

ARCONIC ARCHITECTURAL PRODUCTS TEST REPORT

SCOPE OF WORK

NFPA 285-2019, FIRE TEST FOR EVALUATION OF FIRE PROPAGATION CHARACTERISTICS
WALL ASSEMBLY CONTAINING 3 MM THICK BONDED SHEET PANELS

REPORT NUMBER

G104231720SAT-002 R3

TEST DATE

01/10/20

ISSUE DATE

01/30/20

REVISED DATE

10/31/22

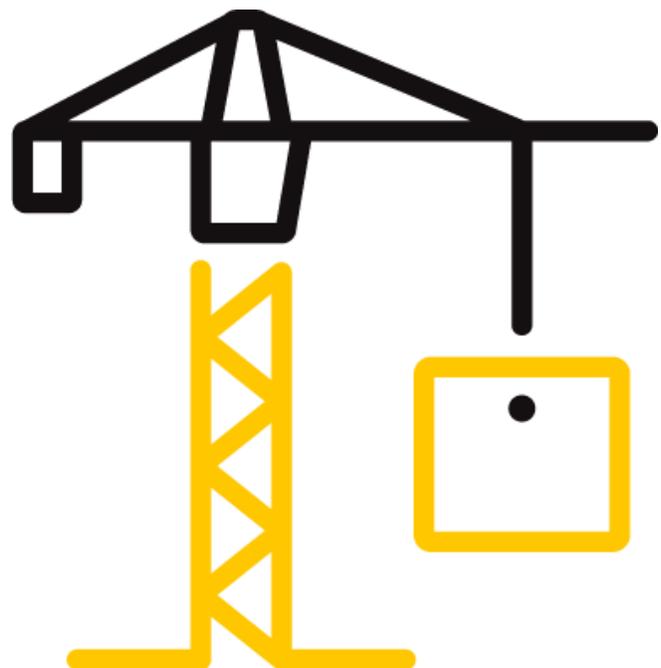
PAGES

51

DOCUMENT CONTROL NUMBER

GFT-OP-10c (09/29/20)

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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

REPORT ISSUED TO

ARCONIC ARCHITECTURAL PRODUCTS

50 Industrial Drive
Eastman, GA 31023

SECTION 1

SCOPE

Intertek Testing Services NA, Inc. dba Intertek Building & Construction (B&C) was contracted by Arconic Architectural Products, 50 Industrial Drive, Eastman, GA 31023 to perform testing in accordance with NFPA 285, *Standard Fire Test Methods for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing wall assemblies, dated January 2019*, on their 3mm thick bonded sheet panels. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek Testing Services NA, Inc. test facility in Elmendorf, TX.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens (where required by Certification or Accreditation bodies), or other pertinent project documentation, will be retained for the entire test record retention period.

SECTION 2

SUMMARY OF 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:	Emmanuel Ogoe	REVIEWED BY:	Herbert W. Stansberry II
TITLE:	Project Engineer – Fire Resistance	TITLE:	Program Manager, Building & Construction
SIGNATURE:	<i>Signature on File</i>	SIGNATURE:	<i>Signature on File</i>
DATE:	01/29/20	DATE:	01/30/20

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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

SECTION 3

TEST METHOD(S)

The specimen 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

Test samples were provided by the client. The specimens were selected by Intertek B&C personnel. The specimens were witnessed during production and tagged prior to shipment on 11/19/19, (Reference Intertek B&C Test Specimen Selection Report No. K3682.03-103-15, dated 11/19/19).

The test samples were received by the test facility on 01/08/20 in good condition and were assigned Intertek Sample ID No. SAT2001080836-001.

SECTION 5

EQUIPMENT

ASSET #	DESCRIPTION	MODEL	CAL DUE DATE
99LE006	Data Acquisition Unit	Yokogawa	03/22/20
10340409	Thermo/Hygrometer	Omega	07/31/20
181512638	Stopwatch	Fisher Scientific	08/10/20

SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Amanda Woodard	Arconic
Trey Jones	Arconic
Philip Casso	Intertek B&C
Emmanuel Ogoe	Intertek B&C

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

SECTION 7

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 24-gauge Type K was used on exterior façade and combustible core space. The window burner was positioned in the center of the opening and 4 in. off the exterior face of the wall assembly. Testing was performed on 01/10/2019 in accordance with NFPA 285 test method. Ambient conditions were 72.5°F and 76.3% relative humidity. 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 10:54 AM with the burners on for 30 minutes. All observations are recorded in the table located in Section 8.

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 with propane gas as the fuel source and the window burner placed 4 inches from the exterior surface of the assembly and vertically centred on the window opening. 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 6.3 shows a list of the calibrated equipment used for 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	16.2	0.0	1.3	0.9	1.3
5:00-10:00	16.2	5.9	2.5	1.9	1.8
10:00-15:00	16.2	6.7	2.9	2.2	2.2
15:00-20:00	17.2	7.6	3.8	2.8	3.1
20:00-25:00	17.1	8.5	4.5	3.2	3.4
25:00-30:00	17.7	8.6	4.7	3.6	3.4

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	1098	1082	556	711	660	610	500	489
5:00-10:00	1331	1332	924	971	927	886	749	734
10:00-15:00	1388	1398	1002	1020	977	938	805	777
15:00-20:00	1519	1538	1125	1122	1078	1029	900	880

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Average Time Temperature Values for Calibration (continued)								
20:00-25:00	1559	1598	1218	1249	1159	1090	971	940
25:00-30:00	1618	1686	1271	1310	1241	1158	1056	1005

SECTION 8

TEST SPECIMEN DESCRIPTION

Interior Cladding

The interior surface of the wall assembly was clad with 4 ft × 10 ft × 5/8 in. thick American Gypsum TYPE X 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. The joints and fastener heads received a Level 2 finish using USG Sheetrock® Brand paper joint tape and USG Sheetrock® Brand joint compound.

Framing

The core wall consisted of 18 ft. long, 6 in. deep, 18 GA galvanized steel studs spaced 16 in. oc fastened to 14 ft. long, 6 in. deep, 18 GA galvanized steel track as shown in Section 14. The studs were connected to the track with one #6 x 1/2 in. long self-drilling, pan head fastener per stud flange. Johns Manville MinWool® Safing pieces with a nominal density of 4.0 pcf were installed per the manufacturer’s installation instructions to fit into each stud cavity placed at the second story floor line. The safing length dimensions were no less than the apparatus floor slab thickness of 8 in.

Exterior Sheathing

4 ft × 10 ft × 1/2 in. thick DensGlass Gold exterior gypsum sheathing was placed horizontally across the full exterior surface of the assembly. The gypsum sheathing 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.

Weather Resistant Barrier

Wrap Shield SA® water resistive self-adhesive air barrier was applied directly to the exterior of the Exterior Sheathing, with a minimum 4 in. overlap at all seams.

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Zee Girts

Closure angle pieces 16 GA, galvanized steel, “double-zee” closure girt were installed Horizontally from the base of the floor to the top edge of the base wall using #8 × 1 ¾ in. long self-drilling screws.

Exterior Insulation

2-inch Rockwool CAVITYROCK[®] Insulation at 4.3 pcf was then applied in the cavities between girts at a friction fit.

Exterior Panels

Arconic 3mm Pre-painted Bonded Sheet AS3000B panels (composed of two nominal 1.5mm aluminum skins) containing Arconic’s proprietary bonding layer, fabricated into a rout and return rainscreen system with ½ in. joints. 3mm Pre-painted Bonded Sheet AS3000B spline pieces were used to cover the joint. Horizontal joints extended along the full width of the wall, with the first located 2-1/2 ft. above the top of the window opening. The vertical joint extended upward the full height of the wall from the top of the window opening and was centered along the window opening’s center line. Both horizontal and vertical joints were in compliance with NFPA 285-2019 joint requirements.

Window Detail

A 78 in. × 30 in. window opening was framed out in the center of the wall, 40 in. from the lab frame, 30 in. above the first story floor, using 18 GA, 6 in. deep track. The opening was then flashed using .040 in. aluminum flashing attached with 5/16 in. hex head, self-drilling fasteners. Aluminum L-flashing was applied on the exterior sheathing around the window frame with a 2 in leg up the interior sheathing. Flashing overlapped from the outside 2 inches.

*See Section 14 for assembly description drawings:

SECTION 9

TEST OBSERVATIONS

TIME (Min:Sec)	OBSERVATIONS
00:00	Ignition of room burner. Test started @ 10:54 A.M.
1:16	Flashing around window warping
1:30	Flames exiting window
5:00	Window burner lit
6:30	Smoking from horizontal joints
10:00	Panels above window starting to char
16:00	Flaming-vertical gap, core exposed in panels above window

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

TEST OBSERVATIONS (Continued)	
16:55	Flashing falling apart, breaking up
18:00	2 nd row middle panels skin burning off
21:00	Flaming behind panels above window opening
30:00	Test end

SECOND FLOOR OBSERVATIONS

TIME (Min:Sec)	OBSERVATIONS
00:00	Ignition of room burner. Test started @ 10:54 A.M.
1:00	Smoke rising near left-hand corner
5:00	Smoking continues – room filled with smoke
7:00	Discoloration noticeable on wall surface, left-hand side
13:00	Smoke rising along whole length of wall surface
22:00	Smoking continues, more discoloration visible
30:00	Test end

SECTION 10

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 (750°F limit)	TC's 18-19, 28, and 31-40 did not exceed their 750°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

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

SECTION 11

CONCLUSION

The Arconic wall system containing 3mm Pre-painted Bonded Sheet AS3000B panels **met** the conditions of acceptance outlined in **NFPA 285-19**, STANDARD FIRE TEST METHOD FOR EVALUATION OF FIRE PROPAGATION CHARACTERISTICS OF EXTERIOR WALL ASSEMBLIES CONTAINING COMBUSTIBLE COMPONENTS, dated November 2018.

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

SECTION 12 PHOTOGRAPHS

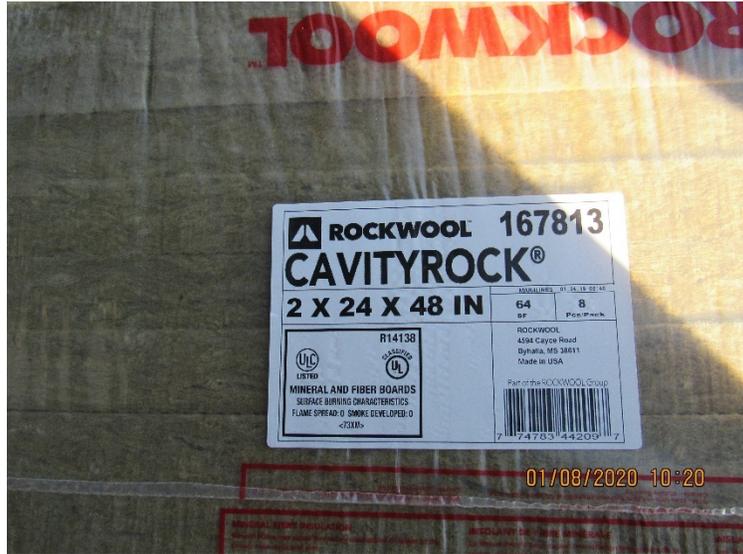


Photo No. 1
Mineral Wool

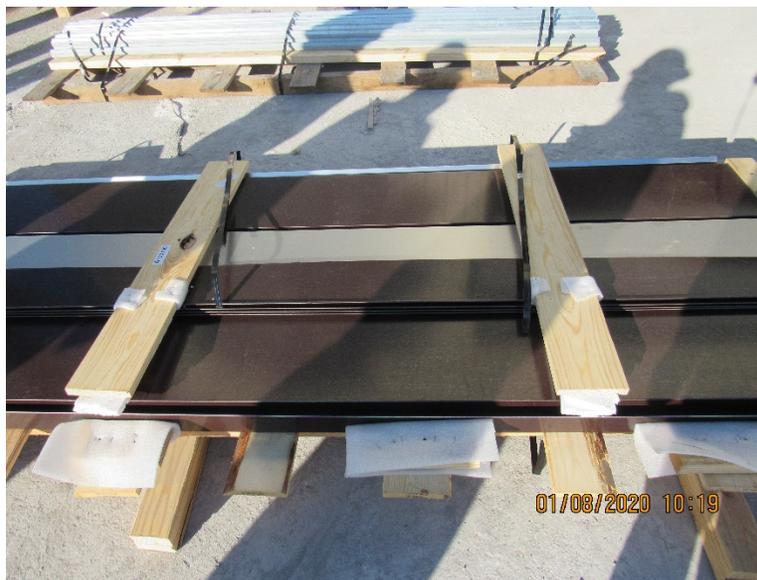


Photo No. 2
Flashing

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20



Photo No. 3
Z-girts



Photo No. 4
Exterior Panels

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

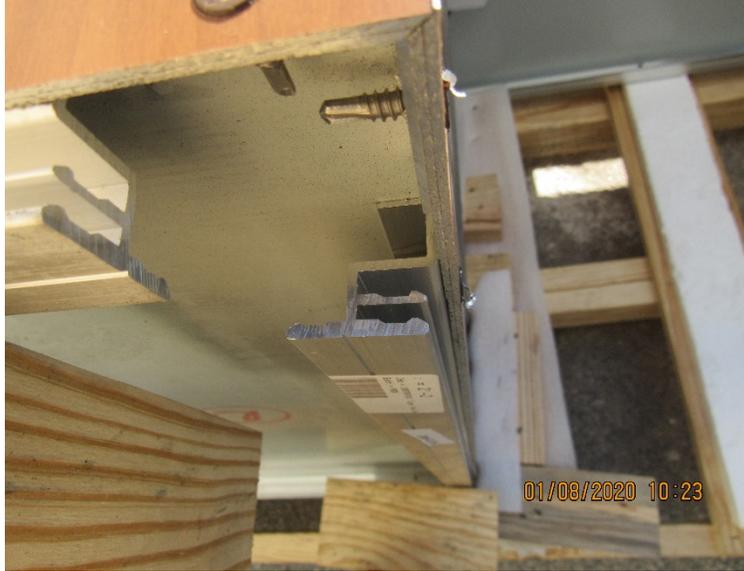


Photo No. 5

Panel Attachment system



Photo No. 6

Weather Barrier Installed

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20



Photo No. 7
Insulation Installation



Photo No. 8
Insulation thickness

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20



Photo No. 9
Panel Installation

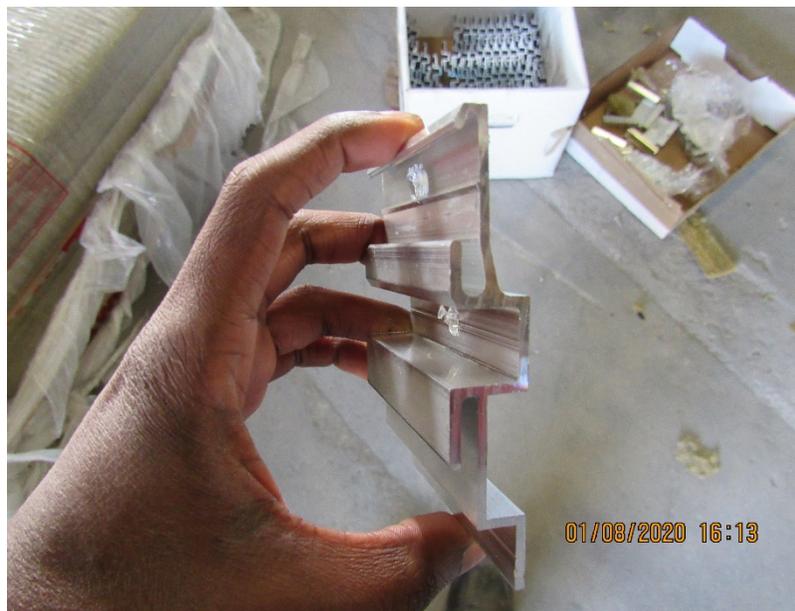


Photo No. 10
Panel Clips

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20



Photo No. 11
Panel Assembly Side-view



Photo No. 12
Completed Assembly

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20



Photo No. 13
Pre-test Inside Furnace



Photo No. 14
Flashing Installed

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

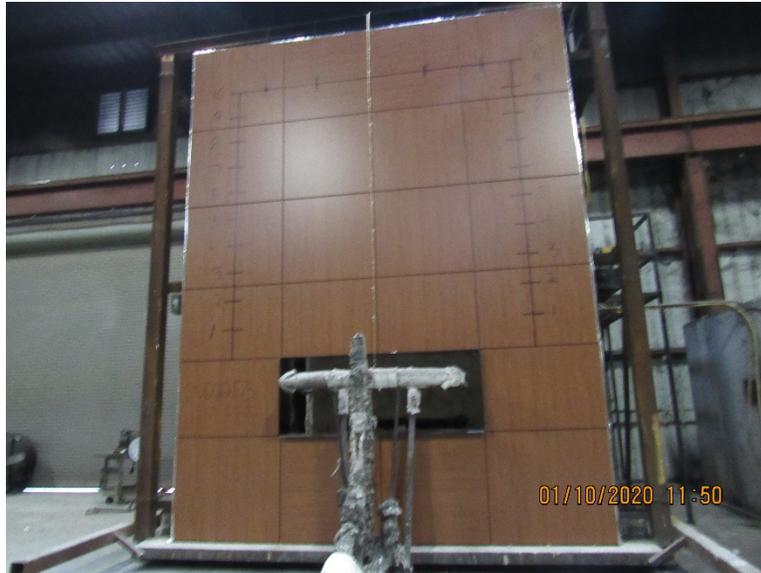


Photo No. 15
Test Setup



Photo No. 16
Start of Test

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20



Photo No. 17
Flashing Warping



Photo No. 18
Window Burner Ignited

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20



Photo No. 19
Panel Burning



Photo No. 20
Panel Opening

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20



Photo No. 21
Test Concluded



Photo No. 22
Post Test

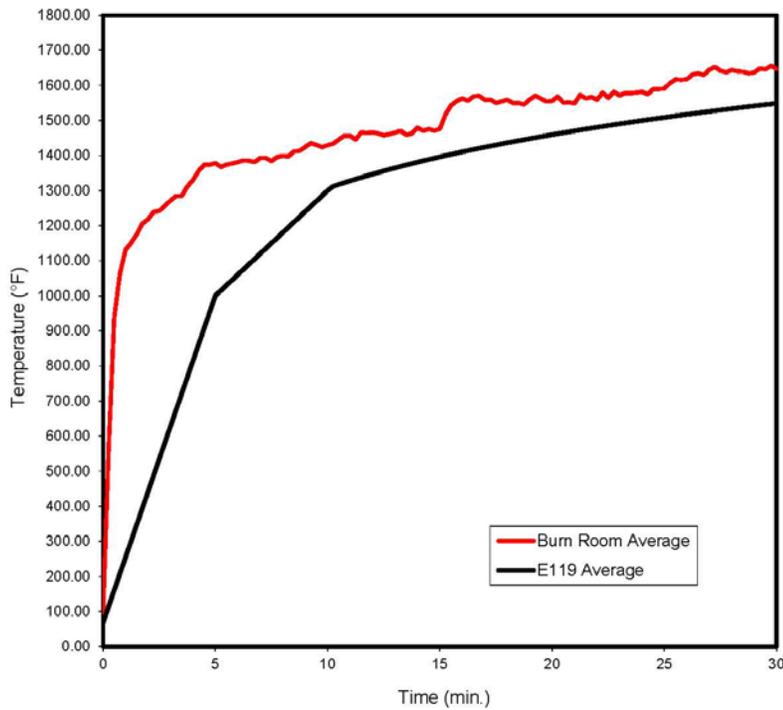
TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

SECTION 13 GRAPHS

Arconic
Project No. G104231720SAT-002
January 10, 2020
Burn Room Average

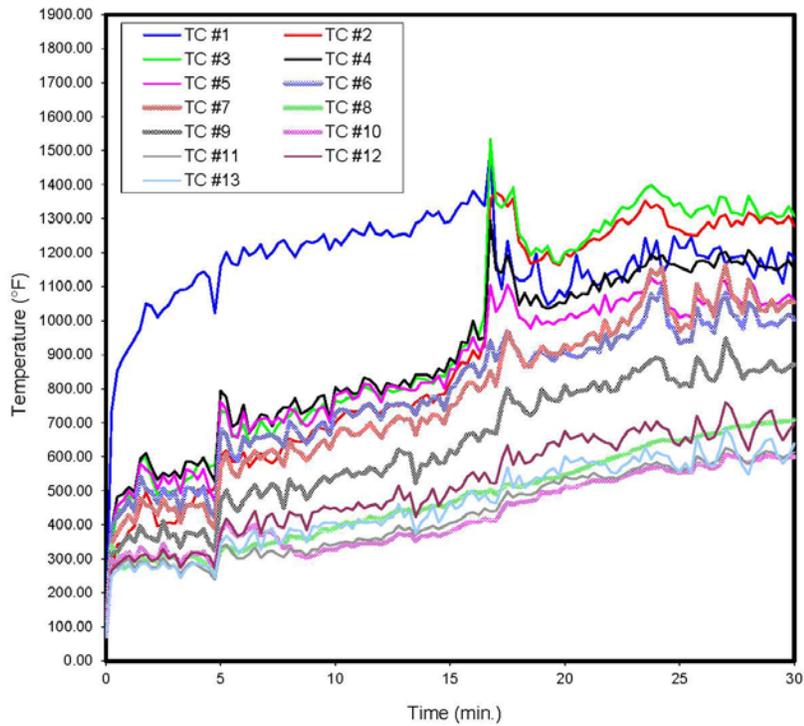


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
Vertical Face
TC 1-13

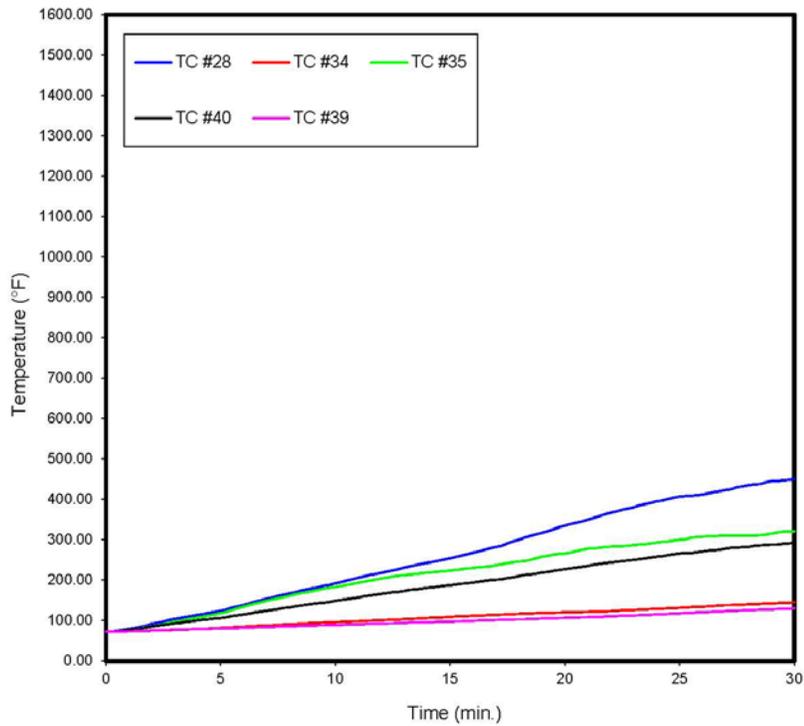


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
10-ft Air Cavity
TC 28, 34, 35, 40, 39

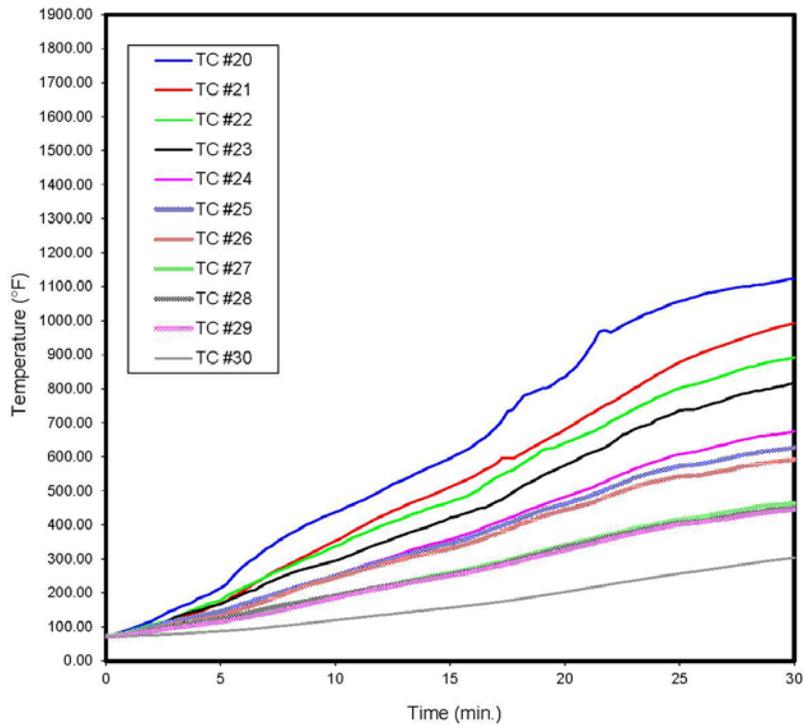


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
Vertical Air Cavity
TC 20-30

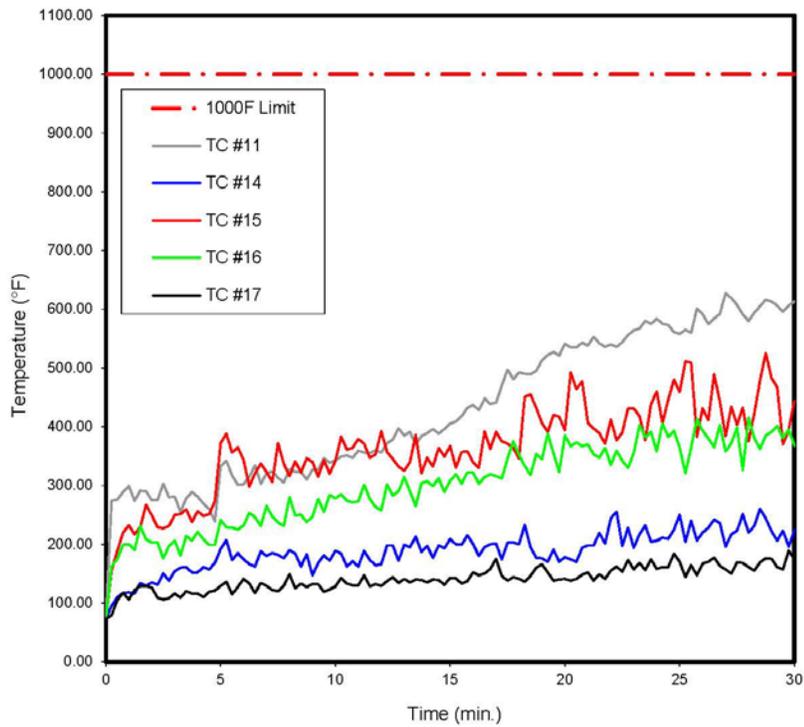


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
10-ft Front Face
TC 11, 14-17

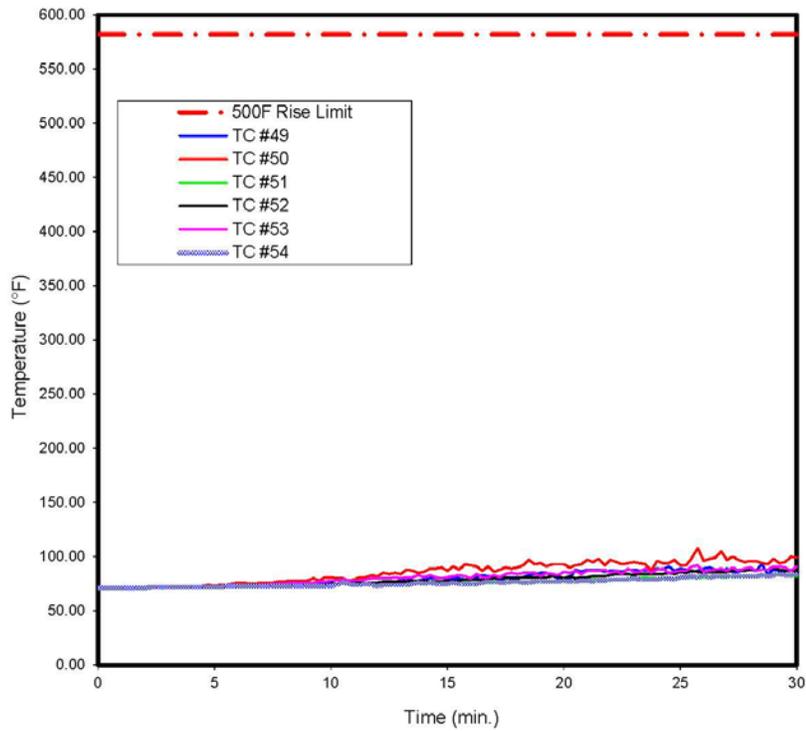


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
2nd Floor, 1-in from wall
TC 49-54

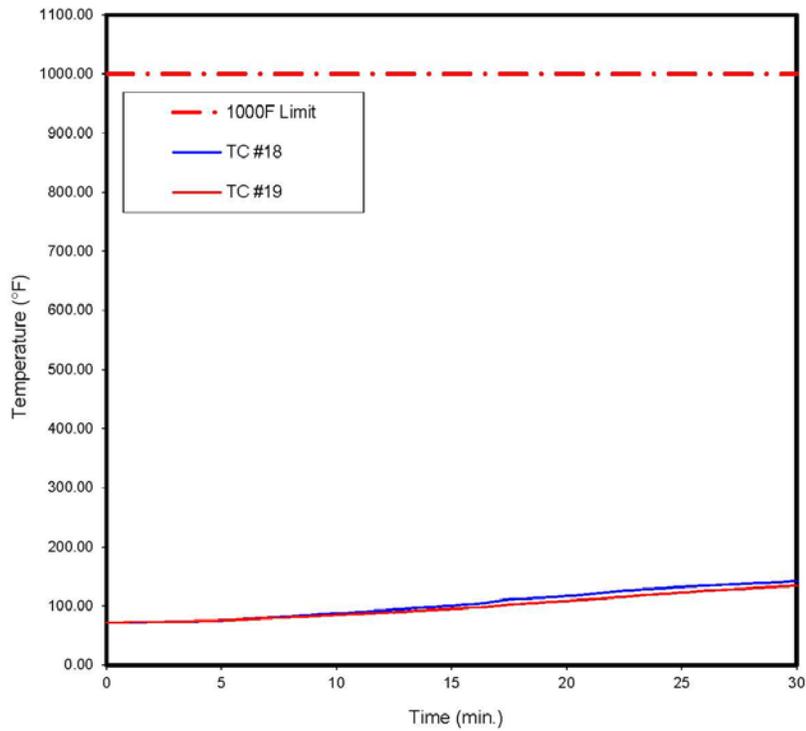


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
Air Cavity
TC 18, 19

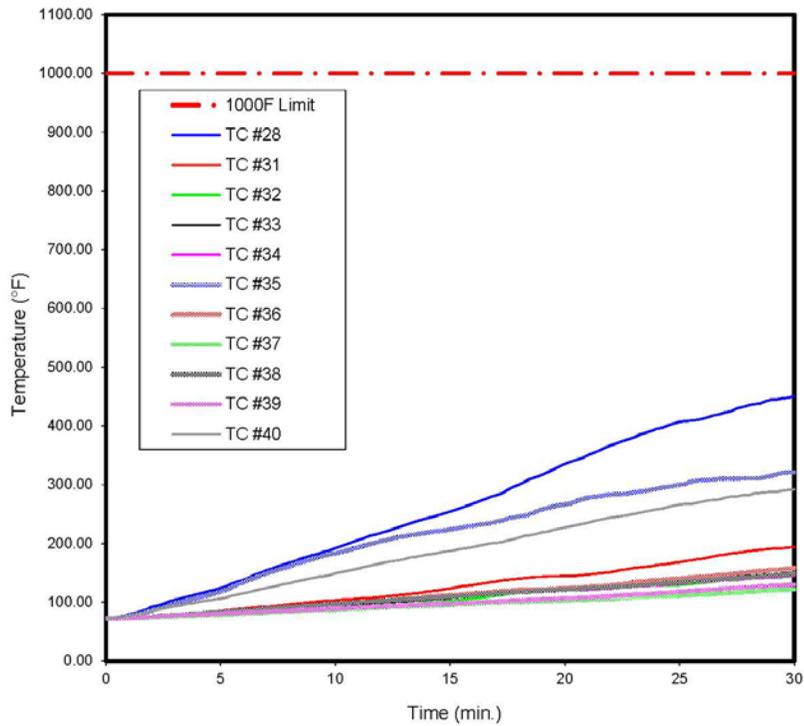


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
Air Cavity
TC 28, 31-40

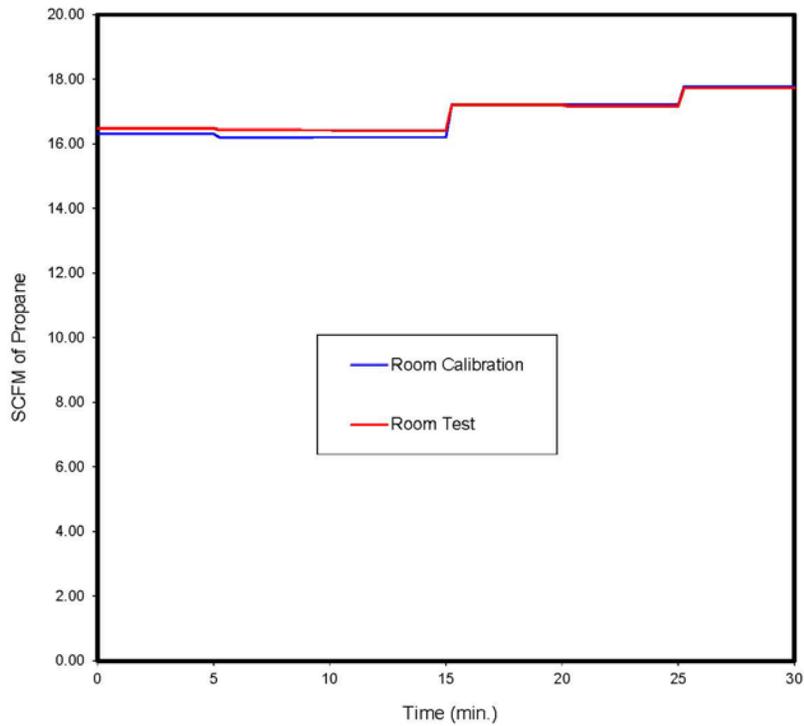


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
Room Burner Flow Rates

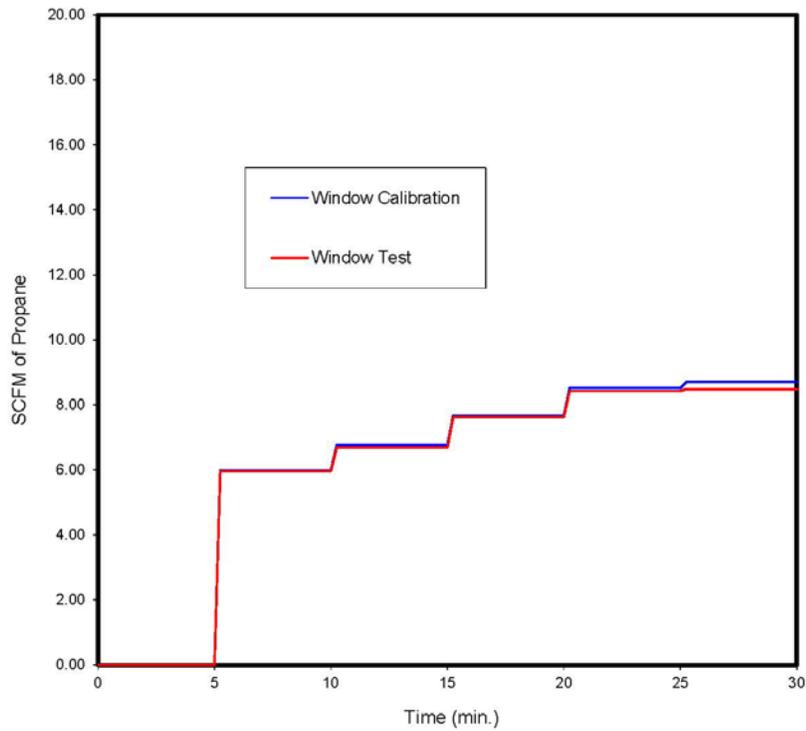


TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic
Project No. G104231720SAT-002
January 10, 2020
Window Burner Flow Rates



TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

SECTION 14 TABULAR DATA

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	Burn Room (°F)	E119 Average (°F)	Pass/Fail													
			TC #1 (°F)	TC #2 (°F)	TC #3 (°F)	TC #4 (°F)	TC #5 (°F)	TC #6 (°F)	TC #7 (°F)	TC #8 (°F)	TC #9 (°F)	TC #10 (°F)	TC #11 (°F)	TC #12 (°F)	TC #13 (°F)	
0.00	93	68	77	74	74	73	73	73	73	73	73	73	73	73	74	74
0.25	565	115	734	262	336	389	390	398	348	340	317	297	274	265	249	
0.50	938	161	853	343	447	483	456	425	377	316	321	289	276	284	266	
0.75	1062	208	891	348	442	491	470	442	403	271	348	313	289	297	280	
1.00	1131	254	918	381	485	511	499	472	428	284	368	319	299	310	283	
1.25	1151	301	946	395	476	496	479	439	406	277	351	291	274	291	261	
1.50	1175	348	977	454	586	593	580	542	479	309	396	334	291	309	285	
1.75	1206	394	1050	496	600	610	563	504	458	295	366	320	290	314	288	
2.00	1218	441	1042	457	536	567	549	496	453	296	361	304	275	292	269	
2.25	1239	487	1010	395	488	532	505	464	429	289	352	299	275	300	271	
2.50	1242	534	1033	401	502	553	543	508	475	324	412	345	303	328	291	
2.75	1256	581	1047	407	494	542	520	478	442	303	362	309	280	300	270	
3.00	1271	627	1080	403	499	558	545	497	451	304	373	312	281	313	281	
3.25	1284	674	1090	425	512	536	493	440	406	279	334	284	255	274	244	
3.50	1284	720	1092	458	532	587	562	511	457	303	378	311	278	298	271	
3.75	1311	767	1105	459	540	585	557	508	459	310	375	318	289	319	285	
4.00	1329	814	1134	501	575	574	533	488	454	300	367	313	281	319	286	
4.25	1355	860	1145	511	596	597	563	513	461	292	386	320	269	313	280	
4.50	1373	907	1127	494	570	560	507	445	412	273	346	294	260	309	277	
4.75	1374	953	1022	509	576	528	467	420	388	270	326	276	239	272	246	
5.00	1378	1000	1161	602	733	794	762	682	568	325	470	378	333	377	346	
5.25	1367	1015	1201	618	732	774	738	664	609	337	501	410	342	419	367	
5.50	1374	1030	1168	587	658	688	664	603	556	331	460	383	317	395	351	
5.75	1377	1045	1163	585	666	700	656	589	540	317	440	365	301	366	320	
6.00	1381	1060	1216	613	696	753	731	658	585	324	470	372	302	376	329	
6.25	1386	1075	1191	569	640	670	672	632	593	334	493	388	315	411	361	
6.50	1385	1090	1202	592	660	694	700	658	617	346	518	399	334	441	385	
6.75	1381	1105	1224	610	706	725	711	655	594	335	480	369	303	375	326	
7.00	1393	1120	1184	590	683	721	713	662	612	343	500	379	320	422	382	
7.25	1393	1135	1200	581	660	690	698	664	621	347	520	379	324	433	389	
7.50	1384	1150	1227	599	694	730	715	653	605	352	506	354	313	396	344	
7.75	1395	1165	1237	636	708	745	701	629	572	340	450	331	305	391	356	
8.00	1399	1180	1211	653	719	745	741	703	645	366	533	337	327	438	388	
8.25	1397	1195	1187	645	742	772	733	684	619	364	504	315	323	428	384	
8.50	1411	1210	1220	644	696	727	704	658	610	364	514	309	323	429	383	
8.75	1413	1225	1233	647	719	735	690	638	589	359	475	303	310	385	349	
9.00	1424	1240	1228	675	739	747	704	661	608	362	502	309	327	436	394	
9.25	1435	1255	1236	686	735	774	739	692	634	375	523	316	327	440	393	
9.50	1430	1270	1253	682	756	781	747	701	649	388	540	327	346	454	407	
9.75	1424	1285	1209	675	712	711	703	665	623	382	526	327	339	448	405	
10.00	1429	1300	1240	701	766	804	782	729	662	392	544	327	343	450	407	
10.25	1434	1312	1223	719	760	790	787	739	683	400	550	336	349	439	391	
10.50	1445	1317	1246	735	772	803	795	735	681	407	563	343	351	451	403	
10.75	1456	1323	1269	733	775	786	770	719	663	402	541	335	347	444	389	
11.00	1456	1328	1258	732	786	787	777	728	666	409	554	344	359	465	418	
11.25	1445	1333	1252	746	806	833	814	748	678	411	550	345	356	449	405	
11.50	1466	1337	1287	749	800	827	811	756	699	423	568	345	355	456	407	
11.75	1464	1342	1256	732	788	810	789	734	677	419	560	347	360	460	410	
12.00	1466	1347	1252	730	773	783	760	709	655	415	543	343	356	446	398	
12.25	1463	1351	1266	743	799	817	806	755	689	424	569	351	372	467	419	
12.50	1458	1356	1247	753	790	810	808	750	703	434	581	359	378	474	422	

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	Burn Room (°F)	E119 Average (°F)	TC #1 - TC #11											Pass/Fail	
			TC #1 (°F)	TC #2 (°F)	TC #3 (°F)	TC #4 (°F)	TC #5 (°F)	TC #6 (°F)	TC #7 (°F)	TC #8 (°F)	TC #9 (°F)	TC #10 (°F)	TC #11 (°F)	TC #12 (°F)	TC #13 (°F)
12.75	1461	1360	1252	749	796	805	802	757	718	443	622	375	397	515	460
13.00	1465	1364	1256	759	800	826	801	754	708	443	609	369	385	473	424
13.25	1471	1369	1248	742	798	806	795	747	711	445	610	372	391	493	439
13.50	1459	1373	1286	761	832	842	796	724	665	430	523	354	370	423	375
13.75	1462	1377	1295	772	830	841	818	766	714	445	577	367	384	461	409
14.00	1479	1381	1321	782	826	841	817	753	700	448	575	366	389	474	424
14.25	1470	1385	1307	759	814	830	820	776	725	456	608	374	396	506	457
14.50	1475	1388	1320	782	838	859	837	774	719	456	581	366	388	456	407
14.75	1471	1392	1288	784	836	849	801	739	698	453	583	373	396	482	434
15.00	1475	1396	1292	821	867	889	857	801	749	466	620	380	405	512	467
15.25	1517	1400	1322	853	884	875	856	812	754	469	608	387	409	498	447
15.50	1543	1403	1346	878	921	938	911	846	785	482	642	396	418	511	459
15.75	1555	1407	1344	873	932	936	913	866	816	494	665	406	432	541	491
16.00	1563	1410	1382	912	989	1000	951	872	817	497	669	409	437	555	500
16.25	1556	1414	1358	888	957	945	911	836	795	494	647	409	428	529	471
16.50	1569	1417	1337	942	1018	950	922	864	810	495	678	418	448	554	490
16.75	1570	1420	1502	1355	1533	1295	1105	940	852	502	673	413	439	524	467
17.00	1559	1424	1171	1377	1347	1150	1026	882	810	490	669	413	441	523	463
17.25	1560	1427	1093	1365	1332	1141	1054	927	896	504	750	441	470	591	512
17.50	1550	1430	1235	1336	1358	1193	1106	971	966	520	800	466	497	633	568
17.75	1554	1433	1133	1359	1391	1134	1070	931	930	516	760	459	481	576	509
18.00	1559	1436	1119	1231	1255	1047	1011	899	906	511	759	466	492	615	544
18.25	1550	1439	1119	1211	1233	1082	1001	865	867	514	734	467	490	580	509
18.50	1550	1442	1133	1168	1191	1046	978	878	866	523	722	470	489	586	523
18.75	1546	1445	1197	1174	1214	1076	1013	907	891	523	738	474	495	606	539
19.00	1560	1448	1088	1181	1201	1043	989	907	924	534	799	496	513	604	535
19.25	1571	1451	1046	1203	1219	1036	998	898	905	537	773	493	522	637	557
19.50	1562	1454	1060	1171	1175	1042	989	883	902	537	766	497	527	644	566
19.75	1554	1457	1089	1163	1169	1053	1003	902	901	539	765	497	521	632	547
20.00	1556	1459	1071	1197	1200	1050	1003	908	929	548	809	513	541	675	601
20.25	1568	1462	1102	1188	1209	1084	1021	898	914	552	781	510	535	652	584
20.50	1550	1465	1193	1206	1206	1067	1008	894	930	557	792	512	535	660	589
20.75	1552	1467	1125	1213	1227	1080	1021	896	929	565	795	518	543	666	597
21.00	1548	1470	1148	1231	1241	1079	1027	917	955	570	798	524	538	642	580
21.25	1573	1473	1106	1241	1267	1116	1045	919	965	580	819	531	553	665	587
21.50	1563	1475	1106	1237	1259	1086	1017	909	939	583	795	529	542	652	575
21.75	1567	1478	1126	1249	1294	1140	1076	960	1001	587	820	530	536	642	579
22.00	1559	1480	1142	1262	1281	1101	1026	918	955	595	793	529	540	637	555
22.25	1579	1483	1148	1290	1313	1123	1057	948	969	600	796	532	536	619	552
22.50	1565	1485	1115	1299	1334	1129	1066	957	1006	605	834	540	544	653	571
22.75	1582	1488	1166	1284	1328	1113	1057	949	989	610	831	546	556	676	582
23.00	1571	1490	1192	1298	1340	1141	1080	974	1028	620	858	556	564	685	601
23.25	1578	1493	1145	1320	1365	1156	1083	982	1045	626	851	554	567	671	586
23.50	1578	1495	1244	1353	1388	1160	1086	1010	1088	630	868	564	580	701	628
23.75	1579	1497	1181	1331	1398	1194	1125	1079	1149	641	883	567	575	677	594
24.00	1582	1499	1235	1341	1385	1181	1111	1059	1134	645	891	569	584	703	614
24.25	1575	1502	1138	1327	1367	1192	1112	1105	1155	650	884	570	575	687	605
24.50	1589	1504	1168	1278	1361	1167	1039	987	1027	647	827	559	573	679	601
24.75	1589	1506	1249	1272	1337	1166	1033	975	1017	648	829	557	561	640	570
25.00	1591	1508	1215	1267	1346	1157	1009	934	968	647	809	553	558	634	557
25.25	1606	1511	1215	1255	1318	1150	1017	941	988	652	816	556	565	658	581



Total Quality. Assured.

16015 Shady Falls Road
Elmendorf, Texas 78112

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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	Burn Room (°F)	E119 Average (°F)	TC #1 - TC #10										Pass/Fail		
			TC #1 (°F)	TC #2 (°F)	TC #3 (°F)	TC #4 (°F)	TC #5 (°F)	TC #6 (°F)	TC #7 (°F)	TC #8 (°F)	TC #9 (°F)	TC #10 (°F)	TC #11 (°F)	TC #12 (°F)	TC #13 (°F)
25.50	1617	1513	1245	1252	1304	1143	1012	941	979	652	807	554	560	640	555
25.75	1616	1515	1192	1250	1325	1174	1067	1037	1108	658	893	580	601	720	656
26.00	1617	1517	1190	1271	1330	1177	1048	989	1064	665	868	576	591	681	609
26.25	1631	1519	1183	1289	1338	1172	1054	994	1056	666	830	568	575	650	577
26.50	1634	1521	1211	1271	1310	1156	1032	964	1013	669	823	567	584	658	572
26.75	1629	1523	1217	1305	1364	1197	1115	1045	1102	669	855	575	592	695	622
27.00	1644	1525	1166	1312	1360	1202	1116	1082	1164	681	947	607	627	760	682
27.25	1653	1527	1185	1278	1318	1172	1068	1021	1080	687	902	602	619	742	660
27.50	1641	1529	1187	1294	1317	1175	1066	1010	1057	690	876	600	607	697	609
27.75	1637	1531	1191	1283	1309	1165	1043	977	1022	690	830	585	591	654	572
28.00	1643	1533	1160	1318	1366	1208	1122	1053	1120	690	852	583	580	618	548
28.25	1640	1535	1124	1310	1336	1187	1098	1037	1076	698	855	590	594	677	602
28.50	1639	1537	1183	1288	1301	1160	1045	986	1031	698	849	591	605	706	620
28.75	1634	1539	1150	1303	1310	1157	1049	985	1028	699	865	604	616	727	647
29.00	1637	1541	1215	1300	1318	1156	1050	995	1060	700	881	601	613	736	653
29.25	1648	1543	1151	1287	1305	1148	1048	985	1028	703	855	599	606	679	606
29.50	1645	1545	1110	1288	1308	1162	1063	1004	1045	704	850	594	596	649	580
29.75	1655	1547	1200	1308	1336	1177	1077	1018	1057	706	865	598	606	676	602
30.00	1646	1549	1182	1278	1308	1151	1059	1003	1053	709	871	600	613	698	639
Max Temp			1502	1377	1533	1295	1125	1105	1164	709	947	607	627	760	682
Max Allowed													1000		



Total Quality. Assured.

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Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	TC #20 (°F)	TC #21 (°F)	TC #22 (°F)	TC #23 (°F)	TC #24 (°F)	TC #25 (°F)	TC #26 (°F)	TC #27 (°F)
	TC #14 (°F)	TC #15 (°F)	TC #16 (°F)	TC #17 (°F)	TC #18 (°F)	TC #19 (°F)								
0.00	73	73	73	73	72	72	73	72	73	73	72	72	72	72
0.25	95	155	162	79	72	72	75	73	73	73	74	72	72	74
0.50	110	189	175	105	72	72	81	76	76	76	78	76	73	77
0.75	117	220	199	117	72	72	86	79	81	78	81	79	76	79
1.00	118	232	200	106	72	73	92	82	88	82	86	84	79	81
1.25	116	217	190	122	72	73	98	86	93	87	88	87	82	83
1.50	134	229	231	129	72	73	105	92	98	89	92	92	85	86
1.75	129	267	208	129	73	73	111	96	102	94	96	96	89	89
2.00	135	249	203	126	73	73	117	101	107	100	100	100	94	92
2.25	131	229	203	109	73	73	126	105	110	107	104	104	98	94
2.50	150	227	176	106	73	73	135	110	114	111	109	109	101	97
2.75	138	231	197	108	73	74	145	114	119	118	113	113	104	100
3.00	154	250	206	116	73	74	150	120	127	128	117	117	107	102
3.25	160	251	181	109	73	74	159	125	133	134	121	121	110	104
3.50	161	259	214	120	74	74	165	131	142	139	124	124	113	107
3.75	152	238	206	116	74	74	171	136	148	144	128	128	116	109
4.00	152	256	221	116	74	75	183	143	155	147	132	132	119	112
4.25	161	248	208	110	75	75	189	148	161	151	136	135	122	115
4.50	157	251	199	119	75	75	195	156	169	159	140	139	125	117
4.75	168	273	199	121	75	75	205	162	173	163	143	142	129	119
5.00	192	372	241	129	75	76	214	169	178	167	146	145	131	121
5.25	207	388	229	136	76	76	225	176	190	175	151	150	136	125
5.50	173	356	228	115	76	76	245	188	200	183	158	157	144	129
5.75	185	365	225	127	77	77	262	196	207	189	163	162	148	132
6.00	174	343	232	141	78	77	279	206	215	197	169	168	155	135
6.25	166	298	253	133	78	78	292	218	223	205	174	172	159	139
6.50	162	321	246	117	79	78	302	229	231	208	180	179	165	143
6.75	188	337	231	134	79	79	317	238	239	219	186	184	171	146
7.00	180	323	265	129	80	79	330	249	248	228	191	189	177	150
7.25	185	306	247	122	81	80	339	259	257	235	196	195	183	154
7.50	182	372	237	120	81	80	353	269	264	243	202	200	190	158
7.75	176	337	231	129	82	80	362	276	270	249	207	205	196	160
8.00	190	316	280	149	82	81	373	285	278	256	213	211	203	163
8.25	184	341	249	125	83	81	381	292	285	262	218	216	209	167
8.50	162	322	250	133	84	82	390	302	293	267	224	221	216	170
8.75	183	346	238	127	84	82	401	310	301	272	229	226	221	174
9.00	147	340	247	132	85	83	407	319	307	276	234	231	226	176
9.25	168	315	277	132	86	83	416	327	314	281	238	235	230	179
9.50	181	343	255	119	86	84	424	336	321	285	242	240	235	183
9.75	172	320	284	123	87	84	430	345	330	290	247	245	239	186
10.00	189	342	278	128	87	85	437	353	337	294	252	250	245	190
10.25	184	383	285	143	88	85	443	360	342	300	257	255	250	193
10.50	162	361	274	133	88	86	453	370	353	307	264	261	255	197
10.75	171	364	271	130	89	86	459	381	362	313	270	266	259	201
11.00	162	379	273	130	90	86	467	390	368	321	275	271	264	205
11.25	189	371	301	147	90	87	473	398	375	327	281	276	269	208
11.50	173	347	277	128	91	87	483	408	383	335	286	281	274	212
11.75	164	353	263	132	92	88	491	417	389	341	291	286	279	214
12.00	166	392	258	129	92	88	500	425	397	347	296	291	282	218
12.25	198	357	302	137	93	89	509	432	403	352	301	296	287	221
12.50	198	345	283	144	94	89	520	441	409	359	307	300	291	225



Total Quality. Assured.

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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	TC #20 (°F)	TC #21 (°F)	TC #22 (°F)	TC #23 (°F)	TC #24 (°F)	TC #25 (°F)	TC #26 (°F)	TC #27 (°F)
	TC #14 (°F)	TC #15 (°F)	TC #16 (°F)	TC #17 (°F)	TC #18 (°F)	TC #19 (°F)								
12.75	172	332	290	134	94	90	526	447	414	365	312	305	295	228
13.00	199	325	314	141	95	90	533	455	421	371	319	311	300	234
13.25	195	340	290	135	96	91	541	463	428	378	325	315	305	236
13.50	213	386	265	140	97	92	550	469	434	383	330	320	309	240
13.75	187	321	304	139	97	92	558	475	439	388	334	324	312	243
14.00	197	347	307	135	98	93	566	482	447	393	340	329	316	247
14.25	177	332	299	140	98	93	573	489	452	400	344	333	319	249
14.50	198	364	312	139	99	94	580	496	457	407	349	338	323	253
14.75	193	349	289	131	100	94	588	503	461	412	352	342	326	256
15.00	209	367	308	143	100	95	595	511	467	421	357	345	330	258
15.25	200	330	319	142	101	95	605	519	474	424	362	350	334	262
15.50	199	357	303	133	102	96	613	526	478	430	368	355	339	265
15.75	215	358	322	137	103	97	621	533	485	435	373	360	344	269
16.00	200	339	322	152	103	97	632	541	494	441	379	366	349	273
16.25	180	330	303	147	104	97	645	551	502	448	385	372	354	277
16.50	195	392	314	150	105	98	656	562	518	450	393	379	361	280
16.75	200	362	319	158	107	99	670	569	527	458	400	386	368	284
17.00	201	391	316	175	108	100	686	579	539	467	406	392	373	287
17.25	174	375	312	146	110	101	705	596	547	474	412	397	380	290
17.50	203	371	346	138	111	102	733	597	556	485	419	404	386	296
17.75	203	364	375	144	112	103	739	595	561	496	424	410	392	300
18.00	200	346	352	141	112	103	763	605	573	507	431	417	401	306
18.25	233	451	333	136	112	104	781	614	584	518	439	424	406	310
18.50	195	455	318	146	113	105	786	625	595	525	446	430	413	315
18.75	177	432	353	160	114	105	794	633	604	533	451	436	418	319
19.00	176	406	345	166	114	106	801	643	619	544	458	443	425	323
19.25	170	391	388	152	115	107	803	652	624	552	464	448	430	327
19.50	191	420	355	138	115	107	813	662	626	559	470	452	434	332
19.75	170	417	323	140	116	108	827	669	633	567	476	457	439	336
20.00	178	394	385	141	117	108	835	680	641	575	482	461	444	341
20.25	174	492	367	138	117	109	850	690	647	582	487	466	447	344
20.50	170	464	373	141	118	110	866	700	654	590	494	473	452	349
20.75	194	477	367	148	119	110	886	711	661	600	499	477	457	352
21.00	198	407	370	152	120	111	911	722	669	608	505	483	462	355
21.25	198	397	353	138	121	112	936	730	674	614	511	489	466	360
21.50	219	389	347	149	122	112	968	741	684	620	520	495	474	364
21.75	201	371	364	141	123	113	973	751	692	628	526	502	481	368
22.00	244	412	335	155	124	114	966	759	704	638	535	509	486	372
22.25	255	377	359	162	125	115	975	768	713	650	542	516	493	375
22.50	197	390	342	153	126	115	985	779	721	664	550	523	499	380
22.75	228	431	330	173	126	116	994	789	730	670	555	529	504	383
23.00	194	431	355	157	127	117	1002	801	739	680	564	537	511	389
23.25	217	418	403	168	128	118	1010	809	748	687	569	542	516	393
23.50	232	377	382	156	129	119	1019	821	757	692	576	548	520	396
23.75	204	438	391	174	129	119	1024	830	764	697	581	553	525	398
24.00	206	460	358	158	130	120	1032	841	774	709	587	557	528	403
24.25	211	406	405	161	130	121	1038	849	780	715	592	561	532	406
24.50	209	446	383	161	131	121	1046	860	788	721	598	565	535	410
24.75	225	480	393	184	132	122	1052	869	796	728	604	569	539	414
25.00	250	459	364	170	132	123	1057	878	802	736	607	573	542	416
25.25	204	511	321	144	133	123	1061	885	806	738	610	574	543	417



Total Quality. Assured.

16015 Shady Falls Road
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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	TC #20 (°F)	TC #21 (°F)	TC #22 (°F)	TC #23 (°F)	TC #24 (°F)	TC #25 (°F)	TC #26 (°F)	TC #27 (°F)
	TC #14 (°F)	TC #15 (°F)	TC #16 (°F)	TC #17 (°F)	TC #18 (°F)	TC #19 (°F)								
25.50	240	509	365	164	133	124	1067	893	811	738	613	575	544	418
25.75	206	383	413	147	134	125	1071	899	814	740	615	577	545	421
26.00	220	431	393	167	134	126	1078	907	819	747	620	580	547	424
26.25	228	411	380	170	135	126	1082	912	824	752	624	583	551	427
26.50	242	489	365	177	135	127	1084	919	830	758	629	587	554	430
26.75	236	443	403	163	136	127	1088	924	835	761	633	590	557	433
27.00	196	384	358	157	136	128	1091	931	841	768	636	593	559	437
27.25	217	434	372	150	137	128	1094	936	846	775	641	597	562	439
27.50	223	403	398	169	137	129	1098	943	853	780	646	602	568	442
27.75	251	432	326	168	138	129	1100	948	858	785	650	605	572	445
28.00	220	375	415	161	138	130	1100	954	864	788	653	608	574	448
28.25	231	422	381	155	139	131	1105	960	866	793	657	610	576	451
28.50	260	479	362	169	139	131	1106	965	872	794	661	614	580	454
28.75	244	525	385	176	139	132	1108	970	876	799	662	616	581	456
29.00	222	483	391	175	140	132	1112	976	879	801	665	618	584	458
29.25	206	467	401	161	140	133	1114	980	883	806	666	620	586	460
29.50	223	370	381	157	141	133	1118	984	885	808	669	622	588	460
29.75	196	395	395	189	142	134	1122	988	888	813	671	624	589	462
30.00	224	444	368	175	142	134	1123	993	892	817	675	627	592	463
Max Temp	260	525	415	189	142	134	1123	993	892	817	675	627	592	463
Max Allowed	1000	1000	1000	1000	1000	1000								



Total Quality. Assured.

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Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	Pass/ Fail		Pass/ Fail													
	TC #28 (°F)	TC #29 (°F)	TC #30 (°F)	TC #31 (°F)	TC #32 (°F)	TC #33 (°F)	TC #34 (°F)	TC #35 (°F)	TC #36 (°F)	TC #37 (°F)	TC #38 (°F)	TC #39 (°F)	TC #40 (°F)	TC #41 (°F)		
0.00	72	72	72	72	73	73	72	72	72	72	72	72	73	87		
0.25	72	72	72	72	73	73	72	72	72	72	72	72	72	691		
0.50	74	73	73	72	73	73	72	73	72	72	72	72	73	1093		
0.75	76	74	73	73	73	73	72	74	72	72	72	72	74	1218		
1.00	79	76	73	73	73	73	73	76	73	72	73	73	76	1273		
1.25	81	79	74	74	73	73	73	78	73	73	73	73	78	1280		
1.50	84	81	75	74	74	73	74	80	74	73	74	74	80	1312		
1.75	87	84	75	75	74	74	74	83	74	73	74	74	82	1371		
2.00	92	87	76	76	75	74	75	86	75	74	75	75	85	1342		
2.25	94	89	76	76	75	74	75	88	76	74	76	75	87	1384		
2.50	97	92	78	77	75	75	75	91	76	75	77	76	89	1377		
2.75	101	95	78	78	76	75	76	94	77	75	77	76	91	1389		
3.00	104	97	79	79	76	76	76	97	77	75	78	77	93	1408		
3.25	106	99	80	79	77	76	77	99	78	76	78	77	94	1424		
3.50	109	101	81	80	77	76	78	102	79	76	79	78	97	1439		
3.75	111	103	82	81	77	77	78	105	79	76	80	78	98	1473		
4.00	114	106	83	81	78	77	79	107	80	77	80	79	100	1494		
4.25	116	108	84	82	78	78	79	110	80	77	81	79	102	1546		
4.50	119	110	85	83	79	78	80	112	81	78	82	79	103	1534		
4.75	121	112	86	84	79	79	81	115	81	78	82	80	105	1500		
5.00	124	114	87	85	80	80	81	118	82	78	83	80	106	1537		
5.25	127	117	88	86	80	80	82	121	82	79	84	81	108	1533		
5.50	132	121	89	87	81	81	83	126	83	79	84	81	111	1536		
5.75	135	124	90	88	82	82	84	130	84	80	85	81	113	1546		
6.00	138	126	92	89	82	83	85	134	85	80	86	82	115	1551		
6.25	142	129	93	90	83	84	85	138	85	81	86	82	117	1545		
6.50	147	133	95	91	84	84	86	142	86	81	87	83	120	1535		
6.75	150	136	96	92	84	85	87	145	87	81	88	83	122	1541		
7.00	154	139	98	92	85	86	88	149	88	82	89	84	124	1532		
7.25	157	142	100	93	85	87	88	152	89	83	89	84	126	1518		
7.50	161	147	102	94	86	87	89	155	89	83	90	85	128	1507		
7.75	164	150	103	95	86	88	90	158	90	84	91	85	131	1547		
8.00	167	154	105	96	87	89	90	161	91	84	92	85	132	1535		
8.25	170	158	107	97	87	90	91	165	92	84	92	86	135	1525		
8.50	174	161	109	98	88	91	92	168	93	85	93	87	137	1558		
8.75	177	165	110	99	89	91	93	170	94	85	94	87	139	1566		
9.00	180	170	112	100	89	92	94	173	94	86	94	87	141	1569		
9.25	182	173	114	101	89	93	94	176	95	86	95	88	143	1548		
9.50	186	177	116	102	90	93	95	179	96	86	96	88	144	1533		
9.75	188	181	118	102	90	94	95	181	97	87	96	89	146	1553		
10.00	192	185	120	103	91	94	96	183	97	87	97	89	149	1573		
10.25	195	188	121	104	91	95	97	185	98	88	97	89	151	1586		
10.50	199	193	123	105	92	96	97	188	99	88	98	90	153	1615		
10.75	202	196	125	105	92	96	98	191	99	89	99	90	155	1580		
11.00	206	199	127	106	92	97	98	193	100	89	100	91	157	1582		
11.25	209	203	129	107	93	97	99	196	100	89	100	91	160	1583		
11.50	213	207	131	107	93	98	100	199	101	90	101	92	162	1641		
11.75	215	210	133	108	93	99	100	201	102	90	102	92	164	1625		
12.00	218	213	135	109	94	99	101	204	103	91	102	92	166	1609		
12.25	221	216	136	110	94	100	101	206	103	91	103	93	168	1610		
12.50	224	219	138	111	95	100	102	209	104	92	104	93	170	1584		

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

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Arconic

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January 10, 2020

Time (min)	TC #28 (°F)	TC #29 (°F)	TC #30 (°F)	TC #31 (°F)	TC #32 (°F)	TC #33 (°F)	TC #34 (°F)	TC #35 (°F)	TC #36 (°F)	TC #37 (°F)	TC #38 (°F)	TC #39 (°F)	TC #40 (°F)	TC #41 (°F)
12.75	227	222	140	112	95	101	103	211	105	92	104	94	171	1598
13.00	231	226	142	113	96	101	103	212	106	92	105	94	173	1589
13.25	234	229	143	114	97	102	104	214	107	93	105	95	176	1602
13.50	237	233	146	115	97	103	105	215	107	93	106	95	177	1595
13.75	240	235	147	116	98	103	105	217	108	93	106	95	179	1599
14.00	243	238	149	118	99	104	106	218	110	94	107	96	181	1598
14.25	245	242	151	119	99	105	107	220	110	94	108	96	182	1590
14.50	248	244	153	120	100	106	107	221	111	95	108	97	184	1630
14.75	251	247	154	122	101	106	108	222	111	95	109	97	186	1614
15.00	254	250	156	123	102	107	109	224	112	95	109	97	187	1584
15.25	257	253	158	125	103	108	110	225	112	96	110	98	189	1640
15.50	261	256	160	127	104	109	110	227	113	97	111	98	191	1669
15.75	264	259	162	128	105	110	111	229	114	97	111	99	192	1693
16.00	268	263	164	129	106	110	112	230	115	97	112	99	194	1706
16.25	271	266	166	131	107	111	112	232	116	98	113	100	196	1651
16.50	275	270	168	132	108	112	113	233	116	98	114	100	198	1671
16.75	279	274	170	134	110	113	113	234	117	99	114	101	200	1705
17.00	282	277	172	135	111	113	114	237	118	99	115	101	201	1717
17.25	285	280	174	137	112	114	115	239	119	100	116	102	202	1744
17.50	291	285	177	138	114	115	115	242	119	100	116	102	205	1673
17.75	296	288	179	139	115	116	116	244	120	100	117	103	207	1683
18.00	300	292	182	140	116	117	116	246	121	100	117	103	210	1694
18.25	305	297	184	141	117	117	117	247	121	100	117	103	213	1703
18.50	310	302	187	142	118	118	118	250	121	101	118	104	214	1736
18.75	313	306	189	143	119	119	118	254	121	101	119	104	216	1744
19.00	317	310	192	143	120	119	119	258	122	102	119	105	219	1725
19.25	321	313	194	144	120	120	119	260	122	102	120	105	220	1715
19.50	326	317	197	144	121	120	119	263	123	102	120	106	223	1690
19.75	331	321	200	144	121	121	120	265	123	103	121	106	225	1702
20.00	335	325	203	145	122	121	120	266	124	103	121	107	227	1690
20.25	339	329	205	145	122	121	120	268	124	103	122	107	229	1701
20.50	342	334	208	145	122	122	121	272	125	104	122	107	231	1709
20.75	345	337	211	146	123	122	121	275	125	104	123	108	233	1683
21.00	350	342	214	147	123	122	121	278	126	104	124	108	235	1693
21.25	354	345	217	148	124	123	122	279	127	105	124	109	238	1689
21.50	358	351	220	149	125	123	122	280	127	105	124	109	240	1644
21.75	363	354	222	150	126	124	123	282	128	105	125	110	242	1699
22.00	367	359	225	151	127	124	123	283	129	105	126	110	244	1701
22.25	370	363	228	153	128	125	124	284	130	106	126	111	245	1710
22.50	374	367	231	155	129	126	125	284	131	107	127	112	247	1683
22.75	377	370	233	156	129	127	125	285	132	107	127	112	248	1727
23.00	380	374	236	158	129	128	126	287	134	108	128	113	250	1697
23.25	385	378	239	159	129	128	127	288	135	108	129	113	252	1684
23.50	388	381	241	160	130	129	127	289	135	108	130	114	254	1728
23.75	391	385	244	161	130	130	128	291	137	109	130	114	256	1723
24.00	395	388	247	163	131	131	129	293	137	109	131	115	258	1749
24.25	397	391	249	164	128	131	129	295	138	110	132	116	259	1698
24.50	401	395	252	165	128	132	130	296	139	110	133	116	262	1735
24.75	404	398	254	167	128	133	131	298	140	111	133	117	264	1736
25.00	407	401	257	168	129	134	131	300	140	111	134	118	266	1745
25.25	408	403	259	170	130	134	132	301	141	112	135	118	267	1762



Total Quality. Assured.

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Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	Pass/ Fail													
	TC #28 (°F)	TC #29 (°F)	TC #30 (°F)	TC #31 (°F)	TC #32 (°F)	TC #33 (°F)	TC #34 (°F)	TC #35 (°F)	TC #36 (°F)	TC #37 (°F)	TC #38 (°F)	TC #39 (°F)	TC #40 (°F)	TC #41 (°F)
25.50	409	405	261	171	131	135	133	305	142	112	135	119	267	1821
25.75	410	405	263	173	132	136	134	307	143	113	136	120	269	1758
26.00	412	408	266	174	133	137	134	308	143	113	137	120	271	1759
26.25	415	411	268	176	134	138	135	308	144	113	137	121	273	1784
26.50	418	414	271	178	135	139	136	309	145	114	138	122	274	1781
26.75	420	415	273	180	137	140	137	310	147	115	139	122	275	1799
27.00	423	417	276	181	138	141	138	310	147	115	140	123	278	1785
27.25	425	420	278	183	138	142	138	310	148	116	140	124	280	1790
27.50	430	423	281	184	138	143	139	310	149	116	141	124	280	1788
27.75	432	426	283	185	139	144	139	311	150	117	142	125	282	1783
28.00	435	429	286	187	140	145	140	311	151	118	142	125	282	1786
28.25	437	431	288	188	141	145	141	311	152	118	143	126	285	1779
28.50	438	433	290	189	142	146	141	311	153	119	144	127	286	1800
28.75	442	435	293	190	142	147	142	313	153	120	145	127	287	1792
29.00	445	438	295	191	142	147	142	315	155	120	146	128	288	1819
29.25	445	439	297	192	142	148	143	318	155	121	146	128	288	1807
29.50	447	441	299	192	143	149	144	320	156	121	147	129	290	1805
29.75	448	442	301	193	144	149	144	321	157	121	147	129	291	1797
30.00	451	444	303	194	145	150	145	321	158	122	149	130	292	1792
Max Temp	451	444	303	194	145	150	145	321	158	122	149	130	292	1821
Max Allowed	1000			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

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Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	TC #42 (°F)	TC #43 (°F)	TC #44 (°F)	TC #45 (°F)	TC #46 (°F)	TC #47 (°F)	TC #48 (°F)	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail
								TC #49 (°F)	TC #50 (°F)	TC #51 (°F)	TC #52 (°F)	TC #53 (°F)	TC #54 (°F)
0.00	104	94	87	93	71	84	80	71	72	71	72	72	71
0.25	693	607	429	406	71	412	453	72	72	71	72	72	71
0.50	1031	1008	788	771	71	796	817	72	72	71	71	72	71
0.75	1112	1128	937	917	71	970	946	72	72	71	72	72	71
1.00	1173	1199	1020	990	71	1056	1012	72	72	71	71	72	71
1.25	1178	1211	1059	1026	71	1096	1052	72	72	71	72	72	71
1.50	1220	1218	1080	1047	71	1136	1088	72	72	71	72	72	71
1.75	1233	1241	1112	1071	71	1161	1118	72	72	71	72	72	71
2.00	1283	1250	1123	1092	71	1192	1153	72	72	71	72	72	71
2.25	1307	1273	1136	1096	71	1202	1154	72	72	71	72	72	72
2.50	1300	1274	1152	1106	71	1213	1160	72	72	72	72	72	72
2.75	1328	1284	1158	1122	72	1220	1168	72	72	71	72	72	72
3.00	1347	1300	1168	1134	72	1236	1175	72	72	72	72	72	72
3.25	1352	1321	1180	1144	71	1254	1192	72	72	71	72	72	72
3.50	1308	1330	1190	1153	72	1265	1204	72	72	72	72	72	72
3.75	1374	1339	1201	1169	72	1279	1221	72	72	72	72	72	72
4.00	1378	1357	1227	1191	72	1287	1234	72	73	72	72	73	72
4.25	1362	1383	1247	1238	72	1336	1293	73	73	72	72	72	72
4.50	1420	1411	1259	1241	72	1346	1276	73	73	72	72	73	72
4.75	1437	1411	1260	1260	72	1330	1256	73	74	72	72	73	72
5.00	1421	1411	1267	1255	72	1330	1272	73	73	72	72	73	72
5.25	1382	1402	1268	1250	72	1333	1284	73	74	72	72	73	72
5.50	1399	1409	1278	1247	72	1335	1286	72	74	72	72	73	73
5.75	1396	1411	1277	1255	72	1337	1291	73	75	72	72	73	73
6.00	1402	1417	1279	1257	72	1335	1292	73	76	72	73	73	73
6.25	1424	1421	1285	1253	72	1345	1296	73	76	73	73	73	73
6.50	1433	1416	1288	1253	72	1356	1304	73	75	72	73	73	73
6.75	1419	1400	1294	1252	72	1351	1316	73	75	72	73	73	73
7.00	1455	1427	1292	1259	72	1354	1309	73	76	73	73	73	73
7.25	1476	1413	1291	1266	72	1344	1322	73	76	73	73	74	73
7.50	1434	1417	1306	1257	72	1359	1340	73	76	73	73	75	73
7.75	1429	1429	1309	1263	72	1367	1332	74	77	73	73	75	73
8.00	1453	1425	1312	1268	72	1380	1338	74	77	73	74	75	73
8.25	1458	1423	1310	1271	72	1373	1345	74	78	73	74	76	73
8.50	1461	1436	1318	1282	72	1379	1340	76	78	73	74	76	73
8.75	1450	1444	1317	1288	73	1385	1330	76	78	73	74	76	73
9.00	1477	1460	1321	1293	73	1391	1342	75	78	73	74	76	73
9.25	1526	1476	1317	1309	73	1394	1345	75	80	73	74	76	73
9.50	1515	1471	1310	1321	73	1383	1353	75	78	73	74	77	73
9.75	1468	1465	1324	1308	73	1390	1353	76	81	74	74	77	73
10.00	1467	1470	1326	1310	73	1398	1356	76	81	74	75	78	73
10.25	1463	1477	1328	1314	73	1397	1357	75	80	75	75	78	74
10.50	1484	1477	1327	1324	73	1405	1353	76	80	75	75	79	76
10.75	1550	1496	1325	1331	73	1405	1364	76	78	75	75	78	75
11.00	1522	1507	1332	1339	73	1425	1367	76	79	75	75	78	74
11.25	1484	1490	1338	1332	73	1421	1372	76	81	74	76	78	74
11.50	1526	1488	1338	1336	73	1407	1358	76	81	74	76	79	75
11.75	1515	1502	1339	1340	74	1423	1368	76	83	75	76	80	74
12.00	1509	1513	1350	1350	74	1435	1365	76	82	74	76	80	73
12.25	1498	1502	1355	1348	74	1435	1375	76	85	74	77	80	74
12.50	1515	1488	1362	1339	74	1429	1387	75	84	74	77	80	74



Total Quality. Assured.

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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	TC #42 (°F)	TC #43 (°F)	TC #44 (°F)	TC #45 (°F)	TC #46 (°F)	TC #47 (°F)	TC #48 (°F)	TC #49 (°F)	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail	Pass/ Fail
									TC #50 (°F)	TC #51 (°F)	TC #52 (°F)	TC #53 (°F)	TC #54 (°F)	
12.75	1513	1489	1363	1341	74	1433	1381	76	85	74	77	81	74	
13.00	1529	1493	1366	1347	74	1430	1387	79	84	75	77	80	74	
13.25	1557	1484	1366	1344	74	1430	1382	80	88	75	77	81	74	
13.50	1503	1486	1367	1344	74	1429	1400	78	87	77	78	81	75	
13.75	1506	1490	1367	1350	74	1444	1398	78	85	76	78	83	76	
14.00	1545	1519	1368	1367	74	1434	1382	79	86	76	78	81	75	
14.25	1540	1494	1370	1358	74	1434	1400	80	89	75	77	83	76	
14.50	1503	1507	1380	1355	75	1441	1389	80	89	76	77	81	75	
14.75	1497	1500	1386	1357	75	1447	1405	80	90	76	77	80	75	
15.00	1533	1509	1388	1362	75	1451	1411	80	87	77	78	81	75	
15.25	1608	1546	1404	1388	76	1484	1448	80	91	76	78	82	76	
15.50	1633	1578	1425	1408	76	1517	1478	80	88	77	78	83	75	
15.75	1645	1586	1431	1421	76	1508	1460	79	93	77	79	82	75	
16.00	1634	1602	1430	1442	76	1516	1485	80	92	76	79	80	75	
16.25	1648	1601	1440	1441	77	1540	1516	81	91	76	79	84	75	
16.50	1662	1618	1446	1446	77	1545	1500	83	87	76	79	81	76	
16.75	1619	1616	1463	1448	78	1552	1510	82	91	76	79	81	77	
17.00	1560	1603	1466	1448	76	1553	1504	81	86	76	80	83	77	
17.25	1557	1600	1457	1440	76	1549	1477	79	88	77	80	81	76	
17.50	1598	1596	1444	1438	77	1545	1491	80	90	77	81	84	76	
17.75	1603	1601	1437	1448	78	1532	1494	81	89	77	80	85	77	
18.00	1651	1576	1437	1436	83	1527	1476	81	90	77	80	84	77	
18.25	1561	1604	1451	1431	82	1542	1477	81	92	77	81	85	76	
18.50	1541	1589	1448	1436	82	1537	1473	83	97	77	81	85	76	
18.75	1531	1569	1454	1430	80	1544	1465	84	93	78	81	85	77	
19.00	1600	1594	1448	1432	84	1542	1482	85	94	78	81	82	77	
19.25	1614	1631	1450	1443	80	1555	1476	85	91	78	81	85	77	
19.50	1633	1603	1443	1442	78	1553	1488	83	93	78	82	84	77	
19.75	1585	1594	1449	1440	79	1559	1502	80	93	77	82	83	77	
20.00	1636	1575	1441	1437	1572	1542	1486	79	93	77	80	86	78	
20.25	1660	1584	1448	1447	1587	1549	1499	80	90	78	82	85	77	
20.50	1554	1593	1458	1438	1584	1552	1491	88	92	78	80	87	77	
20.75	1593	1589	1451	1442	1578	1549	1509	86	93	79	81	84	78	
21.00	1567	1588	1452	1442	1595	1544	1520	88	97	79	81	87	78	
21.25	1646	1619	1455	1454	1590	1554	1495	88	95	79	82	87	77	
21.50	1660	1610	1447	1454	1582	1558	1511	88	98	79	82	87	78	
21.75	1614	1610	1457	1453	1592	1552	1482	86	92	78	82	88	78	
22.00	1564	1611	1464	1456	1623	1557	1504	87	97	79	83	85	79	
22.25	1661	1609	1460	1456	1593	1554	1495	87	95	79	84	87	79	
22.50	1630	1598	1456	1456	1594	1559	1512	86	93	79	84	84	79	
22.75	1652	1609	1461	1459	1592	1558	1498	88	94	80	84	89	79	
23.00	1621	1611	1462	1466	1603	1562	1514	88	95	80	83	86	80	
23.25	1670	1611	1462	1462	1596	1561	1504	87	94	80	84	86	79	
23.50	1638	1603	1461	1458	1603	1558	1486	87	93	81	84	89	79	
23.75	1640	1608	1466	1459	1599	1554	1490	87	87	80	84	85	79	
24.00	1617	1608	1468	1466	1596	1559	1493	89	96	80	84	88	79	
24.25	1644	1605	1464	1462	1600	1565	1504	88	94	80	84	89	80	
24.50	1662	1613	1465	1468	1607	1565	1509	91	94	80	85	85	80	
24.75	1658	1609	1465	1478	1616	1567	1493	87	97	80	84	86	79	
25.00	1653	1607	1477	1471	1610	1572	1510	89	92	81	86	87	81	
25.25	1651	1638	1495	1486	1642	1591	1558	88	92	80	85	87	81	



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Report No.: G104231720SAT-002 R3

Date: 01/30/20

Arconic

Project No. G104231720SAT-002

January 10, 2020

Time (min)	TC #42 (°F)	TC #43 (°F)	TC #44 (°F)	TC #45 (°F)	TC #46 (°F)	TC #47 (°F)	TC #48 (°F)	TC #49 (°F)	TC #50 (°F)	TC #51 (°F)	TC #52 (°F)	TC #53 (°F)	TC #54 (°F)	Pass/Fail	Pass/Fail	Pass/Fail	Pass/Fail	Pass/Fail	Pass/Fail
25.50	1634	1634	1507	1488	1652	1605	1554	86	99	81	87	91	82						
25.75	1666	1650	1505	1499	1664	1616	1578	87	108	80	86	92	81						
26.00	1674	1647	1498	1509	1655	1612	1557	89	96	81	85	86	83						
26.25	1680	1669	1505	1516	1675	1620	1568	90	98	81	86	87	81						
26.50	1681	1679	1512	1517	1675	1628	1575	88	99	82	86	88	82						
26.75	1673	1652	1511	1512	1669	1621	1552	86	105	81	86	89	82						
27.00	1728	1676	1516	1515	1671	1639	1548	89	97	81	86	87	82						
27.25	1743	1687	1512	1532	1675	1630	1547	86	100	82	87	90	82						
27.50	1718	1664	1513	1522	1655	1624	1557	86	97	83	88	87	82						
27.75	1695	1659	1517	1532	1673	1631	1579	88	95	82	87	89	82						
28.00	1722	1662	1523	1524	1665	1637	1586	88	96	82	88	90	82						
28.25	1698	1676	1522	1524	1674	1647	1582	87	96	82	88	87	82						
28.50	1662	1674	1526	1531	1696	1645	1578	93	94	83	88	88	83						
28.75	1658	1666	1529	1525	1689	1647	1587	84	93	82	88	88	82						
29.00	1637	1675	1532	1520	1682	1644	1573	88	98	84	90	91	83						
29.25	1704	1674	1530	1524	1679	1645	1585	87	94	84	88	91	84						
29.50	1689	1668	1533	1532	1687	1644	1600	84	95	82	87	90	83						
29.75	1726	1688	1529	1537	1681	1655	1580	84	100	82	87	87	83						
30.00	1699	1680	1527	1534	1670	1648	1577	83	99	82	87	91	84						
Max Temp	1743	1688	1533	1537	1696	1655	1600	93	108	84	90	92	84						
Max Allowed								571	572	571	572	572	571						



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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

SECTION 15

DRAWINGS

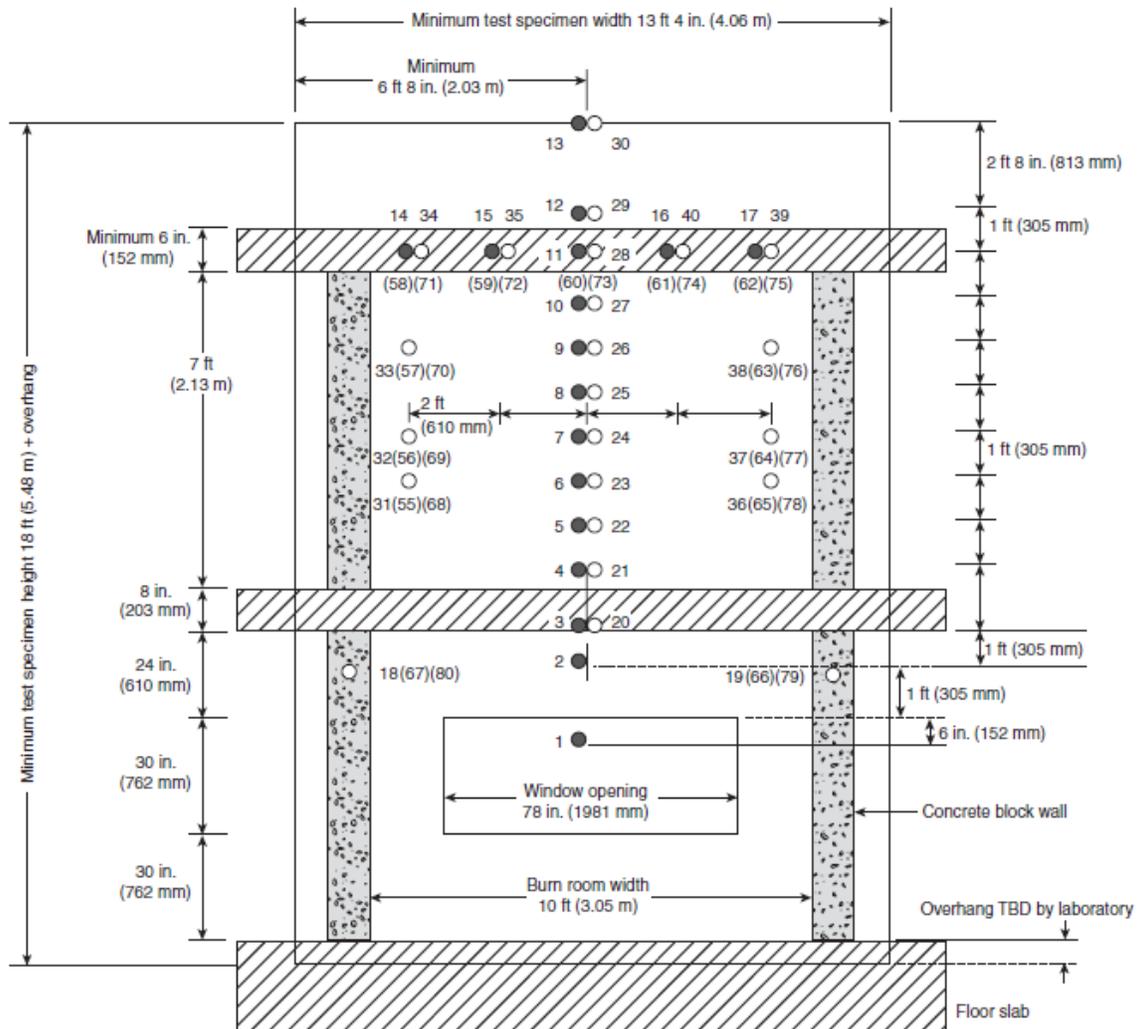
The "As-Built" drawings for the Arconic; Sheet Nos. 1-5, and dated 11/19/20; which follow have been reviewed by Intertek B&C and are representative of the project reported herein. Project construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

Standard TC Locations

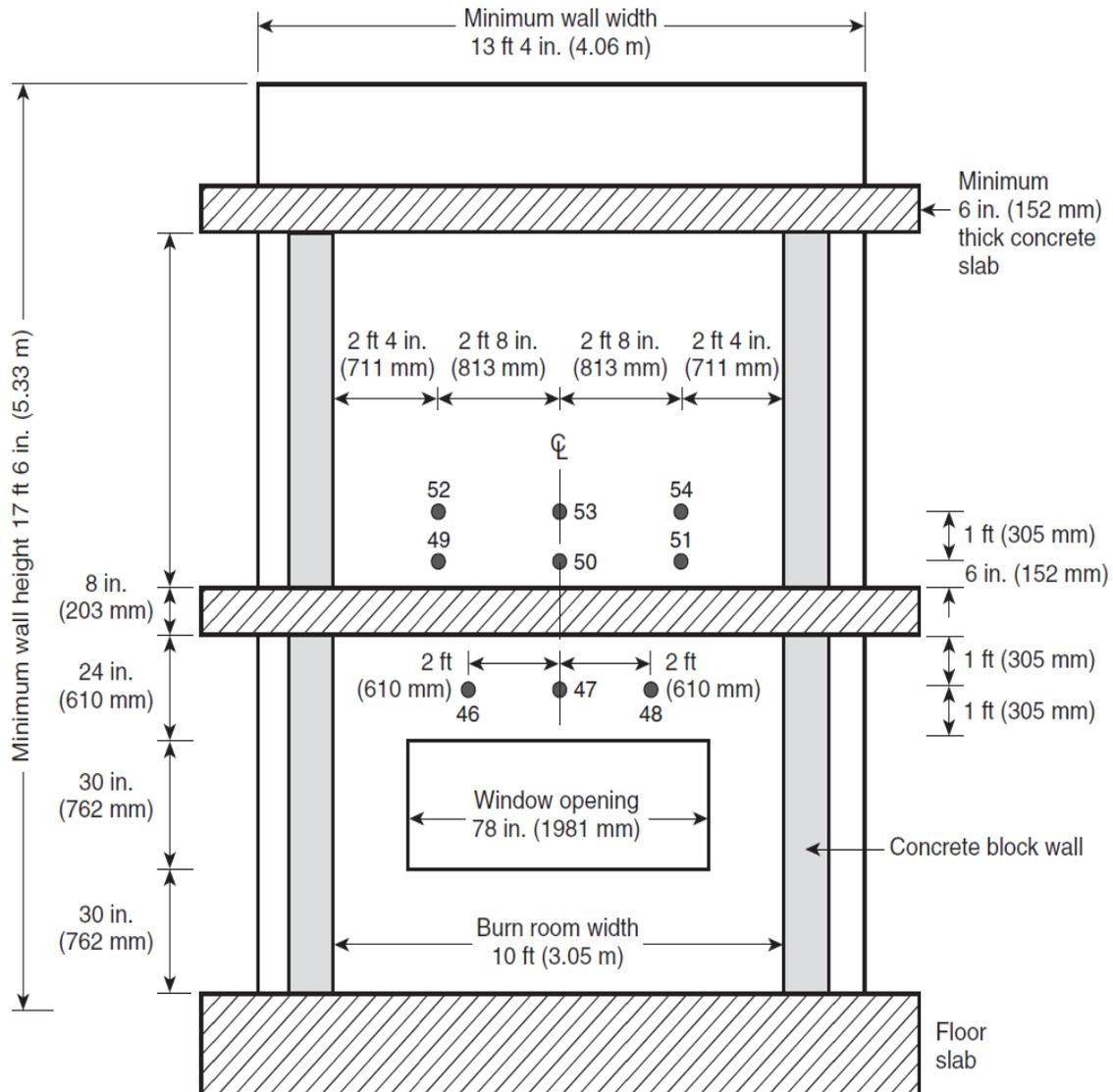


- Thermocouples — 1 in. (25 mm) from exterior wall surface
- Thermocouples — In the wall cavity air space or the insulation, or both, as shown in Figure 6.1(b) Details A through I.
- ◐ Thermocouples — Additional thermocouples in the insulation or the stud cavity, or both, where required for the test specimen construction being tested, as shown in Figure 6.1(b) Details C through I.

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

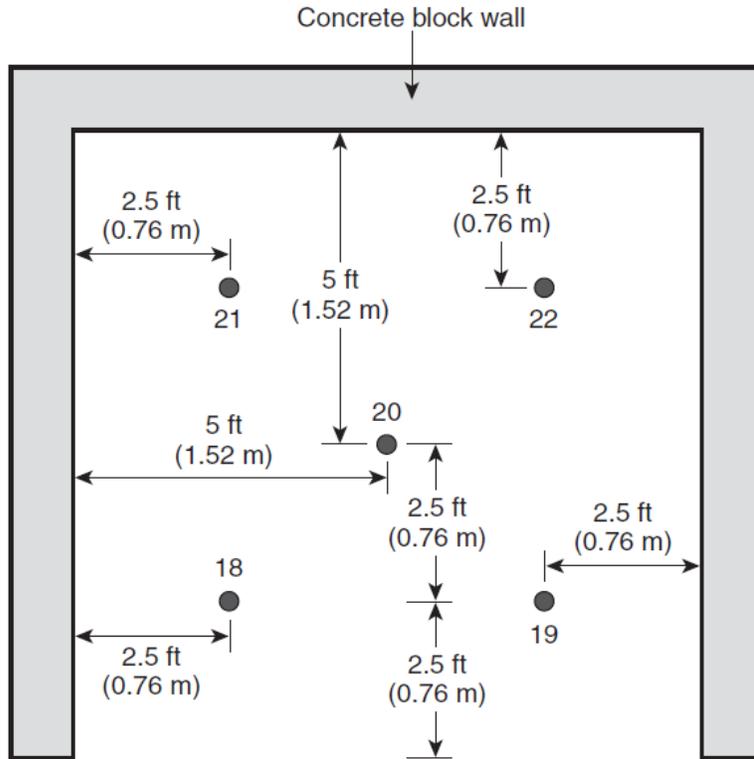


● Thermocouples — 1 in. (25 mm) from interior wall surface

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

Date: 01/30/20

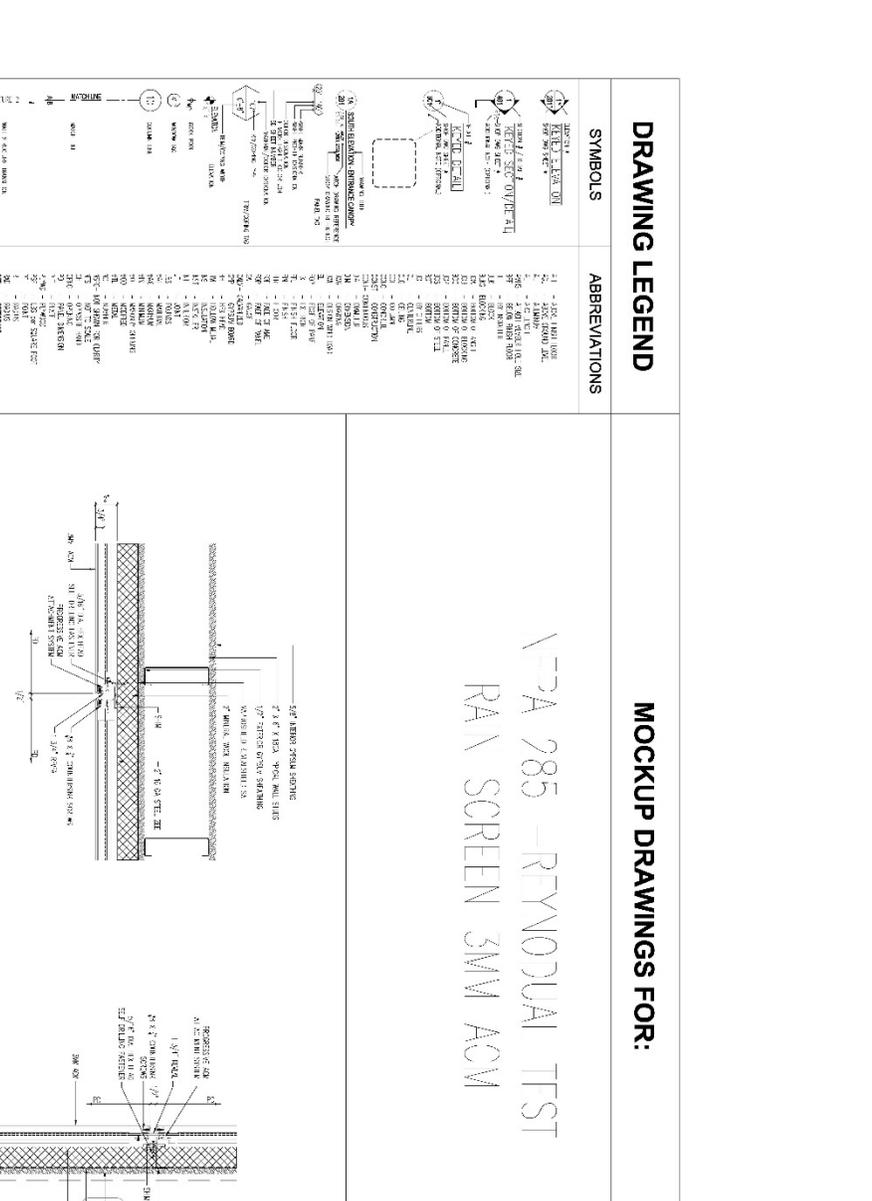


- Thermocouples (5) inside burn room 6 in. (152 mm) below ceiling

TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

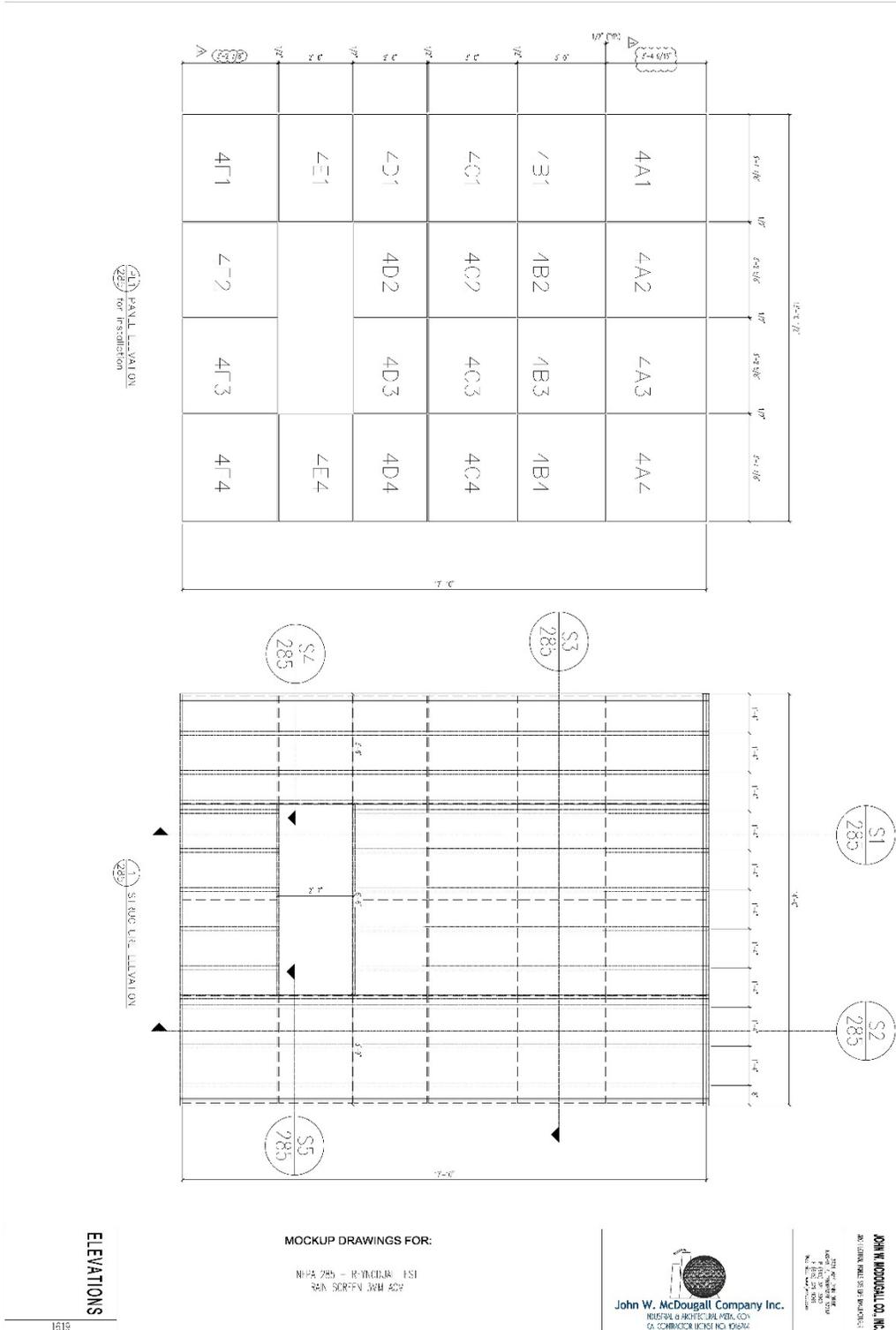
Date: 01/30/20

DRAWING LEGEND	MOCKUP DRAWINGS FOR:																																																																																																				
<p>SYMBOLS</p>  <p>ABBREVIATIONS</p> <table border="1"> <tr><td>1.1</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.2</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.3</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.4</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.5</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.6</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.7</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.8</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.9</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.10</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.11</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.12</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.13</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.14</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.15</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.16</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.17</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.18</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.19</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.20</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.21</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.22</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.23</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.24</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.25</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.26</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.27</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.28</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.29</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.30</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.31</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.32</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.33</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.34</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.35</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.36</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.37</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.38</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.39</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.40</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.41</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.42</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.43</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.44</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.45</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.46</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.47</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.48</td><td>1/4" x 1/4" H100</td></tr> <tr><td>1.49</td><td>1/2" x 1/4" H100</td></tr> <tr><td>1.50</td><td>1/4" x 1/4" H100</td></tr> </table> <p>RAIN SCREEN 3MM</p>	1.1	1/2" x 1/4" H100	1.2	1/4" x 1/4" H100	1.3	1/2" x 1/4" H100	1.4	1/4" x 1/4" H100	1.5	1/2" x 1/4" H100	1.6	1/4" x 1/4" H100	1.7	1/2" x 1/4" H100	1.8	1/4" x 1/4" H100	1.9	1/2" x 1/4" H100	1.10	1/4" x 1/4" H100	1.11	1/2" x 1/4" H100	1.12	1/4" x 1/4" H100	1.13	1/2" x 1/4" H100	1.14	1/4" x 1/4" H100	1.15	1/2" x 1/4" H100	1.16	1/4" x 1/4" H100	1.17	1/2" x 1/4" H100	1.18	1/4" x 1/4" H100	1.19	1/2" x 1/4" H100	1.20	1/4" x 1/4" H100	1.21	1/2" x 1/4" H100	1.22	1/4" x 1/4" H100	1.23	1/2" x 1/4" H100	1.24	1/4" x 1/4" H100	1.25	1/2" x 1/4" H100	1.26	1/4" x 1/4" H100	1.27	1/2" x 1/4" H100	1.28	1/4" x 1/4" H100	1.29	1/2" x 1/4" H100	1.30	1/4" x 1/4" H100	1.31	1/2" x 1/4" H100	1.32	1/4" x 1/4" H100	1.33	1/2" x 1/4" H100	1.34	1/4" x 1/4" H100	1.35	1/2" x 1/4" H100	1.36	1/4" x 1/4" H100	1.37	1/2" x 1/4" H100	1.38	1/4" x 1/4" H100	1.39	1/2" x 1/4" H100	1.40	1/4" x 1/4" H100	1.41	1/2" x 1/4" H100	1.42	1/4" x 1/4" H100	1.43	1/2" x 1/4" H100	1.44	1/4" x 1/4" H100	1.45	1/2" x 1/4" H100	1.46	1/4" x 1/4" H100	1.47	1/2" x 1/4" H100	1.48	1/4" x 1/4" H100	1.49	1/2" x 1/4" H100	1.50	1/4" x 1/4" H100	<p>MOCKUP DRAWINGS FOR:</p> <p>V-2A 285 - RYNOJUAL TTST RAIN SCREEN 3MM ACM</p>  <p>VERTICAL JOINT DETAIL</p> <p>HORIZONTAL JOINT DETAIL</p> <p>MOCKUP DRAWINGS FOR:</p> <p>RYNOJUAL TTST V-2A 285 RAIN SCREEN 3MM ACM</p> <p>John W. McDougall Company Inc. INDUSTRIAL & PROFESSIONAL MECHANICAL A CONTRACT LABORER (IC) 02872</p>
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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

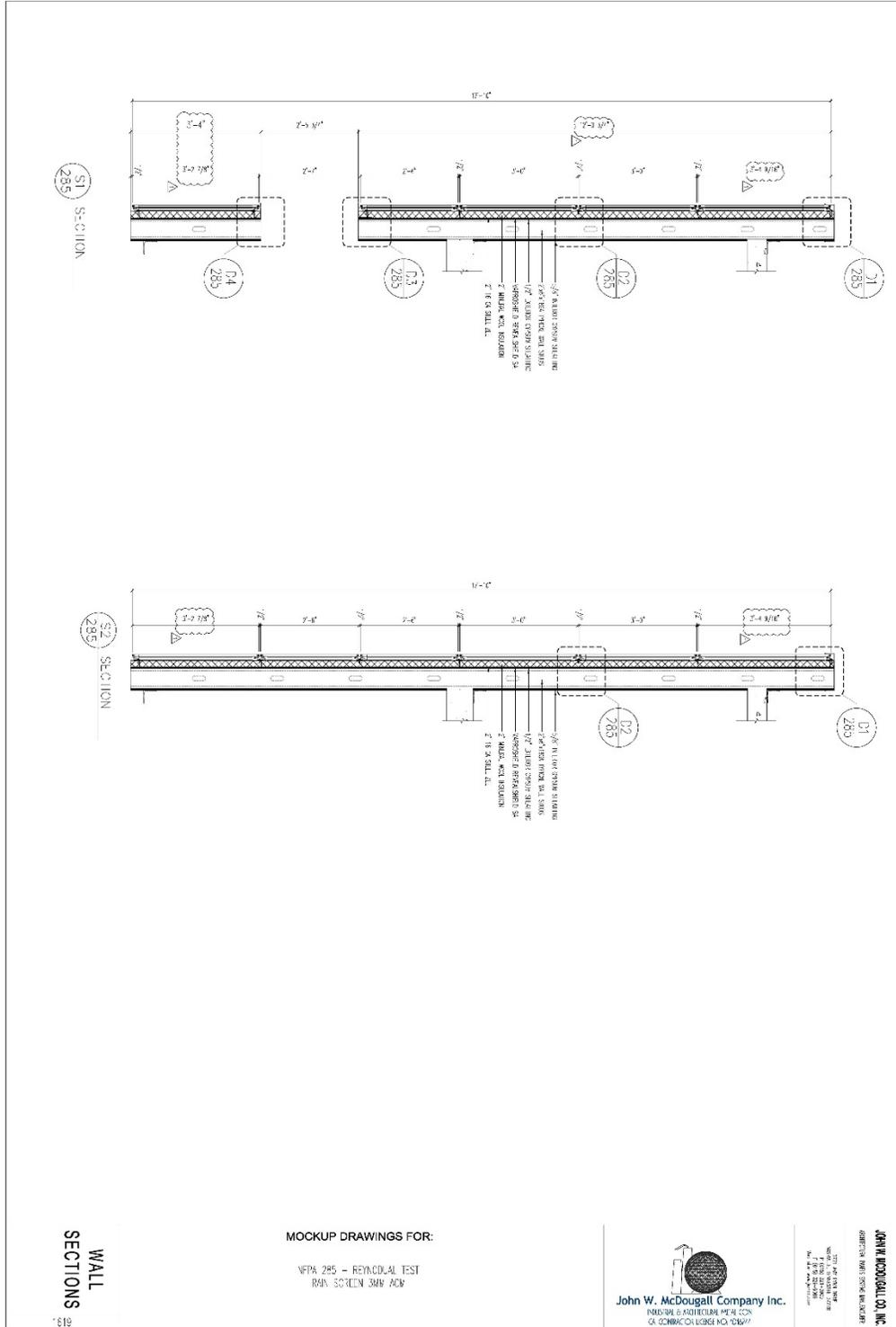
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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G104231720SAT-002 R3

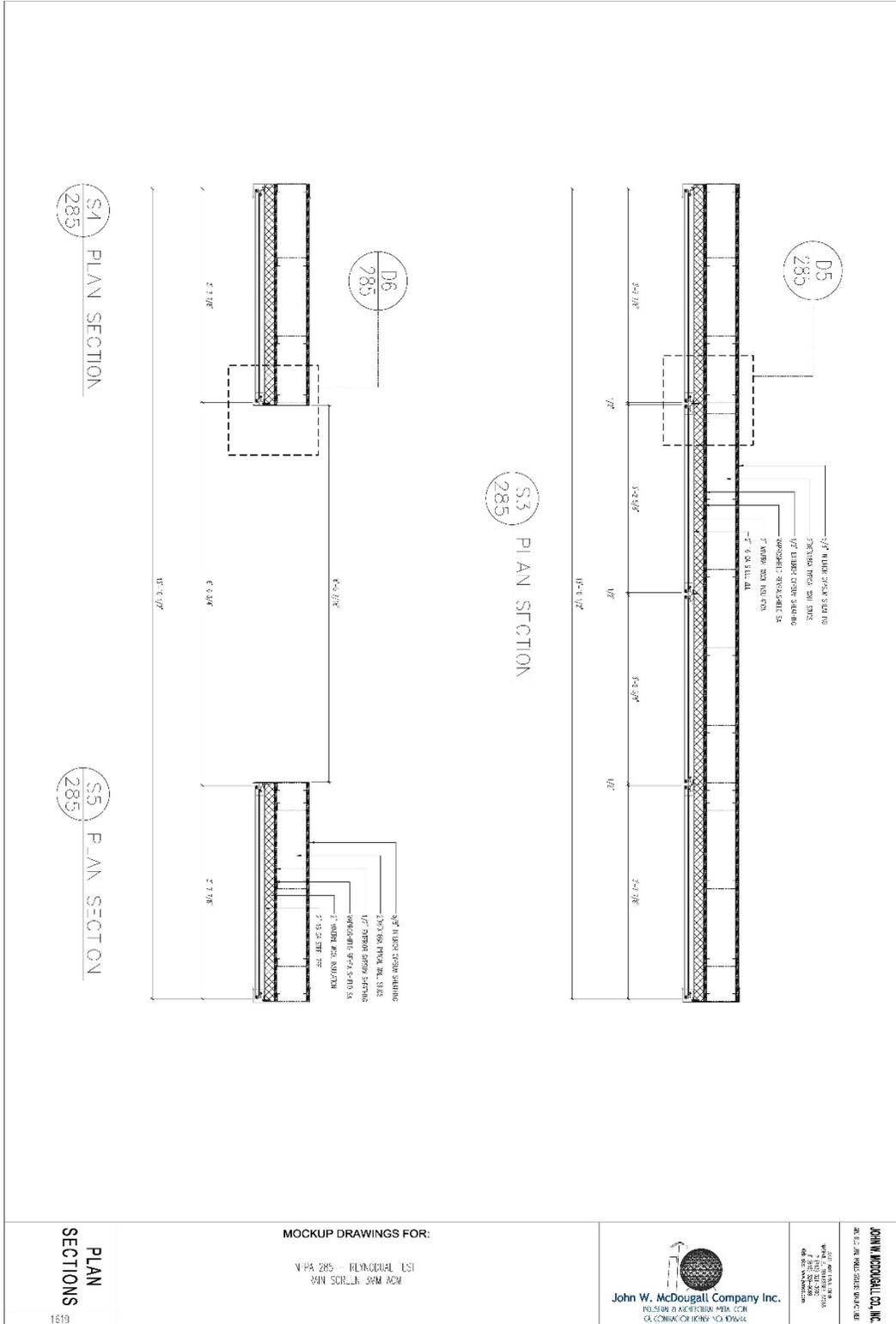
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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

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Date: 01/30/20



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SECTION 16

REVISION LOG

REVISION #	DATE	SECTION	REVISION
0	01/30/20	N/A	Original Report Issue
1	05/18/20	1, 4, 8, 11	Updated product name E.O. HWS
2	05/20/20	Title Page	Revised to refer to material as "bonded sheet" instead of ACM E.O. HWS
3	10/31/22	8	Corrected density for exterior insulation E.O. JA