

ALCO PANEL CO. LTD

FIRE TEST REPORT

SCOPE OF WORK

NFPA 285 TESTING ON EXTERIOR NON-LOAD-BEARING WALL ASSEMBLY CONTAINING
ALCOPANEL'S 4MM THICK ALCOPANEL FR

REPORT NUMBER

L7527.01-121-24-R0

TEST DATE

02/26/21

ISSUE DATE

03/09/21

RECORD RETENTION END DATE

02/26/25

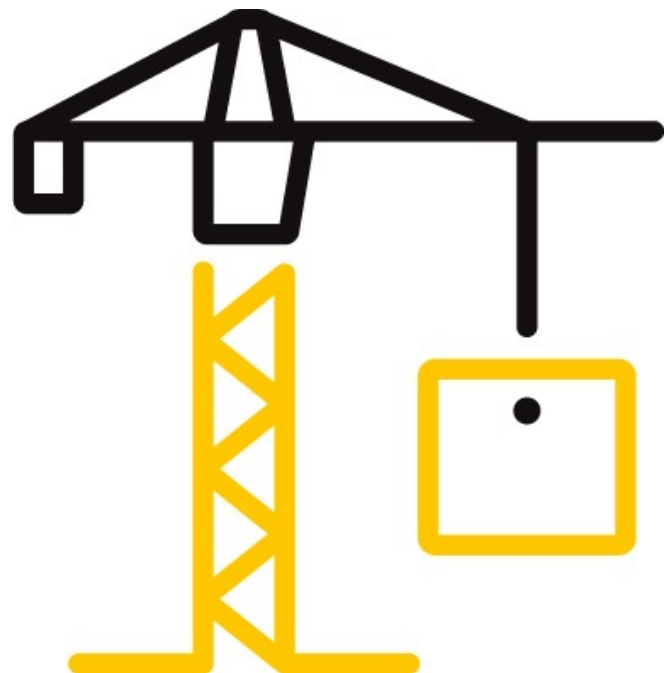
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TEST REPORT FOR ALCO PANEL CO. LTD

Report No.: L7527.01-121-24-R0

Date: 03/09/21

REPORT ISSUED TO

ALCOPANEL CO., LTD

7F, Gangnam Main Tower, 275

Gangnam-Daero, Seocho-gu, Seoul, 06729

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by ALCOPANEL CO., LTD, 7F, Gangnam Main Tower, 275 Gangnam-Daero, Seocho-gu, Seoul, 06729 to evaluate the flame propagation characteristics of an exterior, non-load-bearing wall assembly containing ALCOPANEL's 4mm thick ALCOPANEL FR aluminum composite material (ACM) panels. 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 the complete graphical test data is reported herein.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

Wall System: Exterior Non-load-bearing Wall Assembly

Combustible Components: 4mm thick ALCOPANEL FR ACM's

NFPA 285 Test Results

The assembly described and tested in this report **did** meet the Conditions of Acceptance of NFPA 285. Construction of the full assembly is summarized in Section 7 of this test report.

For INTERTEK B&C:

COMPLETED BY:	Nathan Brillhart	REVIEWED BY:	Ethan Grove
TITLE:	Technician – Fire Testing	TITLE:	Manager – Fire Testing
SIGNATURE:	 Digitally Signed by: Nathan Brillhart	SIGNATURE:	 Digitally Signed by: Ethan Grove
DATE:	03/09/21	DATE:	03/09/21

NDB:ddr

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SECTION 3

TEST METHOD

The assembly was evaluated in accordance with the following:

NFPA 285-19, *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components*

SECTION 4

MATERIAL SOURCE/INSTALLATION

The components of the test assembly were provided by the client except for the core wall components that were acquired and assembled by Intertek B&C personnel.

SECTION 5

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Nathan Brillhart	Intertek B&C
Scott Gingrich	Intertek B&C
Mark Dluzeski	Intertek B&C

SECTION 6

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 3-3/4 in. off the exterior face of the wall assembly. Testing was performed on 02/26/2021 in accordance with NFPA 285 test method. Ambient conditions were 68°F and 21% 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 4:14 PM with the burners on for 30 minutes. All observations are recorded in the table located in Section 8.

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SECTION 6 (Continued)

TEST PROCEDURE

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 25, 2021 with natural gas as the fuel source and the window burner placed 3-3/4 inches from the exterior surface of the assembly. Table 6.1 of this section shows the average burner flow and heat flux. Table 6.2 shows the time average temperatures obtained during the calibration test.

Table 6.1 Average Burner Output Information

TIME INTERVAL (MIN:SEC)	ROOM BURNER (SCFM)	WINDOW BURNER (SCFM)	2 FT FLUX (W/cm ²)	3 FT FLUX (W/cm ²)	4 FT FLUX (W/cm ²)
0:00-5:00	36.1	0.0	1.1	0.9	1.0
5:00-10:00	35.5	4.2	2.1	1.8	1.7
10:00-15:00	43.8	5.6	2.9	2.4	1.9
15:00-20:00	43.7	8.0	3.4	2.8	2.3
20:00-25:00	43.6	11.0	4.0	3.1	2.5
25:00-30:00	47.6	15.6	4.6	3.6	3.0

Table 6.2 Average Time Temperature Values for Calibration*

TIME INTERVAL (MIN:SEC)	THERMOCOUPLE LOCATIONS							
	BURN ROOM (°F)	INT. WALL (°F)	1FT (°F)	2FT (°F)	3FT (°F)	4FT (°F)	5FT (°F)	6FT (°F)
0:00-5:00	1083	1070	711	768	717	640	581	514
5:00-10:00	1212	1192	911	961	959	935	879	800
10:00-15:00	1388	1370	1029	1083	1078	1061	989	915
15:00-20:00	1445	1425	1066	1122	1113	1107	1078	1013
20:00-25:00	1469	1448	1090	1147	1146	1139	1127	1089
25:00-30:00	1539	1523	1140	1194	1197	1193	1192	1186

*The apparatus is calibrated under NFPA 285-19. Some values obtained during calibration are considered out of the 10% deviation allowed by versions of NFPA 285 earlier than the 2019.

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SECTION 7**TEST ASSEMBLY DESCRIPTION****Interior Cladding**

The full interior surface of the wall assembly was clad with 5/8 in. thick National Gypsum Gold Bond® Fire-Shield® gypsum board meeting the requirements of ASTM C1396. The gypsum board was fastened to the wall framing with #6 x 1-1/4 in. long, bugle head, self-drilling screws with a nominal spacing of 8 in. around the board perimeter and 12 in. in the field. Drywall orientation on the burn floor consisted of four pieces of gypsum board fastened to the core wall, with the run edge running parallel with the framing and the cut edge perpendicular to the framing. Drywall orientation on the second floor consisted of vertically oriented boards with the run edge running parallel with the framing and the cut edge perpendicular to the framing. Drywall orientation for the areas above the top support angle and below the bottom support angle consisted of boards that were oriented with the run edge perpendicular with the framing. All joints were taped with USG Sheetrock® Brand paper joint tape and spackled with USG Sheetrock® Brand joint compound. All fastener heads were spackled with USG Sheetrock® Brand joint compound.

Framing

The core wall consisted of 18 ft. (5,486mm) long, 3-5/8 in. (92mm) deep, 20 gauge galvanized steel studs fastened to 14 ft. (4,267mm) long, 3-5/8 in. (92mm) deep, 20 gauge galvanized steel track. Two studs were located at the edges of the assembly with an additional stud located on the assembly centerline. Two additional 18 ft. (5,486mm) long, 3-5/8 in. (92mm) deep, 20 gauge galvanized steel studs were located 45 in. (1,145mm) from the edges of the assembly and formed the window opening jambs. The studs were connected to the track with one #6 x 1/2 in. long self-drilling, pan head fastener per stud flange.

Framing Insulation

ROCKWOOL™ COMFORTBATT® R15 (3-1/2 in. x 16-1/4 in. x 48 in.) was placed in the stud cavities. The insulation was held in place with 4" insulation pins and washers spaced every 24 in.

Window Opening

A 78 in. (1981mm) wide x 30 in. (762mm) tall window opening was made from 20 gauge galvanized steel track. The opening was centered on the vertical centerline of the wall assembly with the finished sill located 30 in. above the first story floor line. The steel track sections were mechanically fastened with #6 x 1/2 in. long self-drilling, pan head fasteners at each corner. Upon completion of the exterior cladding 2mm thick aluminum window flashing was installed around the perimeter of the window opening. The flashing was 6 in. (150mm) deep with a 2 in. (50mm) leg bent at 90 degrees. The flashing was fastened 8 in. (203mm) on center with the 2 in. leg covered the face of the exterior cladding

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SECTION 7 (CONTINUED)

TEST ASSEMBLY DESCRIPTION

Exterior Cladding

The panels were 4mm thick ALCOPANEL FR panels with a rivetted 15/32 in. (12mm) x 15/32 in. (12mm) angled aluminum perimeter extrusion. The panels were fastened with #6 x 1/2 in. long self-drilling, pan head fasteners 12 in. (305mm) on center at stud locations maintaining a 15mm gap vertical and horizontal gap between panels. Upon completion of the cladding a continuous horizontal joint was located immediately above the top of the window opening. Three additional horizontal joints were located every 37-3/4in. (959mm) above the first joint. A continuous vertical joint was centered on the assembly centerline with two additional vertical joints located 39 in. (990mm) to the left and right of the centerline. The width of the air space from the back of the panels to the face of the stud cavity insulation was 1 in. (26mm).

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SECTION 8

TEST OBSERVATIONS

TIME (Min:Sec)	OBSERVATIONS
00:00	Ignition of room burner.
01:10	Window header flashing begins to warp.
01:40	Smoke emits from behind window header flashing.
02:00	Interior gypsum paper ignites.
05:00	Ignition of window opening burner.
08:00	Panel on first row, third from the right edge of the assembly begins to warp.
10:26	Paint on the first row of panels turns from blue to black.
12:49	Window header flashing starts to melt.
14:20	Paint on second row panels turns from blue to black.
20:00	Ignition of the exterior face of the assembly at the center joint directly above window header.
21:40	Core starts to drip from the first row of panels.
23:32	Flames emitting from the surface of the exterior face of the assembly reached a height of 4 ft. above the top of the window opening in the center joint.
24:55	Front and back panel skin on the panel left of the assembly centerline above the window opening burns through.
27:00	Large amount of core drops out from the panel right of the assembly centerline above the window opening.
28:00	Front and back panel skin on the panel right of the assembly centerline above the window opening burns through.
29:00	Flames emitting from the surface of the exterior face of the assembly reached a height of 5 ft. above the window opening.
30:00	Burners extinguished. Test concluded.

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SECTION 9

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 limit.	PASS
TC's 18-19, 28, and 31-40 (1000°F limit)	TC's 18-19, 28, and 31-40 did not exceed their 1000°F limit.	PASS
TC's 49-54 (500°F above ambient)	TC's 49-54 did not exceed 500°F above their ambient temperatures.	PASS