



**AAMA 1503-09 THERMAL PERFORMANCE
TEST REPORT**

Rendered to:

CR LAURENCE CO., INC.

**SERIES/MODEL: IT600 Hurricane Resistant Storefront/BT601 Blast Resistant
TYPE: Glazed Wall Systems (Site-built)**

Summary of Results		
Thermal Transmittance (U-Factor)		0.46
Condensation Resistance Factor - Frame (CRF _f)		55
Condensation Resistance Factor - Glass (CRF _g)		65
Unit Size:	78-3/4" x 78-3/4"	
Layer 1:	1/4"	Clear
Gap:	0.75"	A1-D: Aluminum Spacer 100% Air*
Layer 2:	1/4"	PPG Solarban 70XL (e=0.018*, #3)

Reference must be made to Report No. E6205.02-301-46, dated 06/10/15 for complete test specimen description and data.



AAMA 1503-09 THERMAL PERFORMANCE TEST REPORT

Rendered to:

CR LAURENCE CO., INC.
2100 East 38th Street
Vernon, California 90058

Report Number: E6205.02-301-46
Test Date: 05/28/15
Report Date: 06/10/15

Test Sample Identification:

Series/Model: IT600 Hurricane Resistant Storefront/BT601 Blast Resistant Storefront

Type: Glazed Wall Systems (Site-built)

Test Sample Submitted by: Client

Test Procedure: The condensation resistance factor (CRF) and thermal transmittance (U) were determined in accordance with AAMA 1503-09, *Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections*

- | | |
|---|---------|
| 1. Average warm side ambient temperature | 69.80 F |
| 2. Average cold side ambient temperature | -0.38 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) | 55 |
| Condensation resistance factor - Glass (CRF _g) | 65 |
| 2. Thermal transmittance due to conduction (U) | 0.46 |
| (U-factors expressed in Btu/hr·ft ² ·F) | |

Test Sample Description:

Frame:

Material:	AU (0.20"): Aluminum with Thermal Improvement - All Members		
Size:	78-3/4" x 78-3/4"		
Daylight Opening:	35-3/8" x 72-3/4" (x2)	Glazing Method:	Exterior
Exterior Color:	Grey	Exterior Finish:	Paint
Interior Color:	Grey	Interior Finish:	Paint
Corner Joinery:	Square Cut / Screws / Sealed		

Glazing Information:

Layer 1:	1/4"	Clear	
Gap:	0.75"	A1-D: Aluminum Spacer	100% Air*
Layer 2:	1/4"	PPG Solarban 70XL (e=0.018*, #3)	
Gas Fill Method:	N/A*		
Desiccant:	Yes		

**Stated per Client/Manufacturer*
N/A Non-Applicable

Test Sample Description: (Continued)

Weatherstripping:

Description	Quantity	Location
No weatherstripping.		

Hardware:

Description	Quantity	Location
No hardware.		

Drainage:

Drainage Method	Size	Quantity	Location
No visible weeps.			

Test Duration:

1. The environmental systems were started at 12:34 hours, 05/27/15.
2. The thermal performance test results were derived from 02:55 hours, 05/28/15 to 06:55 hours, 05/28/15.

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	69.80 F
T_c	=	Cold side ambient air temperature	-0.38 F
FT_p	=	Average of pre-specified frame temperatures (14)	39.27 F
FT_r	=	Average of roving thermocouples (4)	29.99 F
W	=	$[(FT_p - FT_r) / (FT_p - (T_c + 10))]$ x 0.40	0.125
FT	=	$FT_p(1-W) + W (FT_r)$ = Frame Temperature	38.11 F
GT	=	Glass Temperature	45.43 F
CRF_g	=	Condensation resistance factor – Glass	65
		$CRF_g = (GT - T_c) / (T_h - T_c)$ x 100	
CRF_f	=	Condensation resistance factor – Frame	55
		$CRF_f = (FT - T_c) / (T_h - T_c)$ x 100	

The CRF number was determined to be 55 (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):

T_h	=	Average warm side ambient temperature	69.80 F
T_c	=	Average cold side ambient temperature	-0.38 F
P	=	Static pressure difference across test specimen	0.00 psf
		15 mph dynamic perpendicular wind at exterior	
Nominal sample area			43.07 ft ²
Total measured input to calorimeter			1492.32 Btu/hr
Calorimeter correction			96.66 Btu/hr
Net specimen heat loss			1395.66 Btu/hr
U	=	Thermal Transmittance	0.46 Btu/hr·ft ² ·F

Glazing Deflection:

	Left Glazing	Right Glazing
Edge Gap Width	0.75"	0.75"
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.73"	0.79"
Center gap width at laboratory ambient conditions on day of testing	0.73"	0.79"
Center gap width at test conditions	0.64"	0.79"

The sample was inspected for the formation of frost or condensation, which may influence the surface temperature measurements. The sample showed no evidence of condensation/frost at the conclusion of the test.

Prior to testing the specimen was sealed with silicone on the interior side and checked for air infiltration per Section 9.3.4.

Required annual calibrations for the Architectural Testing, Inc., a subsidiary of Intertek (Intertek-ATI), 'thermal test chamber' (ICN 004287) in Fresno, California were last conducted in April 2015 in accordance with Intertek-ATI calibration procedure. A CTS Calibration verification was performed March 2015. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed June 2014.

CRF Report

Time: 04:55 05:25 05:55 06:25 06:55 AVERAGE

Pre-specified Thermocouples - Frame

1	36.93	36.88	37.00	36.99	37.02	36.96
2	36.09	36.07	36.18	36.14	36.15	36.13
3	36.70	36.55	36.76	36.68	36.76	36.69
4	47.89	47.91	48.01	47.96	47.92	47.94
5	45.97	45.87	46.01	45.95	45.96	45.95
6	46.41	46.30	46.42	46.38	46.41	46.38
7	38.42	38.38	38.42	38.41	38.44	38.41
8	40.54	40.50	40.59	40.61	40.57	40.56
9	34.25	34.21	34.30	34.31	34.26	34.27
10	36.84	36.90	36.88	36.96	36.89	36.89
11	32.86	32.88	32.89	32.94	32.89	32.89
12	33.78	33.83	33.79	33.89	33.82	33.82
13	43.70	43.72	43.69	43.78	43.72	43.72
14	39.95	40.32	39.87	37.39	38.40	39.19
FT _p	39.31	39.31	39.34	39.17	39.23	39.27

Pre-specified Thermocouples - Glass

15	30.51	30.46	30.52	30.42	30.50	30.48
16	54.78	54.77	54.80	54.67	54.74	54.75
17	45.50	45.47	45.54	45.46	45.49	45.49
18	41.68	41.74	41.81	41.74	41.75	41.75
19	53.90	53.84	53.91	53.85	53.94	53.89
20	46.33	46.16	46.19	46.23	46.23	46.23
GT	45.45	45.41	45.46	45.40	45.44	45.43

Cold Point (Roving) Thermocouples

21	29.58	29.65	29.63	29.29	29.35	29.50
22	31.29	30.97	31.34	31.19	31.30	31.22
23	28.73	28.85	28.74	28.81	28.74	28.77
24	30.42	30.50	30.46	30.47	30.46	30.46
FT _R	30.00	29.99	30.04	29.94	29.96	29.99
W	0.13	0.13	0.13	0.12	0.13	0.13
FT	38.15	38.14	38.18	38.02	38.07	38.11

Warm Side - Room Ambient Air Temperature

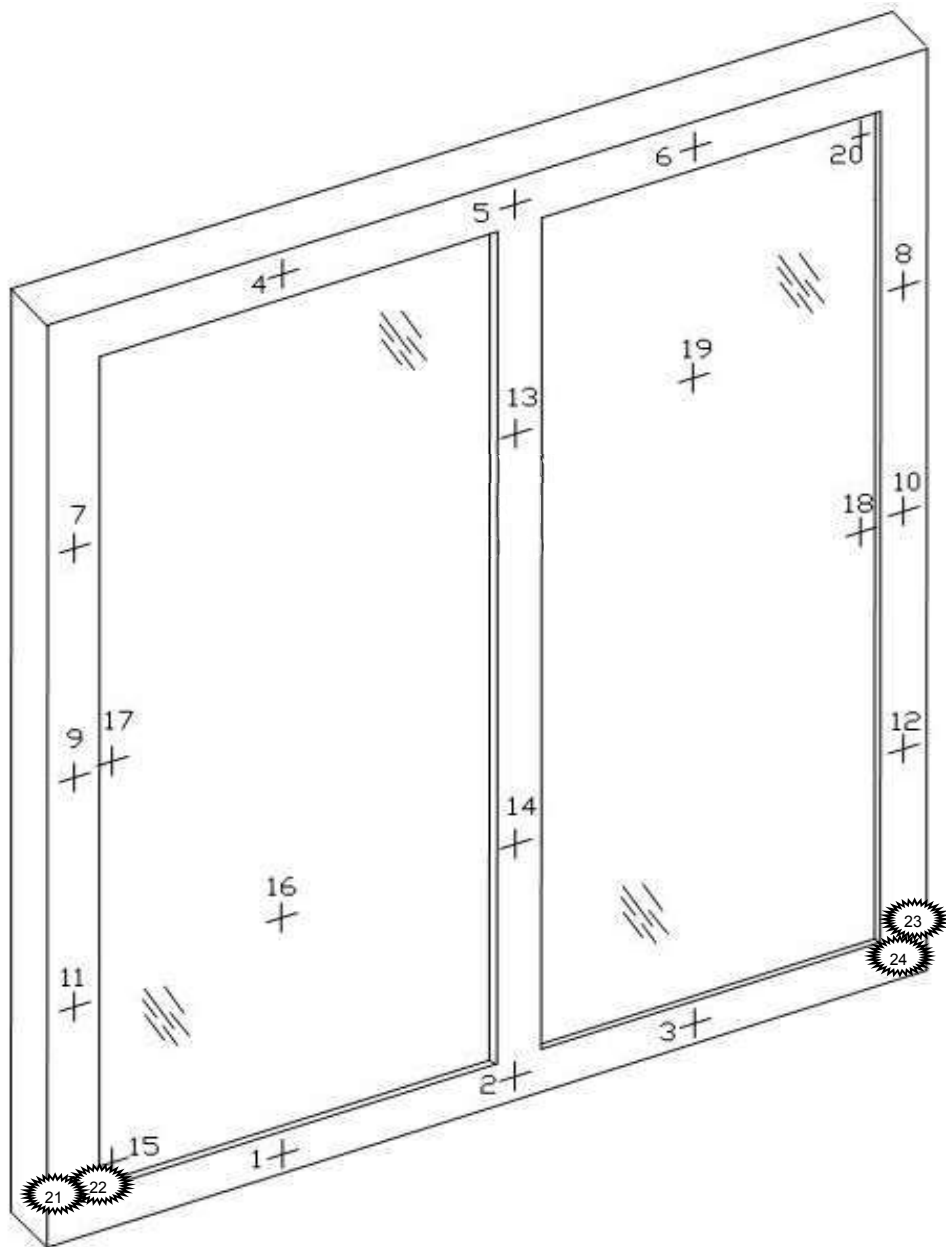
69.80 69.78 69.82 69.81 69.81 69.81

Cold Side - Room Ambient Air Temperature





-0.47 -0.33 -0.40 -0.40 -0.38 -0.39

CRF _f	55	55	55	55	55	55
CRF _g	65	65	65	65	65	65

Thermocouple Location Diagram



Cold Point Locations

	21. 29.50
	22. 31.22
	23. 28.77
	24. 30.46

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period. The test record retention end date for this report is May 28, 2019.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For INTERTEK-ATI



Digitally Signed by: William Smeds

William Simon Smeds
Technician




Digitally Signed by: Kenny C. White

Kenny C. White
Laboratory Manager
Individual-In-Responsible-Charge

WSS:ss
E6205.02-301-46

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Drawings (13)

	<p>Intertek-ATI is accredited by the International Accreditation Service (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS.</p>
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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	06/10/15	All	Original Report Issue. Work requested by Mr. Gyu-Hyeon Kim of CR Laurence Co., Inc.

This report produced from controlled document template ATI 00025(c), revised 03/14/2013.

Appendix A: Drawings

Bill of Materials

BT601 Blast Resistant Storefront

Part

Pocket Insert

Vertical Mullion

Head

Glazing Bead

Subsill

Sill

Top Load Gasket

SSG Vertical Spacer

Part Number

BR804 ✓

BR815 ✓

BR852 ✓



BR863 ✓

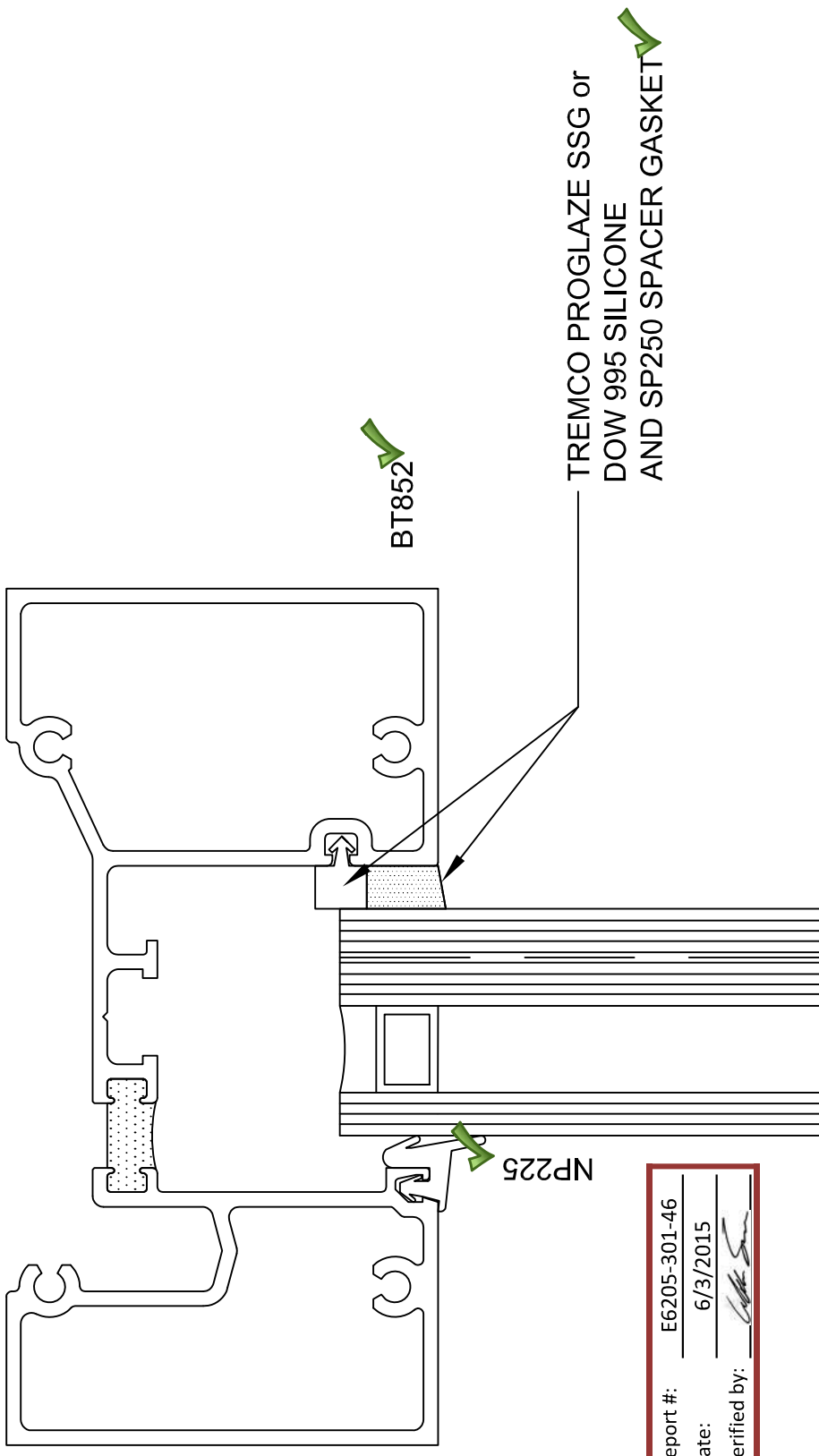
BR870 ✓

BR872 ✓

NP225 ✓

SP250 ✓

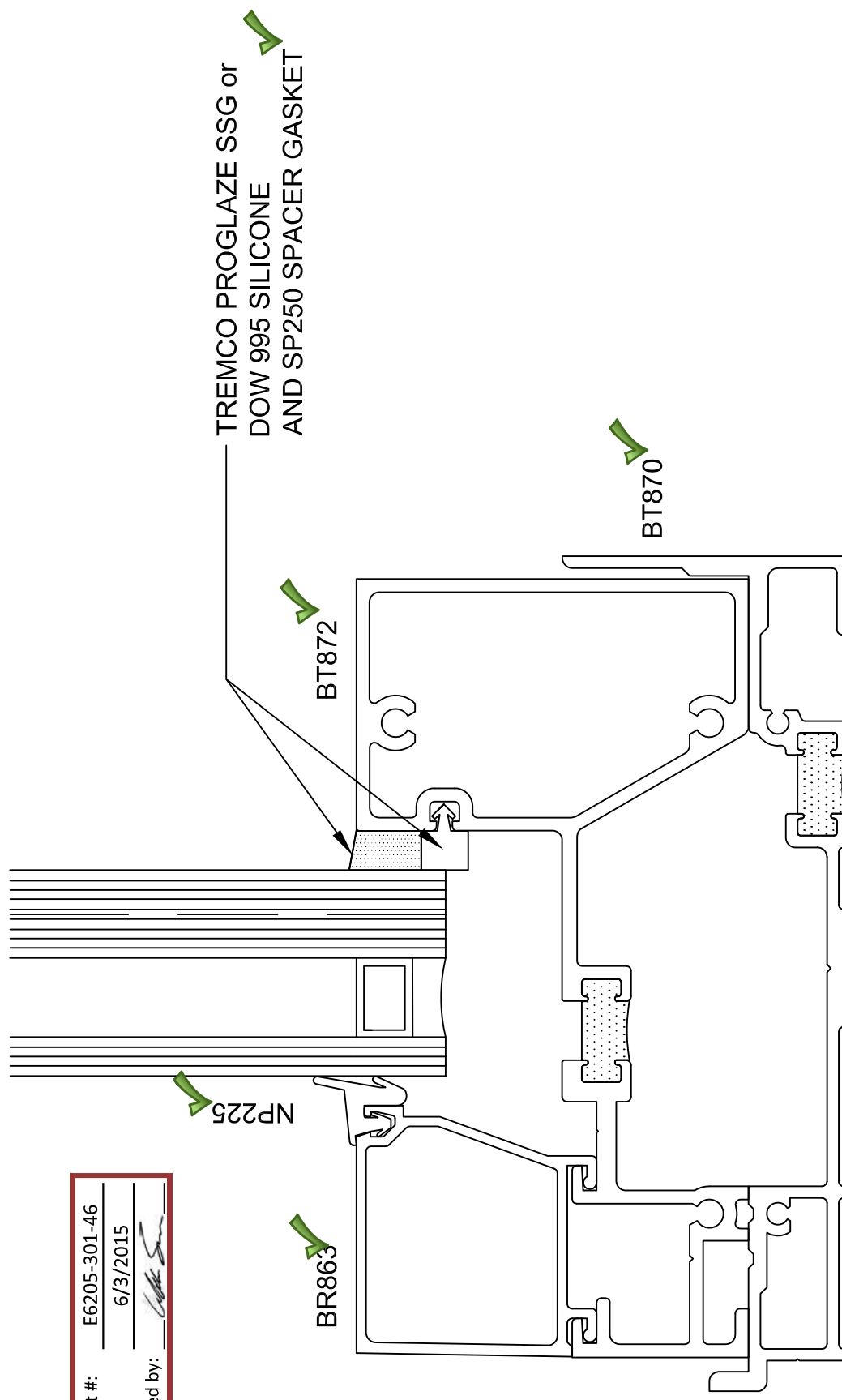
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	Verified by:	



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	Date:	6/3/2015
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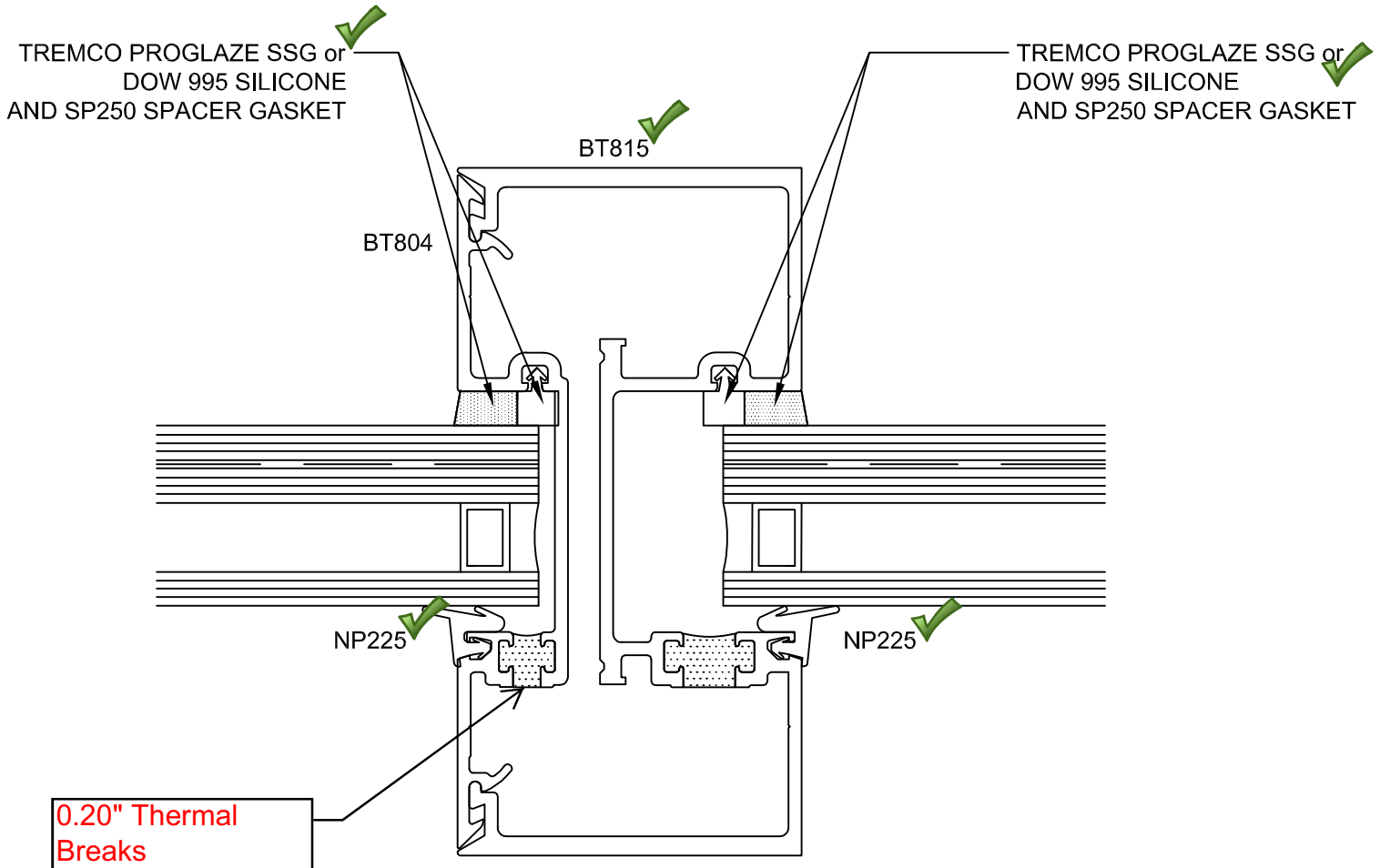
IT600 HEAD

BT852



IT600 SILL
BT872 / BR863 / BT870

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	Verified by:	



IT600 VERT. MULLION

BT815 / BT804