



**AAMA 1503-98 THERMAL PERFORMANCE
TEST REPORT**

Rendered to:

CMI ARCHITECTURAL PRODUCTS, INC

SERIES/MODEL: 351 Thermal Clad Door

TYPE: Aluminum Door Leaf

Report No.: 02-45555.01
Report Date: 07/08/03

AAMA 1503-98 THERMAL PERFORMANCE TEST REPORT

Rendered to:

CMI ARCHITECTURAL PRODUCTS, INC
2800 Freeway Blvd Ste 205
Minneapolis, Minnesota 55430

Report No: 02-45555.01
Test Date: 06/03/03
Report Date: 07/11/03

Test Sample Identification:

Series/Model: 351 Thermal Clad Door

Type: Aluminum Door Leaf

Test Procedure: The condensation resistance factor (CRF) and thermal transmittance (U) were determined in accordance with AAMA 1503-98, *Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections*.

- | | |
|---|--------|
| 1. Average warm side ambient temperature | 70.0 F |
| 2. Average cold side ambient temperature | 0.0 F |
| 3. 15 mph dynamic wind applied to test specimen exterior. | |
| 4. $0.0" \pm 0.04"$ static pressure drop across specimen. | |

Test Results Summary:

- | | |
|---|------|
| 1. Condensation resistance factor – Frame (CRF _f) | 42 |
| Condensation resistance factor – Glass (CRF _g) | 63 |
| 2. Thermal transmittance due to conduction (U _s) | 0.61 |
| (U-factors expressed in Btu/hr-ft ² -F) | |

Test Sample Description:

CONSTRUCTION	Leaf Panel
Size (in.)	35.8 x 93.3
Daylight Opening (in.)	27.3 x 78.3
CORNERS	Coped
Fasteners	Screws
Sealant	Silicone
MATERIAL	AT (0.25")
Color Exterior	Silver
Finish Exterior	Anodized
Color Interior	Silver
Finish Interior	Anodized
GLAZING METHOD	Exterior

GLAZING	Sheet #1	Gap #1	Sheet #2
Thickness (in.)	1/4"	0.51	1/4"
Coating Emissivity	Unverified	NA	NA
Coating Surface	2	NA	NA
Spacer/Sealant	NA	A1 (Aluminum)	NA
Material	LowE Tempered	90% Argon*	Clear Tempered
Gas Fill Method	Single-probe timed*		

**Stated per Client/Manufacturer*

NA Non-Applicable

See Appendix A for Description Codes

Test Sample Description: (Continued)

COMPONENTS		
Type	Quantity	Location
WEATHERSTRIP		
NA		
HARDWARE		
NA		
DRAINAGE		
No drainage		

Test Duration:

1. The environmental systems were started at 12:18 hrs., 06/03/03
2. The thermal performance test results were derived from 03:03 hrs., 06/04/03 to 05:03 hrs., 06/04/03.

Condensation Resistance Factor (CRF):

The following information, condensed from the test data, was used to determine the condensation resistance factor:

T_h	=	Warm side ambient air temperature	70.03 F
T_c	=	Cold side ambient air temperature	-0.05 F
FT_p	=	Average of pre-specified frame temperatures (14)	29.81 F
FT_r	=	Average of roving thermocouples (4)	26.51 F
W	=	$(FT_p - FT_r) / [FT_p - (T_c + 10)] \times 0.40$	0.066
FT	=	$FT_p(1-W) + W(FT_r)$ = Frame Temperature	29.59 F
GT	=	Glass Temperature	43.82 F
CRF_g	=	Condensation resistance factor – Glass	63
		$CRF_g = (GT - T_c) / (T_h - T_c) \times 100$	
CRF_f	=	Condensation resistance factor – Frame	42
		$CRF_f = (FT - T_c) / (T_h - T_c) \times 100$	

The CRF number was determined to be 42 (on the size as reported). When reviewing this test data, it should be noted that the frame temperature (FT) was colder than the glass temperature (GT) therefore controlling the CRF number. Refer to the 'CRF Report' page and the 'Thermocouple Location Diagram' page of this report.

Thermal Transmittance (U_s):

T_h	= Average warm side ambient temperature	70.03 F
T_c	= Average cold side ambient temperature	-0.05 F
P	= Static pressure difference across test specimen 15 mph dynamic perpendicular wind at exterior	0.00 psf
Nominal sample area		23.15 ft ²
Total measured input to calorimeter		1078.37 Btu/hr
Calorimeter correction		-85.20 Btu/hr
Net specimen heat loss		993.17 Btu/hr
U_s	= Thermal Transmittance	0.61 Btu/hr-ft ² -F

Glazing Deflection (in.):

	Fixed Glazing
Thickness at edge	0.51
Center thickness upon receipt of specimen in laboratory (after stabilization)	0.42
Center thickness at laboratory ambient conditions on day of testing	0.42
Center thickness at test conditions	0.39

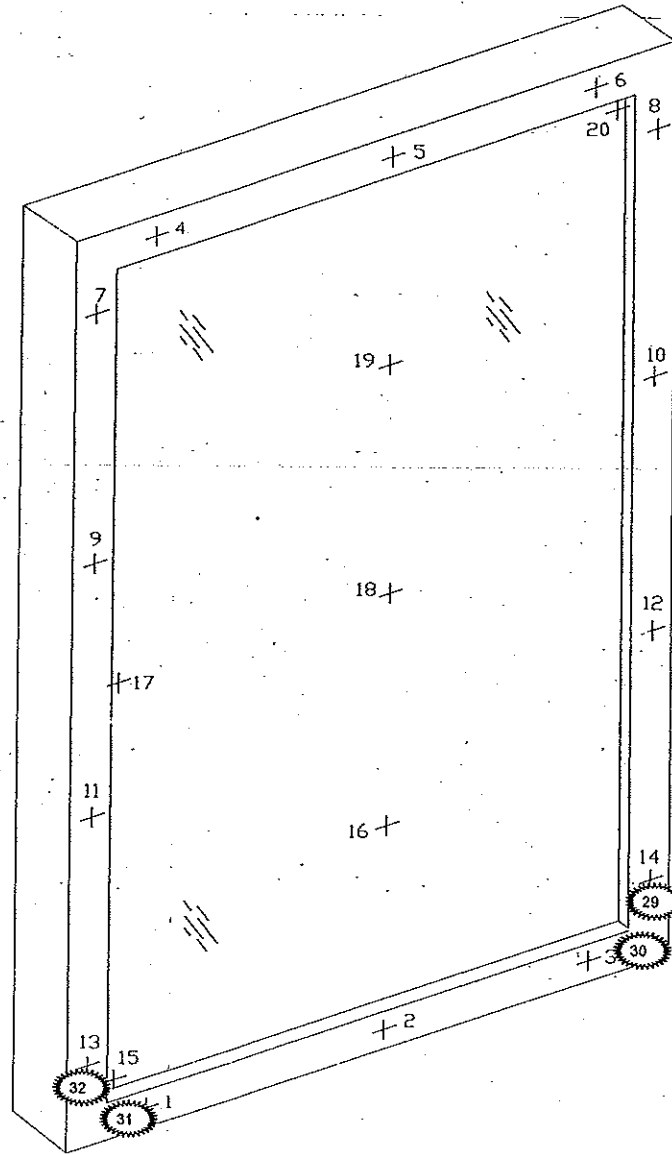
The test sample was inspected for the formation of frost or condensation which may influence the surface temperature measurements. Any observed condensation/frost is indicated on the 'Thermocouple Location Diagram.'

A calibration of the ATI 'thermal test chamber' in St. Paul, Minnesota was conducted in October 2002.

CRF Report

Time:	03:03	03:33	04:03	04:33	05:03	AVERAGE
Pre-specified Thermocouples - Frame						
1	28.2	28.2	28.1	28.1	28.1	28.1
2	28.4	28.5	28.4	28.3	28.4	28.4
3	28.5	28.4	28.5	28.4	28.4	28.4
4	33.8	33.8	33.8	33.7	33.8	33.8
5	32.4	32.4	32.3	32.3	32.4	32.4
6	31.2	31.1	31.1	31.1	31.1	31.1
7	32.4	32.5	32.5	32.5	32.5	32.5
8	33.9	33.9	33.8	33.8	33.8	33.8
9	29.2	29.0	29.0	29.1	28.9	29.1
10	29.6	29.5	29.1	29.5	28.9	29.3
11	28.2	28.1	28.0	28.1	28.0	28.1
12	27.6	27.5	27.6	27.2	27.5	27.5
13	27.1	27.1	27.3	27.0	27.3	27.2
14	27.7	27.7	27.7	27.7	27.5	27.7
FT _p	29.9	29.8	29.8	29.8	29.8	29.8
Pre-specified Thermocouples - Glass						
15	33.5	33.4	33.5	33.5	33.4	33.4
16	50.0	50.0	49.9	49.9	49.9	49.9
17	39.7	39.7	39.7	39.7	39.6	39.7
18	38.6	38.6	38.5	38.5	38.5	38.5
19	51.2	51.3	51.2	51.2	51.1	51.2
20	50.2	50.2	50.1	50.1	50.1	50.2
GT	43.9	43.9	43.8	43.8	43.8	43.8
Cold Point (Roving) Thermocouples						
29	26.1	26.1	26.1	26.1	26.1	26.1
30	26.1	26.1	26.1	26.1	26.1	26.1
31	27.1	27.1	27.3	27.0	27.3	27.2
32	26.6	26.6	26.6	26.6	26.6	26.6
FT _R	26.5	26.5	26.5	26.5	26.5	26.5
W	0.067	0.067	0.066	0.067	0.065	0.066
FT	29.7	29.6	29.6	29.6	29.5	29.6
Warm Side - Room Ambient Air Temperature						
	70.1	70.1	70.0	70.0	70.0	70.0
Cold Side - Room Ambient Air Temperature						
	0.0	-0.1	-0.1	0.0	0.0	0.0
CRF _f	42.3	42.3	42.3	42.3	42.2	42
CRF _g	62.6	62.6	62.6	62.6	62.5	63

Thermocouple Location Diagram



Cold Point Locations

29	29 26.1
30	30 26.1
31	31 27.2
32	32 26.6

Detailed drawings, representative samples of the test specimen and a copy of this report will be retained by ATI for a period of four years. This report is the exclusive property of the client so named herein and relates only to the fenestration product tested. This report may not be reproduced, except in full, without the approval of the laboratory. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory.

For ARCHITECTURAL TESTING, INC.

Jacob R. Fischer

Jacob R. Fischer
Technician

Dennis L. Anderson

Dennis L. Anderson
Laboratory Manager

JRF

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