



NATIONAL CERTIFIED TESTING LABORATORIES

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**VALE COMPANY
AAMA THERMAL TEST SUMMARY REPORT**

Report No: NCTL-110-13245-1S
Expiration Date: 09/23/14

Test Specimen: Vale Company's Series "V-250" an aluminum edge panel/leaf with fiberglass skins measuring 37-1/2" wide by 80-1/2" high overall. The specimen was not thermally broken.

Procedure: Condensation Resistance Factor (CRF) and Thermal Transmittance (U Factor) were determined in accordance with AAMA 1503-09 with a temperature of 70.0± 0.5°F on the room side of the specimen and 0.0± 0.5°F plus a 15 mph dynamic wind on the weather side of specimen. The test specimen was sealed to produce a net air leakage of 0.0 cfm during the test.

Test Results:

- | | |
|---|---------|
| 1. Average warm side air temperature (t ₁): | 69.8 °F |
| 2. Average cold side air temperature (t ₂): | -0.3 °F |
| 4. Average glass temperature (GT): | 36.4 °F |
| 6. Condensation Resistance Factor of Glass (CRF _g): | 52 |
| 7. Condensation Resistance Factor of Specimen (CRF): | 52 |

Thermal transmittance (U Factor) @ 15 mph exterior wind velocity: 0.35 BTU/hr/ft²/°F

Reference should be made to thermal performance test report number NCTL-110-13245-1 for complete specimen description and test data.

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DIGITAL SIGNATURE

STEVEN H. COBLE
Thermal & Simulation Manager



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THERMAL PERFORMANCE TEST REPORT

Report No: NCTL-110-13245-1
Test Date: 00/00/00
Report Date: 11/11/11
Expiration Date: 00/00/12

Client: *Vale Company
409-11-13 Mac Dade Blvd.
Collingdale, PA 19023*

Test Specimen: *Vale Company's Series "V-250" Fiberglass Door Leaf with Aluminum Edge.*

Test Method: *AAMA 1503-09, "Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections".*

TEST SPECIMEN DESCRIPTION

General: *The test specimen was an aluminum edge panel/leaf with fiberglass skins measuring 37-1/2" wide by 80-1/2" high overall. The overall leaf thickness was 1-3/4" consisting of two (2) fiberglass skins measuring approximately 0.110" thick with an expanded polystyrene core. The leaf corners were of butt-type corner construction with a 3/8" threaded rod employing one (1) nut at each end. The specimen was not thermally broken. The adhesive-backed skins were attached to the leaf frame by an extruded aluminum cover fastened with evenly spaced screws at the perimeter.*

Glazing: *Not applicable.*

Weatherseals: *No weatherseals employed.*

Weeps: *No weeps employed.*

Interior & Exterior Surface Finish: *Green painted fiberglass with a clear aluminum edge.*

Sealant: *The leaf corners were sealed with a small-joint sealant.*

SPECIMEN PREPARATION PRIOR TO TEST

The test specimen was pre-conditioned at ambient laboratory conditions prior to the test. The surround panel-to-specimen interfaces were sealed with a non-reflective tape. Per section 9.3.4 the specimen was sealed on the exterior with a caulk sealant resulting in a net air leakage of 0.0 cfm per square foot.

TEST PARAMETERS

Tests to determine the thermal transmittance (U-factor) of the specimen were performed in the guarded hot box apparatus located at the York, PA facility. The thermal performance evaluations were completed in accordance with the referenced test methods using a dynamic wind perpendicular to the specimen on the cold side and simulated natural convection on the warm side. A zero static pressure differential ($0.00" \pm 0.04" H_2O$) was maintained across the specimen during the test by pressurizing the metering box on the room side. Data was collected over a 2 hour evaluation period after 4 hours of steady state conditions as defined in section 9.3.8 of the AAMA 1503-09 test procedure were achieved. The test was considered completed when the data of the 2 hour evaluation period also satisfied the criteria defined in section 9.3.8 of the AAMA 1503-09 test procedure.

Glass Thickness and Glazing Deflection: Not applicable.

Projected Frame Dimensions Of Members: Not applicable.

Test Duration:

The test chamber environmental systems were initiated at 0925 on 09/22/10. The test conditions were considered stable for a four (4) hour test period from 1400 to 1800 on 09/23/10. The thermal performance test results were derived from the two (2) hour evaluation period from 1800 to 2000 on 09/23/10.

Areas:

Test Specimen Projected Area (As):	20.90 ft ²
Test Specimen Interior Exposed (Wetted) Surface Area (Aint):	20.90 ft ²
Test Specimen Exterior Exposed (Wetted) Surface Area (Aext):	20.90 ft ²
Metering Box Opening Area (Amb):	54.39 ft ²
Metering Box Baffle Area (Ab1):	46.44 ft ²
Surround Panel Interior Exposed Area (Asp):	5.10 ft ²
Exposed Area of Mods to Surround Panel Opening:	28.39 ft ²

Test Conditions:

Average Room Side Air Temperature:	69.8 °F
Average Weather Side Air Temperature:	-0.3 °F
Average Guard Box Air Temperature:	71.6 °F
Metering Box Average Relative Humidity:	15 %
Measured Weather Side Wind Velocity:	14.3 mph
Static Pressure Difference Across Specimen _(assumed) :	0.00 " H ₂ O

Heat Flows:

Heat Input Rate to Metering Box (Q_{total}):	637.0	BTU/hr
Surround Panel Heat Flow (Q_{sp}):	13.7	BTU/hr
Heat Flow Through Mods to Surround Panel Opening ($k = 0.245$):	61.3	BTU/hr
Surround Panel Thickness:	6.375	Inches
Surround Panel Conductance:	0.0412	BTU/hr/ft ² /°F
Metering Box Heat Flow (Q_{mb}):	28.4	BTU/hr
Flanking Loss Heat Flow (Q_{fl}):	19.5	BTU/hr
Net Test Specimen Heat Flow (Q_s):	514.1	BTU/hr

Surface Temperature Data

Specimen Area-Weighted Room Side Surface Temperature (t_1):	47.7	°F
Specimen Area-Weighted Weather Side Surface Temperature (t_2):	5.5	°F
Area-Weighted Room Side Edge-of-Glass Surface Temperature:	23.6	°F
Area-Weighted Weather Side Edge-of-Glass Surface Temperature:	11.3	°F
Area-Weighted Room Side Center-of-Glass Surface Temperature:	62.1	°F
Area-Weighted Weather Side Center-of-Glass Surface Temperature:	2.1	°F

Test Results & Calculated Test Data:**Condensation Resistance Factor (CRF)**

Average of Cold Point Thermocouples (FT_c):	23.2	°F
Calculated Weighting Factor:	0.403	
Average Glazing Temperature, (GT):	36.4	°F
Condensation Resistance Factor of Glass (CRF_g):	52	
Condensation Resistance Factor of Specimen (CRF):	52	

Thermal Transmittance (U Factor)

Measured Room Side Surface Conductance (hI):	1.11	BTU/hr/ft ² /°F
Measured Weather Side Surface Conductance (hII):	4.21	BTU/hr/ft ² /°F
Test Specimen Thermal Conductance (C_s):	0.58	BTU/hr/ft ² /°F

Test Specimen Standardized Thermal Transmittance (U): **0.35 BTU/hr/ft²/°F**

The Condensation Resistance Factor (CRF) for the specimen was determined to be 52, which would satisfy the performance criteria of AAMA 1504-97 for a CRF class of C50. The thermal transmittance (U-Factor) of the specimen was determined to be 0.58 which would satisfy the performance criteria of AAMA 1504-97 for a U-class of U60.

Attachment 1 to this report lists the average measured surface temperatures from the two-hour evaluation period of the test. Attachment 2 to this report is an isometric drawing showing surface thermocouple measurement locations corresponding to the data on Attachment 1.

This test method does not include procedures to determine the heat flow due to either air movement through the specimen or solar radiation effects. As a consequence, the thermal transmittance results obtained do not reflect performances which may be expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that may occur due to the specific design and construction of the fenestration system opening. Therefore, it should be recognized that the thermal transmittance results obtained from this test method are for ideal laboratory conditions and should only be used for fenestration product comparisons and as input to thermal performance analyses which also include solar, air leakage, and thermal bridge effects.

Detailed drawings were available for laboratory records and compared to the test specimen at the time of this report. A copy of this report along with representative sections of the test specimen will be retained by NCTL for a period of four (4) years. The test specimen was supplied to NCTL by the above named client. The results obtained apply only to the specimen tested. This report may not be reproduced, except in full, without the written approval of National Certified Testing Laboratories. NCTL is a testing lab accredited by IAS to ISO/IEC 17025 and assumes that all information provided by the client is accurate and does not guarantee or warranty any product tested or installed. This report does not constitute certification or approval of the product, which may only be granted by a certification program validator or recognized approval entity. Testing described in this report was conducted in full compliance with AAMA 1503-09 requirements.

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NCTL DIGITAL SIGNATURE

STEVEN H. COBLE

Thermal & Simulation Manager


NCTL DIGITAL SIGNATURE

ROBERT H. ZEIDERS, P.E.

Vice-President Engineering & Quality

Person-in-Responsible Charge

SHC/amb

ATTACHMENT 1
SURFACE TEMPERATURE MEASUREMENTS

Vale Company

NCTL-110-13245-1

1800-2000

09/23/10

	<i>Thermocouple Location #</i>	<i>Individual Average Surface Temperatures (°F)</i>	
		<i>Warm Side</i>	<i>Cold Side</i>
	<i>1</i>	<i>22.8</i>	<i>8.2</i>
	<i>2</i>	<i>61.4</i>	<i>2.1</i>
	<i>3</i>	<i>61.9</i>	<i>1.8</i>
	<i>4</i>	<i>63.0</i>	<i>2.2</i>
	<i>5</i>	<i>24.4</i>	<i>14.4</i>
	<i>6</i>	<i>24.4</i>	<i>14.4</i>
	<i>7</i>	<i>22.8</i>	<i>8.2</i>
	<i>8</i>	<i>23.6</i>	<i>11.3</i>
	<i>9</i>	<i>23.6</i>	<i>11.3</i>

ATTACHMENT 3

Section 1:

Component Drawings, with Applicable Part Numbers, Manufacturing and Modeling Details,
were Reviewed (as submitted) for Product Verification
(Reference: NCTL-110-13245-1)

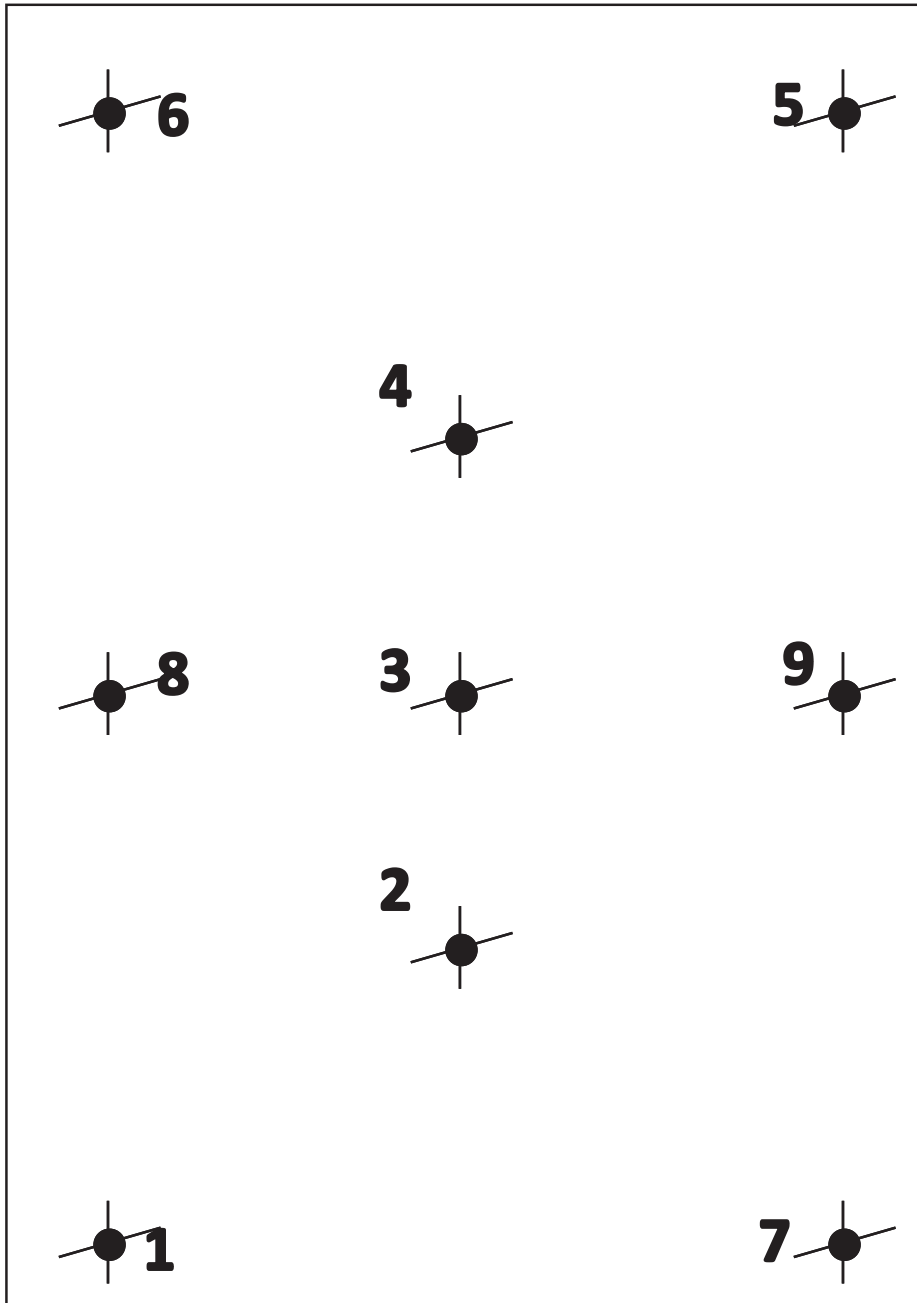
See Attached Documentation;
any deviations noted.

Note: The above referenced component drawings along with representative sections of the test specimen will be retained per procedure by NCTL. This testing facility assumes that all information provided by the client is accurate.

Section 2:

<u>Identification</u>	<u>Date</u>	<u>Page & Revision</u>
Original Issue	10/08/10	Not Applicable

ATTACHMENT 2



VALE COMPANY
NCTL-110-13245-1