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METAL DESIGN SYSTEMS, INC.

Letter of Results

SCOPE OF WORK
NFPA 285 TESTING 4MM REYNOBOND® FR ACM PANELS ATTACHED TO TECHNOFORM HYBRID THERMAL SPACERS, OWENS CORNING® TERMAFIBER® RAINBARRIER® 45 INSULATION AND GRACE PERM-A-BARRIER® VAPOR PERMEABLE AIR BARRIER

REFERENCE PROJECT NUMBER
G3195.02-121-24-R1

TEST DATE
09/30/16

REPORT ISSUE DATE
11/18/16

RECORD RETENTION END DATE
09/30/20

PAGES
5

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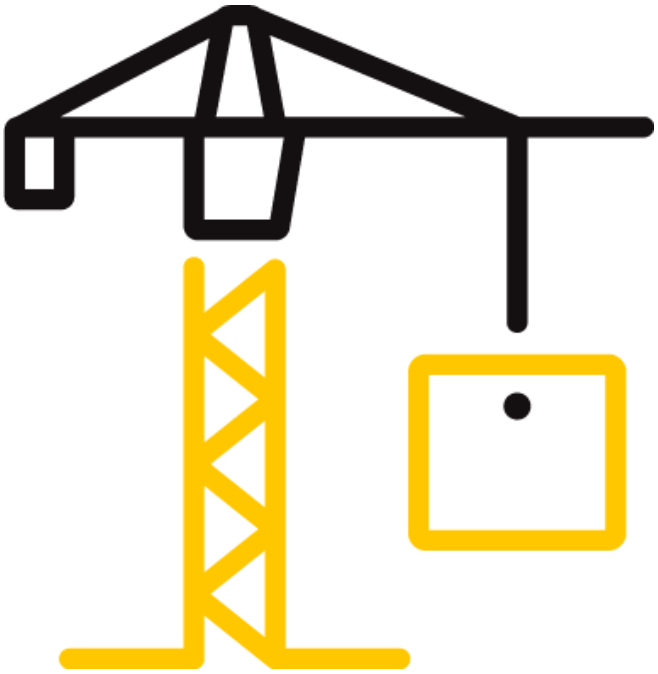

130 Derry Court
York, Pennsylvania 17406

Telephone: 717-764-7700
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www.intertek.com/building

TEST CERTIFICATE FOR METAL DESIGN SYSTEMS, INC.
Project No.: G3195.02-121-24-R1
Date: 08/23/17

CERTIFICATE ISSUED TO

Metal Design Systems, Inc.
4150 C Street SW
P.O. Box 1165
Cedar Rapids, Iowa 52406

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Metal Design Systems, Cedar Rapids, Iowa to evaluate the flame propagation characteristics of an exterior, non-load-bearing wall assembly containing Metal Design Systems, Inc. Series 20 exterior cladding panel attachment system. Testing was conducted at the Intertek B&C test facility in York, Pennsylvania. Results obtained are tested values and were secured by using the designated test method(s). A summary of test results and test assembly is reported herein.

This report does not constitute a complete test report, certification of this product, nor an opinion or endorsement by this laboratory. For full details of the project, reference Intertek-ATI test report number G3195.02-121-24-R1

SECTION 2

SUMMARY OF TEST RESULTS

Wall System: Exterior Non-load-bearing Wall Assembly
Combustible Components: 4 mm Reynobond® ACM with FR core (RB160FR) Panels, Technoform Hybrid Thermal Spacers, Owens Corning® Thermafiber® Rainbarrier® 45 mineral wool insulation, and Grace Perm-A-Barrier® Vapor Permeable Air Barrier

NFPA 285 Test Results
The assembly described and tested in this report **did** meet the Conditions of Acceptance of NFPA 285. Construction of the tested assembly is summarized in Section 3 of this test report.

For INTERTEK B&C:

COMPLETED BY:	Scott Gingrich	**REVIEWED BY:**	Ethan Grove
TITLE:	Senior Technician – Fire Testing	**TITLE:**	Manager – Fire Testing
SIGNATURE:	 Digitally Signed by: Scott Gingrich	**SIGNATURE:**	 Digitally Signed by: Ethan Grove
DATE:	08/23/17	**DATE:**	08/23/17

SDG:ddr

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SECTION 3
TEST METHOD

The assembly was evaluated in accordance with the following:

> **NFPA 285-12**, *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components*

SECTION 4
TEST PROCEDURE

The wall assembly was instrumented with thermocouples (TCs) in accordance with figures 6.1(a) and 6.1(b) of NFPA 285 test method. 18-gauge Type "K" TCs were used in the burn room and 20-gauge Type "K" was used on exterior façade and cavity air space. The window burner was positioned in the center of the opening and 3 in. off the exterior face of the wall assembly. Testing was performed on 09/30/2016 in accordance with NFPA 285 test method. Ambient conditions were 66°F and 66% relative humidity. An anemometer was used to verify airflow across test assembly was less than 4 ft./sec as specified in the test method. Video recording, digital photographs, visual observations, and data collection were performed prior, during, and after testing was completed. Temperature data was recorded every 15 seconds. The test was performed at 09:20 AM with the burners on for 30 minutes. All observations are recorded in the table located in Section 6.

The apparatus is considered to be under calibrated conditions when the time average temperatures and the time average heat flux readings obtained for a calibration wall match the requirements of Table 8.1.6 of NFPA 285. Calibration was performed on February 18, 2016 with natural gas as the fuel source and the window burner placed 3 inches from the exterior surface of the assembly.

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SECTION 5
TEST ASSEMBLY DESCRIPTION

For complete assembly description and installation procedures, reference Intertek-ATI Test Report number G3195.02-121-24-R1.

Interior Cladding
5/8 in. thick National Gypsum Gold Bond® Fire-Shield® gypsum board meeting the requirements of ASTM C1396

Framing
6 inches deep, 18 gauge galvanized steel studs fastened 6 inches deep, 18 gauge galvanized steel track every 16 inches on center. Horizontal 16 gauge x 1-1/2 inches wide CRC galvanized steel bracing was fit into the knockouts of the studs and fastened to the studs every 4 feet above the window opening using ClarkDietrich FastBridge™ FB43 clips. Johns Manville MinWool® Safing pieces with a nominal density of 4.0 lbs. /cu. ft. were installed per the manufacturer's installation instructions to fit into each stud cavity placed at the floor line.

Exterior Sheathing
1/2 inch thick USG Securock® Brand Glass-Mat sheathing panels meeting ASTM C1177 were placed horizontally across the exterior surface of the assembly.

Water-resistive Barrier
Grace Perm-A-Barrier® Primer Plus was applied over the full exterior surface of the assembly in accordance with the manufacturer's recommended application rate of 450-500 square feet per gallon. Once applied, Grace Perm-A-Barrier® VP was applied vertically over the full exterior surface of the assembly. The overlap of the vertical rows was 2 inches.

Exterior Insulation
4 inches thick Owens Corning® Thermafiber® Rainbarrier® 45 mineral wool insulation with dimensions of 16 inches wide x 48 inches long was placed over the full exterior surface of the assembly. The insulation was retained against the wall by compression of the other insulation batts and thermal spacer clips.

Window Opening
A 78 inch wide x 30 inch tall window opening was constructed with 18 gauge galvanized steel track centered on the vertical centerline of the wall assembly. Upon completion of the exterior cladding, the window was flashed with 0.080 inch thick aluminum flashing.

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SECTION 5 (Continued)
TEST ASSEMBLY DESCRIPTION

Exterior Cladding
3-3/4 inches thick Technoform TE Hybrid Thermal Spacers were attached to each vertical framing member. A 0.110 inch thick Aluminum Extrusion (6063-T6) x 4 inches long was placed over the thermal spacers before fastening. Once the thermal spacers and insulation were installed, 4 mm Reynobond® ACM with FR core (RB160FR) panels were then installed over the full exterior surface using Metal Design Systems, Inc. (MDSI) series 20 attachment system.

SECTION 6
TEST OBSERVATIONS

TIME	OBSERVATIONS
00:00	Ignition of the room burner.
00:35	Window header flashing begins to warp.
01:43	Vapor from the left window jam.
02:00	Ignition of the interior first story gypsum board. Sustained ignition at the window header.
05:00	Ignition of the window burner.
05:19	Panels above window header begins to swell.
12:46	Window header flashing begins to drip.
21:44	Surface burning up to 1 foot above the window opening header.
23:05	Surface burning up to 3 feet above the window opening header.
25:15	Panel above the window header outer skin melts away and opens.
30:00	The burners were extinguished.
40:00	Test observations stopped.

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SECTION 7
TEST RESULTS

TEST REQUIREMENTS	TEST RESULTS	PASS/FAIL
Flames did not reach 10 ft. above the window opening header.	Flames did not reach 10 ft. above the window opening header.	**PASS**
Flames did not reach a lateral distance of 5 ft. from the vertical centerline.	Flames did not reach a lateral distance of 5 ft. from the vertical centerline.	**PASS**
Flames did not propagate beyond the limits of the first story test room.	Flames did not propagate beyond the limits of the first story test room.	**PASS**
No visible flaming in the second story test room	No visible flaming in the second story test room.	**PASS**
TC's 11 and 14-17 (1000°F limit)	TC's 11, and 14-17 did not exceed their 1000°F test limit.	**PASS**
TC's 18-19, 28, and 31-40 (1000°F limit)	TC's 18-19, 28, and 31-40 did not exceed the 1000°F limit	**PASS**
TC's 55-67 (750°F above ambient)	TC's 55-67 did not exceed 750°F above their ambient temperatures.	**PASS**
TC's 49-54 (500°F above ambient)	TC's 49-54 did not exceed 500°F above their ambient temperatures.	**PASS**