloza
Flammability Testing Team Leader, Building Products

APPENDIX A
Test Data

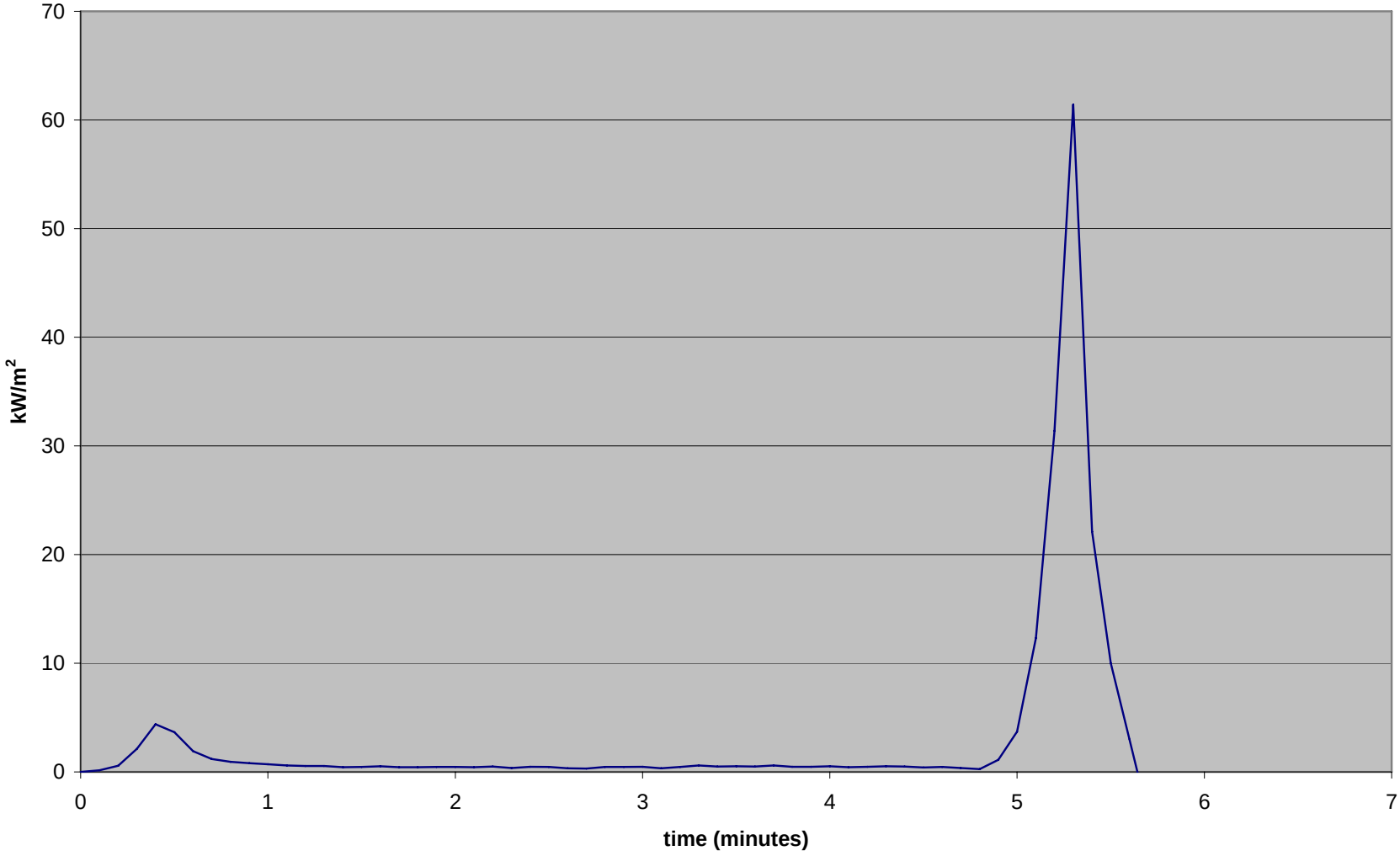
Thermocouple Data



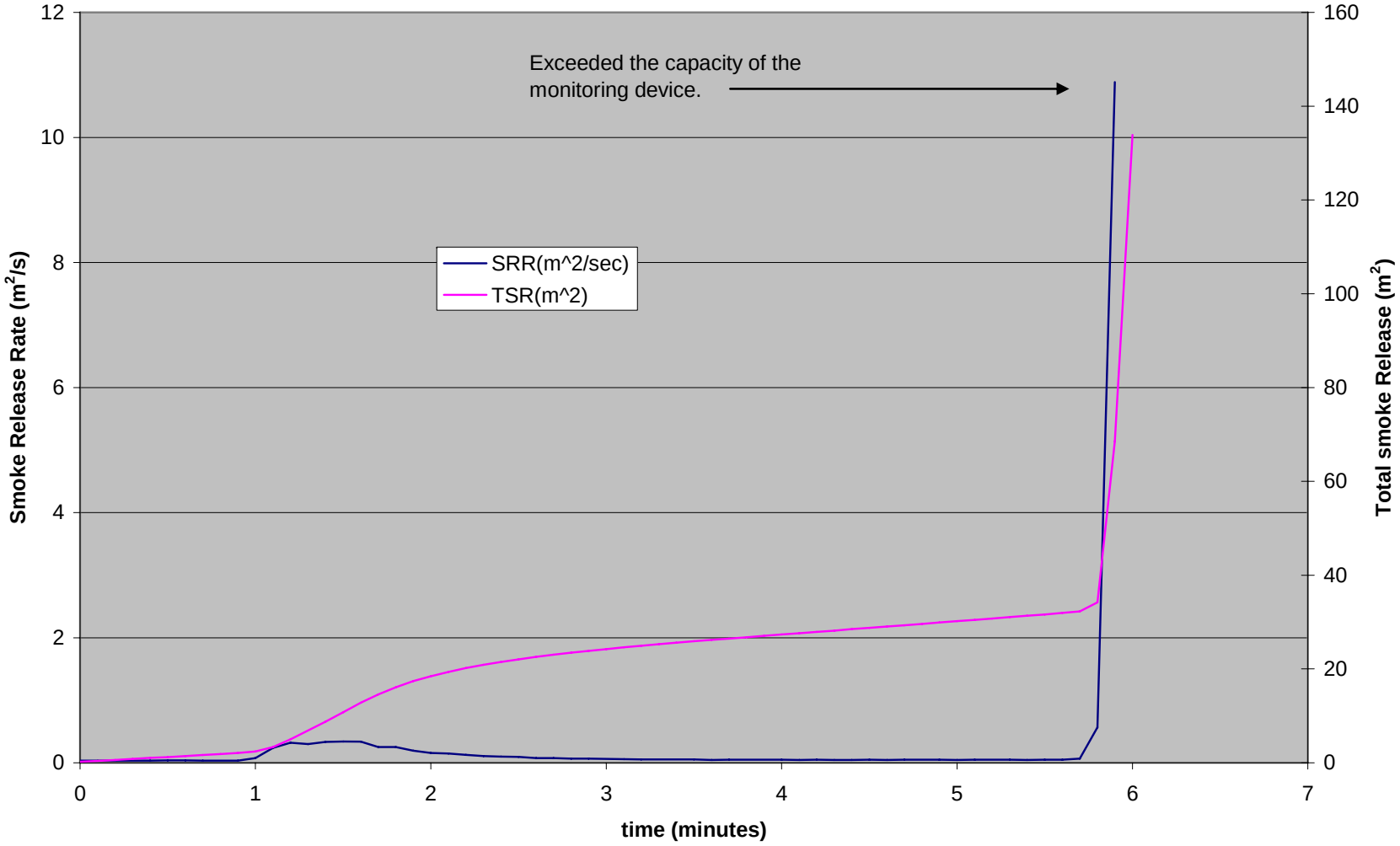
Heat Release



Radiant Heat



Smoke Release



APPENDIX B
Photographs

Pre-test photo

Start of test

Test photo.

Test photo

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Test picture just prior to 160KW

Test picture at 160 KW

Flames exiting door

Post test picture of entire room

Post test picture of char depth 4ft above burner

LAST PAGE OF TEST REPORT

REVISION SUMMARY

DATE	SUMMARY
September 17, 2009	First issue. No revisions.