



NATIONAL CERTIFIED TESTING LABORATORIES

FIVE LEIGH DRIVE • YORK, PENNSYLVANIA 17406 • TELEPHONE (717) 846-1200
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NORTH EAST WINDOWS USA, INC. NFRC THERMAL TEST SUMMARY REPORT

Report No: NCTL-110-17842-3S

Test Specimen		NFRC Code
Manufacturer:	North East Windows USA, Inc.	
Series/Model:	Series "CW 300"	
Window Type:	Casement- Single Vent	CSSV
Frame Composition:	Vinyl	VY
Sash/Vent/Panel Composition:	Vinyl	VY
Thermal Break Mat'l:	Not Applicable	N
Overall Size:	610 mm (24") wide by 1499 mm (59") high	
Glazing Description	0.897" Overall w/ Low E and Argon	
No. of Glazing Layers (including films):	2	2
Primary Glazing:	Double Glazed	DG
Spacer Type:	Polycarbonate-Butyl Composite	P1-S
Gap Fill 1:	Argon (90% Single Probe)	ARG
Gap Fill 2:	Not Applicable	
Glass/Film Thicknesses (ext to int):	0.125", 0.125"	
Air Gap 1:	0.647"	
Air Gap 2:	Not Applicable	
Secondary Glazing:	Not Applicable	
Low Emissivity Coatings:		
Surface 2:	0.148	
Surface 4:	0.029	

Procedure: Standardized Thermal Transmittance (U_{st}) was determined using the NFRC 102-2014 procedure with a temperature of $69.8 \pm 0.5^\circ\text{F}$ on the room side of the specimen and $-0.4 \pm 0.5^\circ\text{F}$ on the weather side of specimen. The net air leakage across the test specimen was 0.0 cfm.

Test Results: Results of the test period 0252-0652 on 06/19/16 using the Equivalent CTS Method:

Thermal transmittance at test conditions (U_s):	0.27	BTU/hr/ft ² /°F
Standardized thermal transmittance of test specimen (U_{st}):	0.26	BTU/hr/ft ² /°F

Reference should be made to Thermal Performance Test Report Number NCTL-110-17842-3 for complete specimen description and test data.

National Certified Testing Laboratories

Performed By:

John W. Gordon
Simulation/ Thermal Manager

Reviewed By:

Raymond W. Lamb, PE
Person In Responsible Charge



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Report Number NCTL-110-17842-3
Report Date 06/30/2016
Report To North East Windows USA, Inc.
P.O Box 159
Merrick, NY 11566
Test Start Date 06/19/2016
Test End Date 06/19/2016
Specification NFRC 102-2014 "Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems"

Description of Sample Tested

Note: All dimensions are in the order (Width x Height x Thickness) unless otherwise noted.

Model/ Series "CW 300"
Configuration Casement
Frame Size Overall
610 mm x 1499 mm (24" x 59")
Frame & Vent Size 543 mm x 1445 mm (21.375" x 56.875")
Viewing Area 451 mm x 1343 mm (17.75" x 52.875")
Vent Type Extruded vinyl
Joint Construction Frame & Vent
Mitered, welded
Glazing Components
Overall 22.78 mm (0.897") Nominal
Glass Thickness (2) Lites of 3 mm (0.125") annealed glass
Coating A Comfort "E-PS" sputter-type low emissivity coating (e=0.148 per client) was applied to glazing surface no. 2. and a Comfort select "28" sputter-type low emissivity coating (e=0.029 per client) was applied to glazing surface no. 4
Spacer Type/ Size 16.4 mm (0.647") Polycarbonate-Butyl composite spacer (Type P1-S)
Fill Argon 90% single probe per client
Glazing System Interior glazed with silicon back-bedding and a single-leaf dual durometer glazing bead.
Weatherstrip
Type (1) Single-leaf vinyl wrapped foam
Location Vent perimeter

Operating Hardware**Locks**

Type Single handle 3-point integrated lock system
 Location 368 mm (14.5") From the bottom of the lock jamb

Keeper

Type Metal
 Location 140 mm (5.5") From top of the lock stile, 1267 mm (10.5") and 1775 mm (30.5") from the bottom of the lock stile

Roto-Operator

Type Standard
 Location 330 mm (13") From the lock jamb on the sill and fastened with (6) screws

Hinge Hardware

Type (3)-Bar
 Location Fastened to the head/ top rail and sill/ bottom rail

Auxiliary No auxiliary items employed

Reinforcement No reinforcement employed

Weep Description No apparent weeps employed

Interior/ Exterior

Surface Finish White vinyl (PVC)

Sealant No apparent sealant applied

Insect Screen No screen employed

Nail Fin Not applicable/ No nail fin

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. The specimen was sealed on the interior with a caulk sealant resulting in a measured net air leakage of 0.0 cfm per square foot.

TEST PARAMETERS

Tests to determine the Standardized Thermal Transmittance (U_{st}) of the specimen were performed in the guarded hot box apparatus located at the York, PA facility. The most recent calibration of the hot box apparatus was in March 09, 2016. The thermal performance evaluations were completed in accordance with the NFRC 102 procedure using a dynamic wind perpendicular to the specimen on the weather side and simulated natural convection on the room side. A zero static pressure differential (0.00 ± 0.04 " H₂O) was maintained across the specimen during the test by pressurizing the metering box on the room side. Data was collected over two successive 2 hour periods after 4 hours of steady state conditions as defined in section 6.1.2 of the NFRC 102 procedure were achieved. The test was considered completed when the data of the successive 2 hour periods also satisfied the criteria defined in section 6.1.2 of the NFRC 102 procedure.

GLASS THICKNESS AND GLAZING DEFLECTION:

	<u>Glass Thickness</u>	<u>Glazing Deflection Before Test</u>	<u>Glazing Deflection After Test</u>
Vent:	0.125", 0.125"	0.02" convex	0.048"

PROJECTED FRAME DIMENSIONS OF MEMBERS:

Member:	Head	Left Jamb	Right Jamb	Sill
Dimension:	3.25"	3.25"	3.25"	3.25"

TEST DURATION:

The test chamber environmental systems were initiated at 1137 on 06/17/16. The test conditions were considered stable for (2) consecutive (2) hour test periods from 0252-0452 and 0452-0652 on 06/19/16. The thermal performance test results were derived from the 0252-0652 test period.

Areas:

Test Specimen Projected Area (A_s):	9.85	ft ²
Test Specimen Interior Exposed (Wetted) Surface Area (A_{int}):	11.72	ft ²
Test Specimen Exterior Exposed (Wetted) Surface Area (A_{ext}):	10.53	ft ²
Metering Box Opening Area (A_{mb}):	54.39	ft ²
Metering Box Baffle Area (A_{b1}):	46.44	ft ²
Surround Panel Interior Exposed Area (A_{sp}):	44.54	ft ²

Test Conditions:

Average Room Side Air Temperature:	70.3	°F
Average Weather Side Air Temperature:	-0.7	°F
Average Guard Box Air Temperature:	72.0	°F
Average Warm Side Surround Panel Temperature:	67.4	°F
Average Cold Side Surround Panel Temperature:	0.9	°F
Metering Box Average Relative Humidity:	7.6	%
Measured Weather Side Wind Velocity:	14.3	mph
Static Pressure Difference Across Specimen:	0.46	psf

Heat Flows:

Heat Input Rate to Metering Box (Q_{total}):	365.6	BTU/hr
Surround Panel Heat Flow (Q_{sp}):	143.3	BTU/hr
Surround Panel Thickness:	4.418	Inches
Surround Panel Conductance:	0.04839	BTU/hr/ft ² /°F
Metering Box Heat Flow (Q_{mb}):	28.5	BTU/hr
Flanking Loss Heat Flow (Q_n):	7.0	BTU/hr
Net Test Specimen Heat Flow (Q_s):	186.8	BTU/hr
EMF vs Heat Flow Equation:	EMF=-227.04x + 7.000	

Test Results & Calculated Test Data:

Emittance of Glass (e_1):	0.84
Warm Side Baffle Emittance (e_{b1}):	0.96
Equivalent Room Side Surface Temperature:	55.6 °F
Equivalent Weather Side Surface Temperature:	2.6 °F
Room Side Baffle Surface Temperature:	69.7 °F
Measured Room Side Surface Conductance (h_n):	1.29 BTU/hr/ft ² /°F
Measured Weather Side Surface Conductance (h_c):	5.79 BTU/hr/ft ² /°F
Test Specimen Thermal Conductance (C_s):	0.36 BTU/hr/ft ² /°F
Convection Coefficient (K):	0.269
Radiative Test Specimen Heat Flow (Q_{r1}):	110.4 BTU/hr
Convective Test Specimen Heat Flow (Q_{c1}):	76.4 BTU/hr

Test Results & Calculated Test Data: (continued)

Radiative Heat Flux of Test Specimen (q_{r1}):	11.20	BTU/hr/ft ²
Convective Heat Flux of Test Specimen (q_{c1}):	7.75	BTU/hr/ft ²
Standardized Room Side Surface Conductance (h_{s7R}):	1.22	BTU/hr/ft ² /°F
Standardized Weather Side Surface Conductance (h_{s7C}):	5.28	BTU/hr/ft ² /°F
Test Specimen Thermal Transmittance (U_g):	0.27	BTU/hr/ft²/°F
Test Specimen Standardized Thermal Transmittance (U_{s7}):	0.26	BTU/hr/ft²/°F

No apparent condensation was observed on the test specimen at test conditions. 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. An estimate of the experimental uncertainty for these results is available upon request.

Per the client, the test specimen described in this report was a production line unit submitted for initial certification and plant qualification and is described 'as tested'. 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 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 A2LA 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. Testing described in this report was conducted in full compliance with NFRC requirements; any deviations are noted. ASTM C1363 and C1199 testing was performed with published NFRC deviations. Ratings included in this report are for submittal to an NFRC licensed IA for certification purposes and are not meant to be used for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) are to be used for labeling purposes.

National Certified Testing Laboratories

Performed By:



John W. Gordon
Technician

Reviewed By:



Raymond W. Lamb, PE
Person In Responsible Charge

ATTACHMENT 1

Section 1:

Component Drawings, with Applicable Part Numbers, Manufacturing and Modeling Details, were Reviewed (as submitted) for Product Verification (Reference: NCTL-110-17842-3)

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	06/30/16	Not Applicable

NFRC PRODUCT CERTIFICATION PROGRAM

Submittal Form for Test Samples



National Fenestration
Rating Council®

For use by Manufacturers, Lineal Suppliers and
Fabricators

1. Information on Production of the Test Sample (complete ALL fields):

Manufacturer: NORTH EAST WINDOWS USA, INC. Date of sample manufacture: 5/4/16
Plant Address where manufactured: 1 KEES PLACE
City: MERRICK State: NY Zip Code: 11566
Name of IA: ASSOCIATED LABS Phone: 244 565-0593 Fax: _____

2. Product Information (complete APPLICABLE fields):

Existing Product Line ID (CPD) No.: NEW-A-12 Product/Operator Type (Table 4-3 of NFRC 100): CASEMENT
Series/Model: CW 300

3. Test sample is being submitted for (select ONE):

- a. Validation for Initial Certification (prototype only) no plant qualification
- b. Validation for Initial Certification or Recertification (production line unit) & plant qualification
- c. Plant Qualification Only (production line unit)
- d. Test Only Alternative (production line unit) & plant qualification

I, PHILIP REIS, as the designated agent for NORTH EAST WINDOW
do hereby attest that the foregoing information is true to the best of my information, knowledge, and belief.
Further, if the unit is identified in Section 3 as a production line unit, I hereby authorize the NFRC-accredited
testing laboratory to send a copy of the test report to the IA identified above for plant qualification purposes
pursuant to the NFRC Product Certification Program.

Signature: [Signature] Date: 7/1/16

For Laboratory Use Only

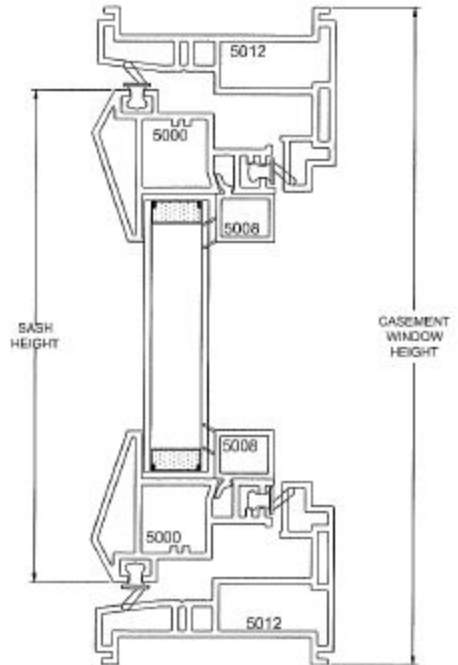
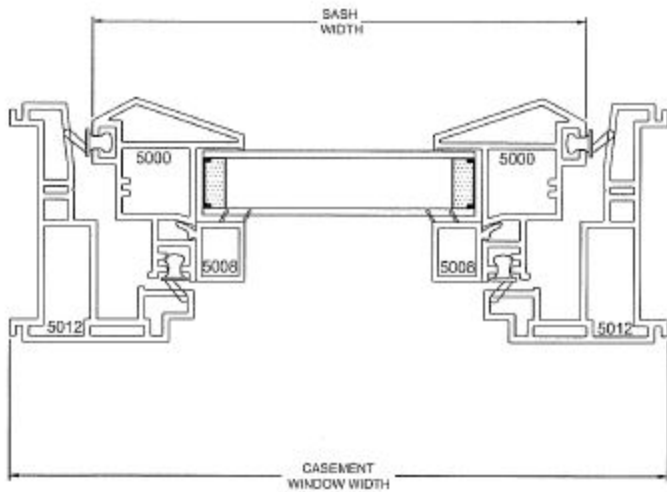
1. Laboratory: National Certified Testing Laboratories
2. Date Sample Received: 5-10-16 Test Report #: 110-17842-3
3. Date Sample Tested: 10-19-16 By: Daniel Glutfelter
4. Modifications made: _____

TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY DEVIATION IS NOTED.
NCTL-17942-3
TEST COMPLETE 4/30/16

North East CW300 Bill of Materials

<u>DWG</u>	<u>Part No.</u>
Assembly	CW300 Cross Section
Main Frame	5012
Casement Sash	5000
Glazing Bead	5008

TEST SPECIMEN COMPLIES WITH THESE DETAILS. ANY COMMENTS ARE NOTED. NCTL 17842-3 TEST COMPLETE: 4/30/16

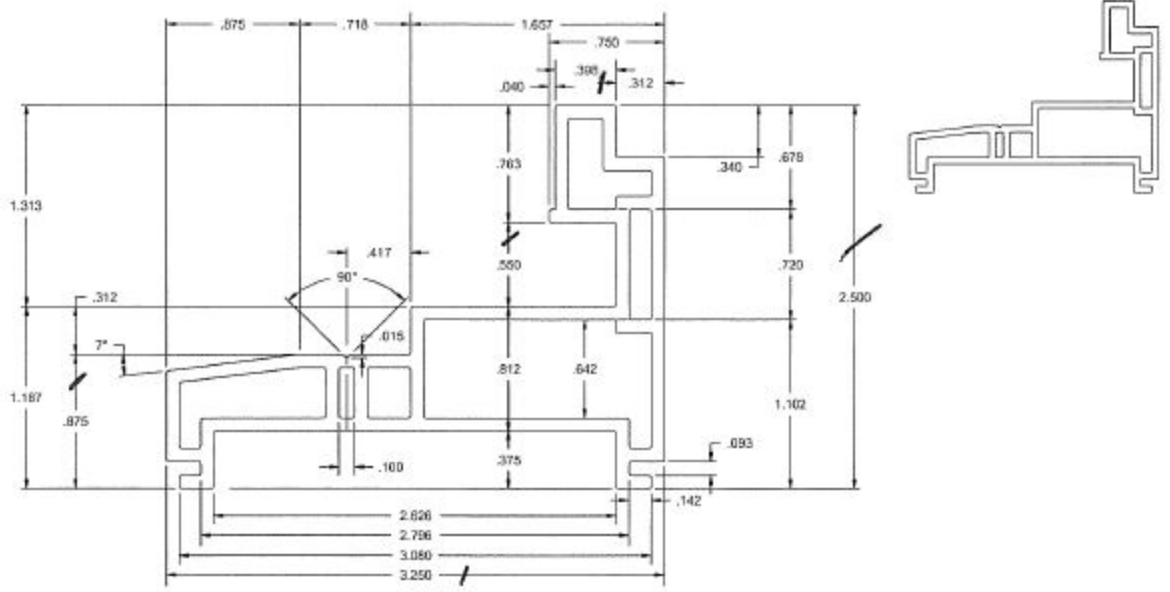


DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

	LOCATION FOR IMPACT SPECIFICATION-LENGTHS TO 38"	ALLOWABLE BOW MAX. 1" PER 14" ANGULARITY TO BE ± 1/2"	TOLERANCES- .XX ± .010 .XXX ± .005
	1) MATERIAL RIGID PVC 2) CAPSTOCK 3) UNSPECIFIED WALLS 4) BREAK ALL CORNERS 5) AREA SQ./IN. 6) WT/FT LBS/FT	TITLE CW300 WELD MAIN FRAMEWELDED SASH DWG BY DCS SCALE DATE 02/28/12 DRW BY APP'D BY DWG NO CW300 CROSS SECTION	

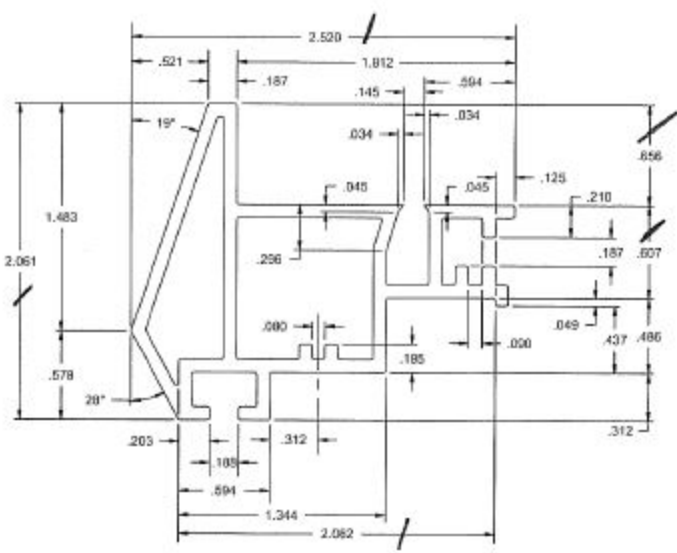
TEST SPECIMEN COMPLIES
 WITH THESE DETAILS
 ANY DIMENSIONS NOTED.
 NCTL 17442-3
 TEST COMPLETE. 6/30/12




DO NOT SCALE DRAWING

			 LOCATION FOR IMPACT SPECIFICATION-LENGTHS TO 36"		BIDDABLE BOW MAX. 1" PER 14' ANGULARITY TO BE ± 1/2°		TOLERANCES- .XX ± .010 .XXX ± .005	
					1) MATERIAL RIGID PVC 2) CAPSTOCK 3) UNSPECIFIED WALLS .080 4) BREAK ALL CORNERS .015 5) AREA 1.192 SQ.IN. 6) WT/FT		TITLE CASEMENT WINDOW CSMT MAIN FRAME DWG BY DDS SCALE 2:1 DATE 1/11/12 CHG BY APPD BY COMPUTER NO.	
NO. REVISION BY DATE			"YOUR NAME SAYS IT ALL"		DWG NO. 8.88WF-5012			

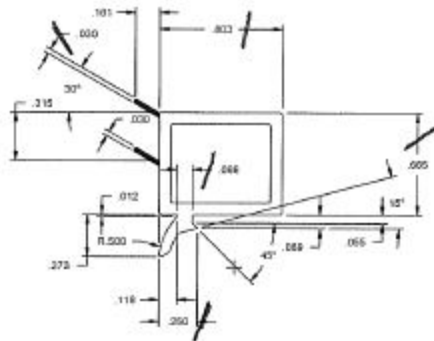
TEST SPECIMEN COMPLIES WITH THESE DETAILS. ANY PERMISSIBLE IS NOTED.
 NCTL 17042-3
 TEST COMPLETE 6/30/16



DO NOT SCALE DRAWING

LOCATION FOR IMPACT SPECIFICATION LENGTHS TO		ALLOWABLE BOW MAX. 1"	PERMANENCES - .XX
ANGLE CLARITY TO BE		$\pm 1^\circ$	$\pm .010$
DRAWN FOR  QUALITY LINEALS BY DOS DESIGNS "OUR NAME SAYS IT ALL"		1) MATERIAL RIGID PVC 2) CAPSTOCK 3) UNSPECIFIED WALLS 4) BREAK ALL CORNERS 5) AREA 6) WT/FT	TITLE CASEMENT WINDOW CASEMENT TOLERANCES $\pm .005$
NO.	REVISION	BY	DATE

TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY DIMENSIONS IS NOTED.
NCTL 17942-3
TEST COMPLETE 6/30/16



AREA OF RIGID PVC = .229
AREA OF SOFT PVC = .006

WT/FT OF RIGID PVC
WT/FT OF SOFT PVC

DO NOT SCALE DRAWING

		LOCATION FOR IMPACT SPECIFICATION-LENGTHS TO 3/8"		ALLOWABLE BOW MAX. 1" PER 14' ANGULARITY TO BE ± 1/2°		TOLERANCES- .XX ± .010 .XXX ± .005							
			1) MATERIAL RIGID PVC		TITLE CASEMENT WINDOW								
			2) CAPSTOCK		CSMT GLAZING BEAD								
		3) UNSPECIFIED WALLS .005		DRAWN BY DDS		SCALE FULL		DATE 11/14/02		DESIGNED BY		APPROVED BY	
		4) BREAK ALL CORNERS .015		5) AREA .235 SQ. IN.		COMPUTER A/C							
		6) WT/FT				DWG NO. 5008							
NO.		REVISION		BY		DATE							

TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY DEVIATION IS NOTED.
NCTL-17942-3
TEST COMPLETE 6/30/14

DuraSeal® Thermal Model Information Rev 12.1 Jan 14, 2014 for DuraSeal® Model Rev 2.03

Attached is a drawing and dimension table of DuraSeal® for thermal simulations. This document is useful for simulators and as a draft NFRC document. The dimensions found here are of the compressed product. Customers who want their windows simulated with DuraSeal should provide this document to the simulation laboratory. This should be used with the pre-drawn spacer drawing DS.dxf. Watch conductivity assignments closely to prevent confusion among the various polymers in use. Tables A & B are imperial units, tables C & D are metric dimensions.

Table A: Dimensions in inches for airspaces up to 22/48" (0.458"). Use with DS.dxf.

Gap	Code	N	BH	TL	SAW	SAH	ST	SH	AC 1	AC 2	AC 3	AC 4	AL1 / 2	SAF	IF 1	IF 2	IF 3	F
No. of blocks		2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
11/48	23H			0.229	0.206		0.171	0.194	0.113	0.168	0.168	0.090	0.198					0.012
1/4	25H			0.250	0.227		0.192	0.215	0.134	0.189	0.189	0.111	0.219					0.012
13/48	27H			0.271	0.227		0.192	0.215	0.155	0.189	0.189	0.131	0.219					0.022
14/48	29H			0.292	0.248		0.213	0.236	0.176	0.210	0.210	0.152	0.240					0.022
5/16	31H			0.313	0.269		0.234	0.257	0.197	0.231	0.231	0.173	0.261					0.022
16/48	33H			0.333	0.289		0.254	0.277	0.217	0.251	0.251	0.193	0.281					0.022
17/48	35H			0.354	0.310		0.275	0.298	0.238	0.272	0.272	0.214	0.302					0.022
3/8	37H			0.375	0.331		0.296	0.319	0.259	0.293	0.293	0.235	0.323					0.022
19/48	39H			0.396	0.352		0.317	0.340	0.280	0.314	0.314	0.256	0.344					0.022
20/48	41H			0.417	0.373		0.338	0.361	0.301	0.335	0.335	0.277	0.365					0.022
7/16	43H			0.438	0.394		0.359	0.382	0.322	0.356	0.356	0.298	0.386					0.022
22/48	45H	0.058	0.070	0.458	0.414	0.004	0.379	0.402	0.342	0.376	0.376	0.318	0.406	0.014	0.015	0.015	0.002	0.022
Fixed for all		X 0.022	X 0.007	X 0.048	X 0.004	X 0.194	X 0.018	X 0.011	X 0.022	X 0.062	X 0.072	X 0.007	X 0.015	X 0.018	X 0.062	X 0.072	X 0.011	X 0.197

Notes to Tables A, B, C & D:

1. Dimensions in bold are constant for all gap sizes in the column or group.
2. Use this dimension to complete the rectangle in boxes that show only one dimension.
3. In boxes with two numbers shown, the upper number is in the airspace dimension; the lower number is parallel to the glass.
4. 25H and 27H use the same spacer assembly – the difference in spacer width is created by using less bondline adhesive (Dimension F).
5. If you have any questions about this chart please email Douglas Hauck, Quanex Building Products, Inc. douglas.hauck@quanex.com

DuraSeal®, DuraLite®, InsulEdge® and Swiggle® Seal are registered trademarks of Quanex Building Products, Inc.

TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY INFORMATION IS NOTED.
NCTL 1742-3
TEST COMPLETE

Duraseal® Thermal Model Information Rev 12.1 Jan 14, 2014 for Duraseal® Model Rev 2.03

Table B: Dimensions in inches for airspaces 23/48" (0.479") and larger. Use with DS.dxf.

Gap	Code	N	BH	TL	SAW	SAH	ST	SH	AC 1	AC 2	AC 3	AC 4	AL1 / 2	SAF	IF 1	IF 2	IF 3	F
No. of blocks:		2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
23/48	48H			0.479	0.435		0.400	0.423	0.363	0.397	0.397	0.339	0.427					
1/2	50H			0.500	0.456		0.421	0.444	0.384	0.418	0.418	0.360	0.448					
25/48	52H			0.521	0.477		0.442	0.465	0.405	0.439	0.439	0.381	0.469					
26/48	54H			0.542	0.498		0.463	0.486	0.426	0.460	0.460	0.402	0.490					
9/16	56H			0.563	0.519		0.484	0.507	0.447	0.481	0.481	0.423	0.511					
28/48	58H			0.583	0.539		0.504	0.527	0.467	0.501	0.501	0.443	0.531					
29/48	60H			0.604	0.560		0.525	0.548	0.488	0.522	0.522	0.464	0.552					
5/8	62H			0.625	0.581		0.546	0.569	0.509	0.543	0.543	0.485	0.573					
31/48	64H			0.646	0.602		0.567	0.590	0.530	0.564	0.564	0.506	0.594					
32/48	66H			0.667	0.623		0.588	0.611	0.551	0.585	0.585	0.527	0.615					
11/16	68H	0.058	0.070	0.688	0.644	0.004	0.609	0.632	0.572	0.606	0.606	0.548	0.636	0.014	0.015	0.015	0.002	0.022
		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Up to 68:		0.022	0.007	0.048	0.004	0.209	0.018	0.012	0.022	0.069	0.080	0.007	0.015	0.018	0.069	0.080	0.012	0.213
34/48	70H			0.709	0.665		0.63	0.653	0.593	0.627	0.627	0.569	0.657					
35/48	73H			0.729	0.685		0.65	0.673	0.613	0.647	0.647	0.589	0.677					
3/4	75H			0.75	0.706		0.671	0.694	0.634	0.668	0.668	0.610	0.698					
37/48	77H			0.77	0.726		0.691	0.714	0.654	0.688	0.688	0.630	0.718					
38/48	79H			0.792	0.748		0.713	0.736	0.676	0.710	0.710	0.652	0.740					
13/16	81H	0.058	0.070	0.813	0.769	0.004	0.734	0.757	0.697	0.731	0.731	0.673	0.761	0.014	0.015	0.015	0.002	0.022
		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
70 and above:		0.022	0.007	0.043	0.004	0.244	0.018	0.013	0.022	0.084	0.094	0.007	0.015	0.018	0.084	0.094	0.013	0.243

Notes to Tables A, B, C & D:

1. Dimensions in bold are constant for all gap sizes in the column or group.
2. Use this dimension to complete the rectangle in boxes that show only one dimension.
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4. 25H and 27H use the same spacer assembly – the difference in spacer width is created by using less bondline adhesive (Dimension F).
5. If you have any questions about this chart please email Douglas Hauck, Quanex Building Products, Inc. douglas.hauck@quanex.com

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TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY VARIATION IS NOTED.
NCTL 17442-3
TEST SAMPLE 6/20/16

Duraseal® The..... Model Information Rev 12.1 Jan 14, 2014 for Duraseal® Model Rev 2.03

Table C: Dimensions in mm for airspaces up to 11.5 mm. Gaps are nominal – TL value is exact pane spacing. Use with DS.dxf

Gap	Code	N	BH	TL	SAW	SAH	ST	SH	AC 1	AC 2	AC 3	AC 4	AL1 / 2	SAF	IF 1	IF 2	IF 3	F
No. of blocks		2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
6.0	23H			5.82	5.23		4.34	4.93	2.87	4.27	4.27	2.29	5.03					0.56
6.5	25H			6.35	5.77		4.88	5.46	3.40	4.80	4.80	2.82	5.56					0.30
7.0	27H			6.88	5.77		4.88	5.46	3.94	4.80	4.80	3.33	5.56					0.56
7.5	29H			7.42	6.30		5.41	5.99	4.47	5.33	5.33	3.86	6.10					0.58
8.0	31H			7.94	6.82		5.93	6.52	4.99	5.85	5.85	4.38	6.62					0.56
8.5	33H			8.46	7.34		6.45	7.04	5.51	6.38	6.38	4.90	7.14					0.56
9.0	35H			8.99	7.87		6.99	7.57	6.05	6.91	6.91	5.44	7.67					0.56
9.5	37H			9.53	8.41		7.52	8.10	6.58	7.44	7.44	5.97	8.20					0.56
10.0	39H			10.06	8.94		8.05	8.64	7.11	7.98	7.98	6.50	8.74					0.56
10.5	41H			10.59	9.47		8.59	9.17	7.65	8.51	8.51	7.04	9.27					0.56
11.0	43H			11.11	9.99		9.11	9.69	8.17	9.03	9.03	7.56	9.79					0.56
11.5	45H	1.47	1.78	11.63	10.52	0.10	9.63	10.21	8.69	9.55	9.55	8.08	10.31	0.36	0.38	0.38	0.05	0.56
		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Fixed for all		0.56	0.18	1.22	0.10	4.93	0.46	0.28	0.56	1.57	1.83	0.18	0.38	0.46	1.57	1.83	0.28	5.00

Notes to Tables A, B, C & D:

1. Dimensions in **bold** are constant for all gap sizes in the column or group.
2. Use this dimension to complete the rectangle in boxes that show only one dimension.
3. In boxes with two numbers shown, the upper number is in the airspace dimension; the lower number is parallel to the glass.
4. 25H and 27H use the same spacer assembly – the difference in spacer width is created by using less bondline adhesive (Dimension F).
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ANY DEVIATION IS NOTED.
NCTL: ~~1111-7~~
TEST SAMPLE ID: ~~615010~~

Duraseal® Thermal Model Information Rev 12.1 Jan 14, 2014 for Duraseal® Model Rev 2.03

Table D: Dimensions in mm for airspaces 12.0 mm and larger. Gaps are nominal – TL value is exact pane spacing.

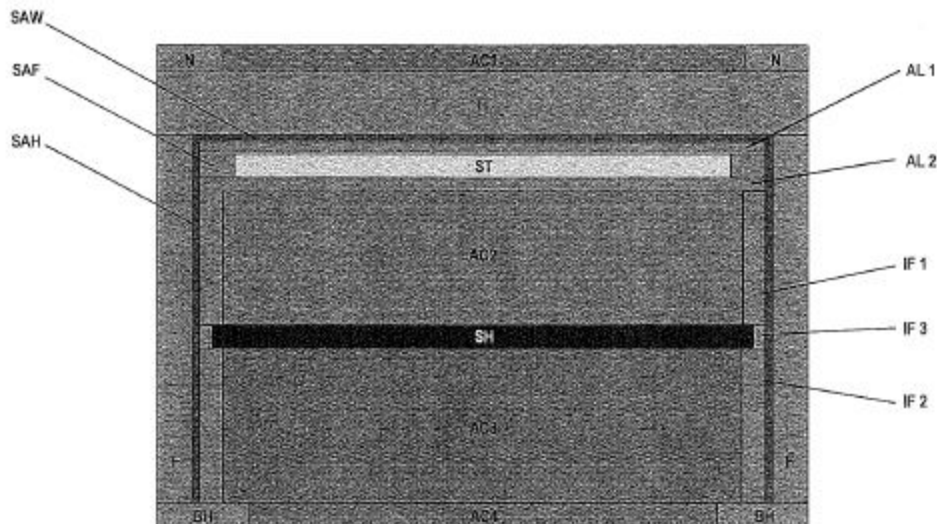
Gap	Code	N	BH	TL	SAW	SAH	ST	SH	AC 1	AC 2	AC 3	AC 4	AL1 / 2	SAF	IF 1	IF 2	IF 3	F
No. of blocks		2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
12.0	48H			12.17	11.05		10.16	10.74	9.22	10.08	10.08	8.61	10.85					
12.7	50H			12.7	11.58		10.69	11.28	9.75	10.62	10.62	9.14	11.38					
13.0	52H			13.23	12.12		11.23	11.81	10.29	11.15	11.15	9.68	11.91					
14.0	54H			13.75	12.84		11.75	12.33	10.81	11.67	11.67	10.20	12.43					
14.5	56H			14.30	13.18		12.29	12.88	11.35	12.22	12.22	10.74	12.98					
15.0	58H			14.81	13.69		12.60	13.39	11.66	12.73	12.73	11.25	13.49					
15.5	60H			15.34	14.22		13.34	13.92	12.40	13.26	13.26	11.79	14.02					
16.0	62H			15.88	14.76		13.87	14.45	12.93	13.79	13.79	12.32	14.55					
16.5	64H			16.41	15.29		14.40	14.99	13.46	14.33	14.33	12.85	15.09					
17.0	66H			16.94	15.82		14.94	15.52	14.00	14.86	14.86	13.39	15.62					
17.5	68H	1.47	1.78	17.46	16.34	0.10	15.46	16.04	14.52	15.38	15.38	13.91	16.14	0.36	0.38	0.38	0.05	0.56
		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Up to 68:		0.56	0.18	1.22	0.10	5.31	0.46	0.31	0.66	1.75	2.03	0.18	0.38	0.46	1.75	2.03	0.31	5.41
18.0	70H			18.01	16.89		16.00	16.59	15.06	15.93	15.93	14.45	16.69					
18.5	73H			18.52	17.40		16.51	17.09	15.57	16.43	16.43	14.96	17.20					
19.0	75H			19.05	17.93		17.04	17.63	16.10	16.97	16.97	15.49	17.73					
19.5	77H			19.58	18.44		17.55	18.14	16.61	17.48	17.48	16.00	18.24					
20.0	79H			20.12	19.00		18.11	18.69	17.17	18.03	18.03	16.56	18.80					
20.5	81H	1.47	1.78	20.65	19.53	0.10	18.64	19.23	17.70	18.57	18.57	17.09	19.33	0.36	0.38	0.38	0.05	0.56
		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
70 and above:		0.56	0.18	1.09	0.10	6.20	0.46	0.33	0.56	2.13	2.39	0.18	0.38	0.46	2.13	2.39	0.33	5.41

Notes to Tables A, B, C & D:

1. Dimensions in bold are constant for all gap sizes in the column or group.
2. Use this dimension to complete the rectangle in boxes that show only one dimension.
3. In boxes with two numbers shown, the upper number is in the airspace dimension; the lower number is parallel to the glass.
4. 25H and 27H use the same spacer assembly – the difference in spacer width is created by using less bondline adhesive (Dimension F).
5. If you have any questions about this chart please email Douglas Hauck, Quanex Building Products, Inc. douglas.hauck@quanex.com

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Legend



Description		Material and Conductivity	
		Imp	SI
N	71X	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
BH	71X	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
TL	71X	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
SAW	Moisture vapor barrier	Default polyethylene	Default polyethylene
SAH	Moisture vapor barrier	Default polyethylene	Default polyethylene
ST	Stiffener	Default polypropylene	Default polypropylene
SH	Shim	Default aluminum	Default aluminum
AL 1 2	Adhesive	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
AC 2	Still air	Still air – default conductivity	Default still air
AC 1 3 4	Link to respective adjacent air cavities		
SAF	Adhesive	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
IF 1 2 3	Adhesive	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
F	Adhesive	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C

If there are questions regarding this document please contact

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TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY DEVIATION IS NOTED.
NCTL 17442-3

TEST COMPLETE: 4/30/10

Duralite™ Thermal Model Information Rev 1.5 Jan 14, 2014 for Duralite™ design model Rev 1.02

Attached is a drawing and dimension table of Duralite™ for thermal simulations. This document is useful for simulators and as a draft NFRC document. The dimensions found here are of the compressed product. Customers who want their windows simulated with Duralite should provide this document to the simulation laboratory. This should be used with the pre-drawn spacer drawing DS.dxf. Watch conductivity assignments closely to prevent confusion among the various polymers in use. Tables A & B are imperial units, Tables C & D are metric dimensions.

Table A: Dimensions in inches for airspaces up to 22/48" (0.458").

Gap	Code	N	BH	TL	SAW	SAH	ST	SH	AC 1	AC 2	AC 3	AC 4	AL1 / 2	SAF	IF 1	IF 2	IF 3	F
No. of blocks		2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
1/4	25H			0.250	0.227		0.192	0.215	0.134	0.189	0.189	0.111	0.219					0.012
13/48	27H			0.271	0.227		0.192	0.215	0.155	0.189	0.189	0.131	0.219					0.022
14/48	29H			0.292	0.248		0.213	0.236	0.176	0.210	0.210	0.152	0.240					0.022
5/16	31H			0.313	0.269		0.234	0.257	0.197	0.231	0.231	0.173	0.261					0.022
16/48	33H			0.333	0.289		0.254	0.277	0.217	0.251	0.251	0.193	0.281					0.022
17/48	35H			0.354	0.310		0.275	0.298	0.238	0.272	0.272	0.214	0.302					0.022
3/8	37H			0.375	0.331		0.296	0.319	0.259	0.293	0.293	0.235	0.323					0.022
19/48	39H			0.396	0.352		0.317	0.340	0.280	0.314	0.314	0.256	0.344					0.022
20/48	41H			0.417	0.373		0.338	0.361	0.301	0.335	0.335	0.277	0.365					0.022
7/16	43H			0.438	0.394		0.359	0.382	0.322	0.356	0.356	0.298	0.386					0.022
22/48	45H	0.058	.070	0.458	0.414	0.004	0.379	0.402	0.342	0.376	0.376	0.318	0.408	0.014	0.015	0.015	0.002	0.022
Fixed for all		x 0.022	x 0.007	x 0.048	x 0.004	x 0.194	x 0.018	x 0.024	x 0.022	x 0.057	x 0.066	x 0.007	x 0.015	x 0.018	x 0.057	x 0.066	x 0.024	x 0.197

Notes to Tables A, B, C & D:

1. Dimensions in **bold** are constant for all gap sizes in the column or group.
2. Use this dimension to complete the rectangle in boxes that show only one dimension.
3. In boxes with two numbers shown, the upper number is in the airspace dimension; the lower number is parallel to the glass.
4. 25H and 27H use the same spacer assembly – the difference in spacer width is created by using less bondline adhesive (Dimension F).
5. If you have any questions about this chart please email Douglas Hauck, Quanex Building Products, Inc. douglas.hauck@quanex.com

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TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY DEVIATION IS NOTED.
NCTL 19742-3
TEST CONDITION: 6 ball

Duralite™ Thermal Model Information Rev 1.5 Jan 14, 2014 for Duralite™ design model Rev 1.02

Table B: Dimensions in inches for airspaces 23/48" (0.479") and larger.

Gap	Code	N	BH	TL	SAW	SAH	ST	SH	AC 1	AC 2	AC 3	AC 4	AL1 / 2	SAF	IF 1	IF 2	IF 3	F
No. of blocks		2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
23/48	48H			0.479	0.435		0.400	0.423	0.363	0.397	0.397	0.339	0.427					
1/2	50H			0.500	0.456		0.421	0.444	0.384	0.418	0.418	0.360	0.448					
25/48	52H			0.521	0.477		0.442	0.465	0.405	0.439	0.439	0.381	0.469					
26/48	54H			0.542	0.498		0.463	0.486	0.426	0.460	0.460	0.402	0.490					
9/16	56H			0.563	0.519		0.484	0.507	0.447	0.481	0.481	0.423	0.511					
28/48	58H			0.583	0.539		0.504	0.527	0.467	0.501	0.501	0.443	0.531					
29/48	60H			0.604	0.560		0.525	0.548	0.488	0.522	0.522	0.464	0.552					
5/8	62H			0.625	0.581		0.546	0.569	0.509	0.543	0.543	0.485	0.573					
31/48	64H			0.646	0.602		0.567	0.590	0.530	0.564	0.564	0.506	0.594					
32/48	66H			0.667	0.623		0.588	0.611	0.551	0.585	0.585	0.527	0.615					
11/16	68H	0.058	0.070	0.688	0.644	0.004	0.609	0.632	0.572	0.606	0.606	0.548	0.636	0.014	0.015	0.015	0.002	0.022
		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Up to 68:		0.022	0.007	0.048	0.004	0.209	0.018	0.023	0.022	0.064	0.074	0.007	0.015	0.018	0.064	0.074	0.023	0.213
34/48	70H			0.709	0.665		0.63	0.653	0.593	0.627	0.627	0.569	0.657					
35/48	73H			0.729	0.685		0.65	0.673	0.613	0.647	0.647	0.589	0.677					
3/4	75H			0.75	0.706		0.671	0.694	0.634	0.668	0.668	0.610	0.698					
37/48	77H			0.77	0.726		0.691	0.714	0.654	0.688	0.688	0.630	0.718					
38/48	79H			0.792	0.748		0.713	0.736	0.676	0.710	0.710	0.652	0.740					
13/16	81H	0.058	0.070	0.813	0.769	0.004	0.734	0.757	0.697	0.731	0.731	0.673	0.761	0.014	0.015	0.015	0.002	0.022
		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
70 and above:		0.022	0.007	0.043	0.004	0.244	0.018	0.024	0.022	0.079	0.088	0.007	0.015	0.018	0.079	0.088	0.024	0.243

Notes to Tables A, B, C & D:

1. Dimensions in **bold** are constant for all gap sizes in the column or group.
2. Use this dimension to complete the rectangle in boxes that show only one dimension.
3. In boxes with two numbers shown, the upper number is in the airspace dimension; the lower number is parallel to the glass.
4. 25H and 27H use the same spacer assembly – the difference in spacer width is created by using less bondline adhesive (Dimension F).
5. If you have any questions about this chart please email Douglas Hauck, Quanex Building Products, Inc. douglas.hauck@quanex.com

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ANY DEVIATION IS NOTED.
NCTL: 17442-3
TEST COMPLETE: 6/30/16

Duralite™ Thermal Model Information Rev 1.5 Jan 14, 2014 for Duralite™ design model Rev 1.02

Table C: Dimensions in mm for airspaces up to 11.5 mm. Gaps are nominal – TL value is exact pane spacing.

Gap	Code	N	BH	TL	SAW	SAH	ST	SH	AC 1	AC 2	AC 3	AC 4	AL1 / 2	SAF	IF 1	IF 2	IF 3	F
No. of blocks		2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
6.5	25H			6.35	5.77		4.88	5.46	3.40	4.80	4.80	2.82	5.56					0.30
7.0	27H			8.88	5.77		4.88	5.46	3.94	4.80	4.80	3.33	5.56					0.56
7.5	29H			7.42	6.30		5.41	5.99	4.47	5.33	5.33	3.86	6.10					0.56
8.0	31H			7.94	6.82		5.93	6.52	4.99	5.85	5.85	4.38	6.62					0.56
8.5	33H			8.46	7.34		6.45	7.04	5.51	6.38	6.38	4.90	7.14					0.56
9.0	35H			8.99	7.87		6.99	7.57	6.05	6.91	6.91	5.44	7.67					0.56
9.5	37H			9.53	8.41		7.52	8.10	6.58	7.44	7.44	5.97	8.20					0.56
10.0	39H			10.06	8.94		8.05	8.64	7.11	7.96	7.96	6.50	8.74					0.56
10.5	41H			10.59	9.47		8.59	9.17	7.65	8.51	8.51	7.04	9.27					0.56
11.0	43H			11.11	9.99		9.11	9.69	8.17	9.03	9.03	7.56	9.79					0.56
11.5	45H	1.47	1.78	11.63	10.52	0.10	9.63	10.21	8.69	9.55	9.55	8.08	10.31	0.36	0.38	0.38	0.05	0.56
Fixed for all		x 0.56	x 0.18	x 1.22	x 0.10	x 4.93	x 0.46	x 0.61	x 0.56	x 1.45	x 1.68	x 0.18	x 0.38	x 0.46	x 1.45	x 1.68	x 0.61	x 5.00

Notes to Tables A, B, C & D:

1. Dimensions in **bold** are constant for all gap sizes in the column or group.
2. Use this dimension to complete the rectangle in boxes that show only one dimension.
3. In boxes with two numbers shown, the upper number is in the airspace dimension; the lower number is parallel to the glass.
4. 25H and 27H use the same spacer assembly – the difference in spacer width is created by using less bondline adhesive (Dimension F).
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NCTL 1794-3
TEST COMPLETE: 6/20/14

Duralite™ Thermal Model Information Rev 1.5 Jan 14, 2014 for Duralite™ design model Rev 1.02

Table D: Dimensions in mm for airspaces 12.0 mm and larger. Gaps are nominal – TL value is exact pane spacing.

Gap	Code	N	BH	TL	SAW	SAH	ST	SH	AC 1	AC 2	AC 3	AC 4	AL1 / 2	SAF	IF 1	IF 2	IF 3	F
No. of blocks		2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2
12.0	48H			12.17	11.05		10.16	10.74	9.22	10.08	10.08	8.61	10.85					
12.7	50H			12.7	11.58		10.69	11.28	9.75	10.62	10.62	9.14	11.38					
13.0	52H			13.23	12.12		11.23	11.81	10.29	11.15	11.15	9.66	11.91					
14.0	54H			13.75	12.64		11.75	12.33	10.81	11.67	11.67	10.20	12.43					
14.5	56H			14.30	13.18		12.29	12.88	11.35	12.22	12.22	10.74	12.98					
15.0	58H			14.81	13.69		12.80	13.39	11.86	12.73	12.73	11.25	13.49					
15.5	60H			15.34	14.22		13.34	13.92	12.40	13.26	13.26	11.79	14.02					
16.0	62H			15.88	14.76		13.87	14.45	12.93	13.79	13.79	12.32	14.55					
16.5	64H			16.41	15.29		14.40	14.99	13.46	14.33	14.33	12.85	15.09					
17.0	66H			16.94	15.82		14.94	15.52	14.00	14.86	14.86	13.39	15.62					
17.5	68H			17.46	16.34	0.10	15.46	16.04	14.52	15.38	15.38	13.91	16.14	0.36	0.38	0.38	0.05	0.56
Up to 68:		1.47 x 0.56	1.78 x 0.18	x 1.22	x 0.10	x 5.31	x 0.46	x 0.58	x 0.56	x 1.63	x 1.88	x 0.18	x 0.38	x 0.46	x 1.63	x 1.88	x 0.58	x 5.41
18.0	70H			18.01	16.89		16.00	16.58	15.06	15.93	15.93	14.45	16.69					
18.5	73H			18.52	17.40		16.51	17.09	15.57	16.43	16.43	14.96	17.20					
19.0	75H			19.05	17.93		17.04	17.63	16.10	16.97	16.97	15.49	17.73					
19.5	77H			19.56	18.44		17.55	18.14	16.61	17.48	17.48	16.00	18.24					
20.0	79H			20.12	19.00		18.11	18.69	17.17	18.03	18.03	16.56	18.80					
20.5	81H			20.65	19.53	0.10	18.64	19.23	17.70	18.57	18.57	17.09	19.33	0.36	0.38	0.38	0.05	0.56
70 and above:		1.47 x 0.56	1.78 x 0.18	x 1.09	x 0.10	x 6.20	x 0.46	x 0.61	x 0.56	x 2.01	x 2.24	x 0.18	x 0.38	x 0.46	x 2.01	x 2.24	x 0.61	x 6.17

Notes to Tables A, B, C & D:

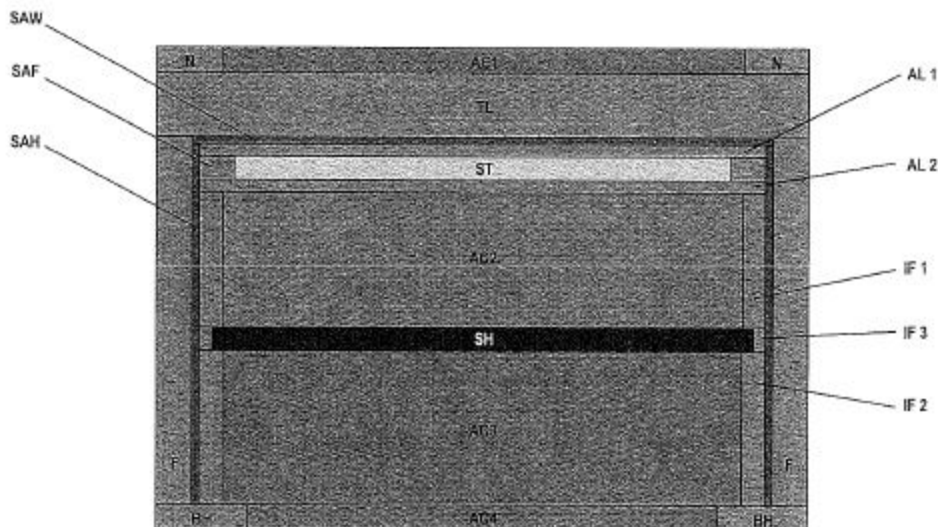
1. Dimensions in **bold** are constant for all gap sizes in the column or group.
2. Use this dimension to complete the rectangle in boxes that show only one dimension.
3. In boxes with two numbers shown, the upper number is in the airspace dimension; the lower number is parallel to the glass.
4. 25H and 27H use the same spacer assembly – the difference in spacer width is created by using less bondline adhesive (Dimension F).
5. If you have any questions about this chart please email Douglas Hauck, Quanex Building Products, Inc. douglas.hauck@quanex.com

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TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY DEVIATION IS NOTED.
NCTL-1790-3 Duralite™
TEST COMPLETE: 6/30/14

Thermal Model Information Rev 1.5 Jan 14, 2014

Legend



Description		Material and Conductivity	
		Imp	SI
N	71X	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
BH	71X	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
TL	71X	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
SAW	Moisture vapor barrier	Default polyethylene	Default polyethylene
SAH	Moisture vapor barrier	Default polyethylene	Default polyethylene
ST	Stiffener	Default polypropylene	Default polypropylene
SH	Shim	Default polycarbonate	Default polycarbonate
AL 1 2	Adhesive	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
AC 2	Still air	Still air – default conductivity	Default still air
AC 1 3 4	Link to respective adjacent air cavities		
SAF	Adhesive	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
IF 1 2 3	Adhesive	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C
F	Adhesive	Butyl 1.23 Btu in/hr ft ² °F	0.177 W/m°C

If there are questions regarding this document please contact

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