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**RENDERED TO**

**Fire Retardant Coatings of Texas**  
**1150 Blue Mound Rd. West**  
**Haslet, TX 76052**

**PRODUCT EVALUATED: 7'X7' Floor/Ceiling Assembly**  
**EVALUATION PROPERTY: Fire Resistance**

**Report of Testing 7'X7' Floor/Ceiling Assembly for compliance with the applicable requirements of the following criteria: Modified ASTM E119-12a Standard Test Methods for Fire Tests of Building Construction and Materials, 2012 Edition.**

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## 2 Introduction

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for Fire Retardant Coatings of Texas, on their 7'X7' Floor/Ceiling Assembly, to evaluate its fire resistance. Testing was conducted in accordance with the applicable requirements of, and following the standard methods of, Modified **ASTM E119-12a Standard Test Methods for Fire Tests of Building Construction and Materials, 2012 Edition**. This evaluation took place on August 21, 2013.

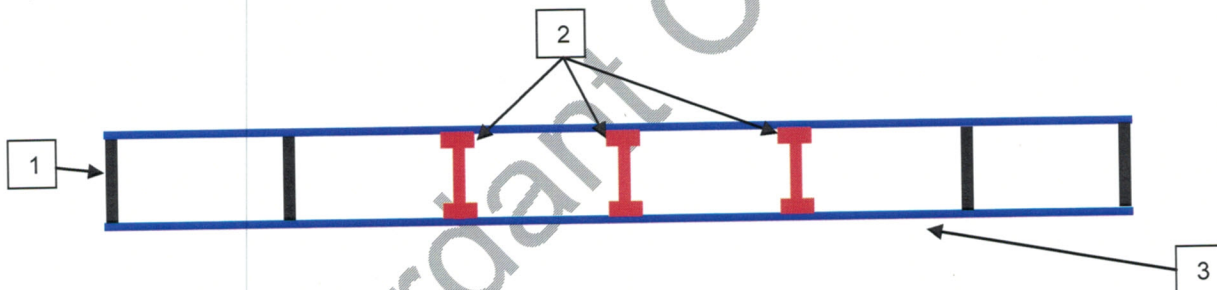
## 3 Test Samples

### 3.1. SAMPLE SELECTION

Samples were submitted to Intertek directly from the client. Samples were not independently selected for testing. Samples (Intertek I.D. Nos. SAT1308061725-001 through -003) were received at the Evaluation Center on August 6, 2013.

### 3.2. SAMPLE AND ASSEMBLY DESCRIPTION

A symmetrical, 7' x 7', non-load bearing floor/ceiling was constructed of lumber framing, wood joists, intumescent caulking, and magnesium-oxide board cladding (see Appendix A).



1. Framing – nominal 2 x 9-1/2" wood members were installed around the perimeter and attached with three 3-1/2" long Deck Mate screws at each location.
2. Joists – 7' x 9-1/2" TJI Trus Joists spaced 16" o.c., attached to the perimeter board using four 3-1/2" long Deck Mate screws; two screws at each cord (top and bottom) at each location. Two joists were installed using the same wood members as the framing between the I-joists and the perimeter framing, spaced 16" o.c. from the I-joists.
3. Cladding – 4' x 8' x 1/2" thick MagBoard™ (Fiber-Reinforced Magnesium-Oxide-Based Sheet); installed with the long edge perpendicular to the joists and secured using #8 x 1-1/4" long, coarse thread screws spaced nominally 8" o.c. A nominal 1/4" bead of 3M™ Fire Barrier Sealant CP 25WB+ (intumescent) caulking was applied at the butt joints of the MagBoard™. The joints of the cladding were staggered 24" o.c. from the exposed to the unexposed side of the assembly.

## 4 Testing and Evaluation Methods

### 4.1. INSTRUMENTATION

The unexposed surface of the assembly was instrumented with a total of six (6), 24 GA. Type K, fiberglass jacketed thermocouples, located on the unexposed side (see Appendix A). The output of the thermocouples and the furnace probes were monitored by a 300-channel Yokogawa, Inc., Darwin Data Acquisition Unit. The computer was programmed to scan data every 6 seconds and save data every 30 seconds. Following the test, the files were imported into MS Excel for tabular and graphical display (presented in Appendix B).

### 4.2. TEST STANDARD

Testing was conducted in accordance with the applicable requirements of, and following the standard methods of a **Modified ASTM E119–12a Standard Test Methods for Fire Tests of Building Construction and Materials, 2012 Edition.**

#### 4.2.1. Deviation From Standard Method

R & D testing on a 7'x7' floor/ceiling assembly. Sample does not meet the minimum size requirements per the standard and due to the size only 6 unexposed thermocouples were installed.

The assembly was secured to the small scale horizontal furnace and was tested to the standard time-temperature curve described in the E119 standard.

## 5 Testing and Evaluation Results

### 5.1. RESULTS AND OBSERVATIONS

The test was initiated on August 21, 2013. The ambient temperature at the time of the test was 82 °F and the relative humidity was 71 % R.H.

Observations made during the test are listed below:

| Time (min:sec) | Observations  |
|----------------|---|
| 0:00           | The test was initiated at 9:15 A.M.   |
| 3:00           | The exposed MagBoard™ darkened in color   |
| 5:00           | There was intumescent char along the center of the exposed joint  |
| 10:00          | There was steaming around the perimeter of the sample   |
| 18:00          | There was a small amount of buckling of the MagBoard™ at the joint between the joists on the exposed side |
| 33:00          | The steaming ceased from around the perimeter   |



|       |   |
|-------|---|
| 39:00 | There was hairline cracking on the exposed side MagBoard™ with buckling at the joint    |
| 48:00 | There was flaming at the joint on exposed side  |
| 56:00 | There was a popping sound from the sample   |
| 58:00 | There was increased flaming on the exposed side of the sample                           |
| 60:00 | The MagBoard™ was still attached on the exposed side with visual buckling at the center |
| 61:00 | The sample exceeded the average failing point   |
| 64:00 | The test was terminated   |

The assembly withstood the effects of the fire test without passage of flame or gasses hot enough to ignite cotton waste. The heat conducted through the assembly did cause the temperatures measured by the thermocouples to exceed the 250°F rise in average temperature at 61 minutes and exceed the 325°F rise limit at 63 minutes for an individual thermocouple.

## 5.2. EXAMINATION OF RESULTS

### 5.2.1. Correction Factor for the Fire Endurance Test

In accordance with the E119 test standard, a calculation for any correction to the indicated fire resistance period was done. The correction factor was then mathematically added to the indicated fire resistance period, yielding the fire resistance period achieved by this specimen:

#### Correction Factor for the Fire Endurance Test

| ITEM | DESCRIPTION   | TEST VALUE     |
|------|---|----------------|
| C    | correction factor   | -0.04          |
| I    | indicated fire-resistance period  | 61 minutes     |
| A    | area under the curve of indicated average furnace temperature for the first three fourths of the indicated period | 59794 (°F•min) |
| As   | area under the standard furnace curve for the same part of the indicated period                                   | 59863 (°F•min) |
| ITEM | DESCRIPTION   | TEST VALUE     |
| L    | lag correction  | 3240           |
|      | FIRE RESISTANCE PERIOD ACHIEVED BY THIS SPECIMEN ==>  | 61 minutes     |

Note: Note: The standard specifies that the fire resistance be determined to the nearest integral minute. Consequently, if the correction factor is less than 30 seconds, and the test specimen met the criteria for the full indicated fire resistance period, no correction is deemed necessary.

## 6 Conclusion

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Intertek Testing Services NA, Inc. (Intertek) has conducted testing for Fire Retardant Coatings of Texas, on their 7'X7' Floor/Ceiling Assembly, to evaluate its fire resistance. Testing was conducted in accordance with the applicable requirements of, and following the standard methods of, Modified **ASTM E119-12a Standard Test Methods for Fire Tests of Building Construction and Materials, 2012 Edition**. This evaluation took place on August 21, 2013.

Based on the results of this test, the non-load-bearing 7'X7' Floor/Ceiling Assembly achieved a fire resistance rating of 61 minutes.

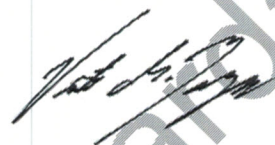
The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

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