Intertek | Architectural Testing

NFRC 102-2014 THERMAL PERFORMANCE TEST REPORT

Rendered to:

NORTH EAST WINDOWS USA, INC.

SERIES/MODEL: 100 Double Hung
TYPE: Vertical Slider (Double Hung)

Summary of Results			
Standardized Thermal Transmittance (U-Factor)			0.32
Unit Size:		47-1/4" x 59" (1200 mm x 1499 mm) (Model Size)	
Layer 1:	SS	AGC Comfort Select 28 (e=0.023*, #2)	
Gap 1:	0.63"	P1-S: Duralite Spacer	90% Argon*
Layer 2:	SS	Clear	

Reference must be made to Report No. F4007.01-116-46, dated 07/01/16 for complete test specimen description and data.

NFRC 102-2014 THERMAL PERFORMANCE TEST REPORT

Rendered to:

NORTH EAST WINDOWS USA, INC.
One Kees Place P.O. Box 159
Merrick, New York 11566

Report Number:	F4007.01-116-46
Test Date:	06/09/16
Report Date:	07/01/16

Test Sample Identification:

Series/Model: 100 Double Hung

Type: Vertical Slider (Double Hung)

Overall Size: 47-1/4" x 59" (1200 mm x 1499 mm) (Model Size)
NFRC Standard Size: 47.2" x 59.1" (1200 mm wide x 1500 mm high)

Test Sample Submitted by: Client

Test Sample Submitted for: Validation for Recertification (Production Line Unit) & Plant Qualification

Test Procedure: U-Factor tests were performed in a Guarded Hot Box in accordance with NFRC 102-2014, *Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.*

Test Results Summary:

Standardized U-factor (U_{st}): 0.32 Btu/hr·ft^2·F (CTS Method)

Test Sample Description:

Frame:

Material:	VY: Vinyl		
Size:	47-1/4" x 59" (Model Size)		
Daylight Opening:	N/A	**Glazing Method:**	N/A
Exterior Color:	White	**Exterior Finish:**	Vinyl
Interior Color:	White	**Interior Finish:**	Vinyl
Corner Joinery:	Coped / Screws / Sealed		

Exterior Sash:

Material:	VY: Vinyl		
Size:	43-1/2" x 28-1/2"		
Daylight Opening:	40-1/2" x 25-1/2"	**Glazing Method:**	Channel
Exterior Color:	White	**Exterior Finish:**	Vinyl
Interior Color:	White	**Interior Finish:**	Vinyl
Corner Joinery:	Mitered / Screws / Unsealed		

Interior Sash:

Material:	VI: Vinyl with Interlock Reinforced with Vinyl		
Size:	44-1/2" x 28-1/2"		
Daylight Opening:	41-1/2" x 25-1/2"	**Glazing Method:**	Channel
Exterior Color:	White	**Exterior Finish:**	Vinyl
Interior Color:	White	**Interior Finish:**	Vinyl
Corner Joinery:	Mitered / Screws / Unsealed		

Glazing Information:

Layer 1:	SS	AGC Comfort Select 28 (e=0.023*, #2)	
Gap 1:	0.63"	P1-S: Duralite Spacer	90% Argon*
Layer 2:	SS	Clear	
Gas Fill Method:	Single-Probe Method*		

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

Test Sample Description: (Continued)

Weatherstripping:

Description	Quantity	Location
Polypile with center fin	2 rows	All stiles
Polypile with center fin	1 row	All rails and sill
Wrapped foam gasket	1 row	Bottom rail

Hardware:

Description	Quantity	Location
Metal cam sweep lock	2	Interior meeting rail
Metal keeper	2	Exterior meeting rail
Constant force balance	4	Two per jamb
Plastic tilt-latch	4	Top corners of each sash
Safety latch	2	Exterior sash stiles
Metal pivot bar	4	Bottom corners of each sash

Drainage:

Drainage Method	Size	Quantity	Location
Weepslot	0.38" x 0.19"	4	Bottom corners of each sash
Stepped sill		1	Sill

Thermal Transmittance (U-factor)

Measured Test Data

Heat Flows

1.	Total Measured Input into Metering Box (Q_{total})	509.85 Btu/hr
2.	Surround Panel Heat Flow (Q_{sp})	52.43 Btu/hr
3.	Surround Panel Thickness	4.00 inches
4.	Surround Panel Conductance	0.0461 Btu/hr·ft²·F
5.	Metering Box Wall Heat Flow (Q_{mb})	18.66 Btu/hr
6.	EMF vs Heat Flow Equation (equivalent information)	0.0331*EMF + 0.159
7.	Flanking Loss Heat Flow (Q_f)	0.34 Btu/hr
8.	Net Specimen Heat Loss (Q_s)	438.43 Btu/hr

Areas

1.	Test Specimen Projected Area (A_s)	19.36 ft²
2.	Test Specimen Interior Total (3-D) Surface Area (A_h)	22.35 ft²
3.	Test Specimen Exterior Total (3-D) Surface Area (A_c)	23.65 ft²
4.	Metering Box Opening Area (A_{mb})	36.33 ft²
5.	Metering Box Baffle Area (A_{bl})	30.99 ft²
6.	Surround Panel Interior Exposed Area (A_{sp})	16.97 ft²

Test Conditions

1.	Average Metering Room Air Temperature (t_h)	69.80 F
2.	Average Cold Side Air Temperature (t_c)	-0.39 F
3.	Average Guard/Environmental Air Temperature	72.27 F
4.	Metering Room Average Relative Humidity	3.64 %
5.	Metering Room Maximum Relative Humidity	3.71 %
6.	Metering Room Minimum Relative Humidity	3.55 %
7.	Measured Cold Side Wind Velocity (Perpendicular Flow)	12.66 mph
8.	Measured Warm Side Wind Velocity (Parallel Flow)	N/A mph
9.	Measured Static Pressure Difference Across Test Specimen	0.00" ± 0.04"H_2O

Average Surface Temperatures

1.	Metering Room Surround Panel	67.17 F
2.	Cold Side Surround Panel	0.19 F

Results

1.	Thermal Transmittance of Test Specimen (U_s)	0.32 Btu/hr·ft²·F
2.	Standardized Thermal Transmittance of Test Specimen (U_{st})	0.32 Btu/hr·ft²·F

Thermal Transmittance (U-factor)

Calculated Test Data

CTS Method

1.	Warm Side Emittance of Glass (e_1)	0.84
2.	Cold Side Emittance of Glass	0.84
3.	Warm Side Frame Emittance*	0.90
4.	Cold Side Frame Emittance*	0.90
5.	Warm Side Sash/Panel/Vent Emittance*	0.90
6.	Cold Side Sash/Panel/Vent Emittance*	0.90
7.	Warm Side Baffle Emittance (e_{b1})	0.92
8.	Cold Side Baffle Emittance (e_{b2})	N/A
9.	Equivalent Warm Side Surface Temperature	52.55 F
10.	Equivalent Cold Side Surface Temperature	4.01 F
11.	Warm Side Baffle Surface Temperature	69.37 F
12.	Cold Side Baffle Surface Temperature	N/A F
13.	Measured Warm Side Surface Conductance (h_h)	1.31 Btu/hr·ft²·F
14.	Measured Cold Side Surface Conductance (h_c)	5.14 Btu/hr·ft²·F
15.	Test Specimen Thermal Conductance (C_s)	0.47 Btu/hr·ft²·F
16.	Convection Coefficient (K_c)	0.28 Btu/(hr·ft²·F$^{1.25}$)
17.	Radiative Test Specimen Heat Flow (Q_{r1})	246.41 Btu/hr
18.	Conductive Test Specimen Heat Flow (Q_{c1})	192.02 Btu/hr
19.	Radiative Heat Flux of Test Specimen (q_{r1})	12.73 Btu/hr·ft²·F
20.	Convective Heat Flux of Test Specimen (q_{c1})	9.92 Btu/hr·ft²·F
21.	Standardized Warm Side Surface Conductance (h_{sh})	1.22 Btu/hr·ft²·F
22.	Standardized Cold Side Surface Conductance (h_{sc})	5.28 Btu/hr·ft²·F
23.	Standardized Thermal Transmittance (U_{st})	0.32 Btu/hr·ft²·F

Test Duration

1. The environmental systems were started at 16:15 hours, 06/08/16.
2. The test parameters were considered stable for two consecutive four hour test periods from 22:05 hours, 06/08/16 to 06:05 hours, 06/09/16.
3. The thermal performance test results were derived from 02:05 hours, 06/09/16 to 06:05 hours, 06/09/16.

The reported Standardized Thermal Transmittance (Ust) was determined using CTS Method, per Section 9.2(A) of NFRC 102.

**Stated per NFRC 101*

Glazing Deflection:

	Exterior Sash	Interior Sash
Edge Gap Width	0.63"	0.63"
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.75"	0.59"
Center gap width at laboratory ambient conditions on day of testing	0.75"	0.59"
Center gap width at test conditions	0.63"	0.59"

Glass collapse determined using a digital glass and air space meter

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.

"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 are expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that have the potential to occur due to the specific design and construction of the fenestration system opening. The latter can only be determined by in-situ measurements. Therefore, it is important to recognize 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."

The test sample was installed in a vertical orientation, the exterior of the specimen was exposed to the cold side. The direction of heat transfer was from the interior (warm side) to the exterior (cold side) of the specimen. The ratings were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy. The data acquisition frequency is 5 minutes.

ANSI/NCSL Z540-2-1997 type B uncertainty for this test was 2.00%.

Required annual calibrations for the Architectural Testing Inc., an Intertek company ("Intertek-ATI"), 'thermal test chamber' (ICN 000001) in York, Pennsylvania were last conducted in May 2016 in accordance with Intertek-ATI calibration procedure. A CTS Calibration verification was performed June 2016. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed May 2016.

"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."

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 June 09, 2021.

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

Tested By:

Digitally Signed by: Ryan P. Moser

Ryan P. Moser
Senior Technician

Reviewed By:

Digitally Signed by: Shon W. Einsig

Shon W. Einsig
Senior Technician
Individual-In-Responsible-Charge

RPM:pam
F4007.01-116-46

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

Appendix-A:	CTS Calibration Data (1)
Appendix-B:	Surround Panel Wiring Diagram (1)
Appendix-C:	Baffle Wiring Diagram (1)
Appendix-D:	Submittal Form and Drawings (11)

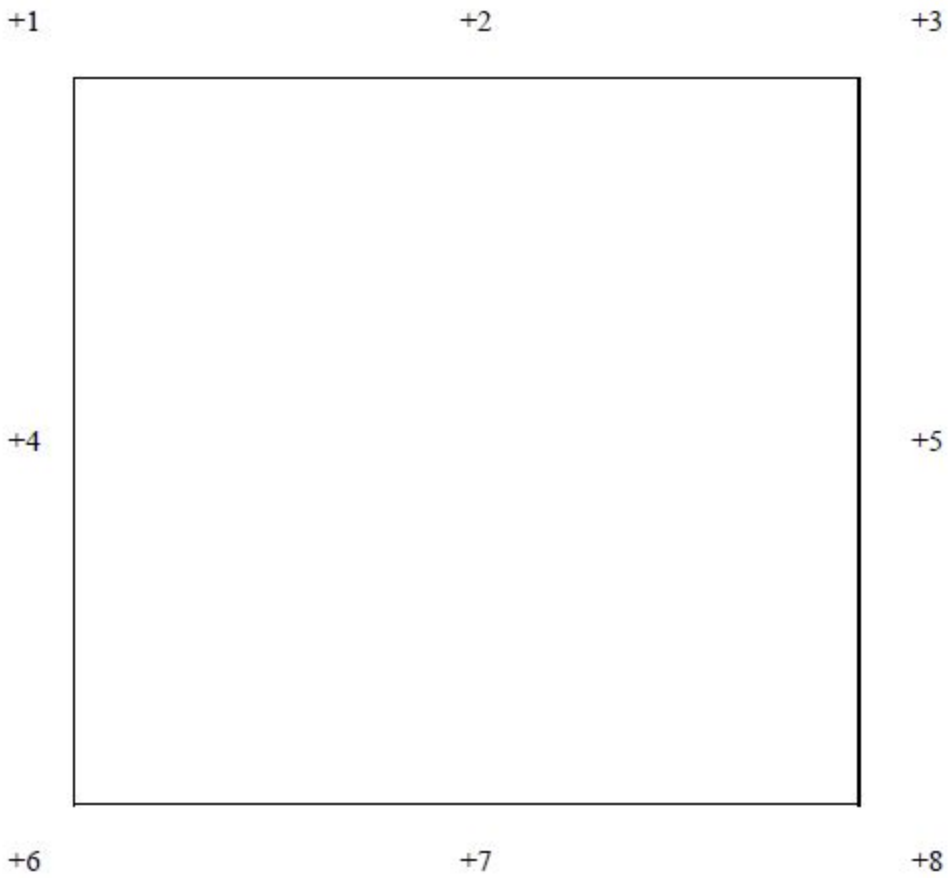
Revision Log

Rev. #	Date	Page(s)	Revision(s)
.01R0	07/01/16	All	Original Report Issue. Work requested by Phil Reid of North East Windows USA, Inc.

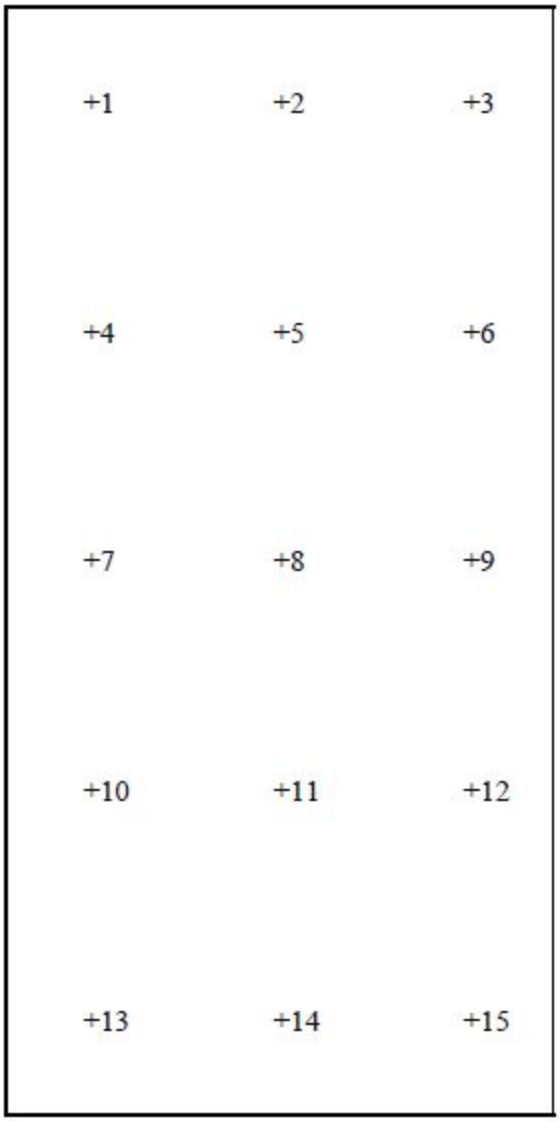
Appendix A: CTS Calibration Data

1. CTS Test Date	03/24/14	
2. CTS Size	21.53	ft^2
3. CTS Glass/Core Conductance	0.42	$Btu/hr \cdot ft^2 \cdot F$
4. Warm Side Air Temperature	69.81	F
5. Cold Side Air Temperature	-0.64	F
6. Warm Side Average Surface Temperature	53.56	F
7. Cold Side Average Surface Temperature	3.45	F
8. Convection Coefficient (K_c)	0.28	$Btu/(hr \cdot ft^2 \cdot F^{1.25})$
9. Measured Cold Side Surface Conductance (h_c)	5.14	$Btu/hr \cdot ft^2 \cdot F$
10. Measured Thermal Transmittance	0.29	$Btu/hr \cdot ft^2 \cdot F$

Appendix B: Surround Panel Wiring Diagram



Appendix C: Baffle Wiring Diagram



Appendix D: Submittal Form and Drawings

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: 6/2/16

Plant Address where manufactured: 1KEES PLACE

City: MERRICK State: NY Zip Code: 11566

Name of IA: ASSOCIATED LABS Phone: 214-565-0593 Fax: _____

2. Product Information (complete APPLICABLE fields):

Existing Product Line ID (CPD) No.: NEW-A-1 Product/Operator Type (Table 4-3 of NFRC 100): VERTICAL SLIDER

Series/Model: DH100

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 REID, as the designated agent for NORTH EAST WINDOWS USA, INC. 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.

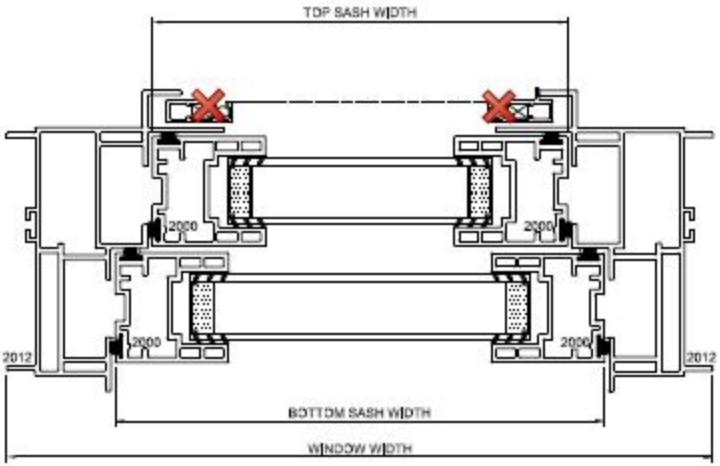
Signature: _____ Date: 6/30/16

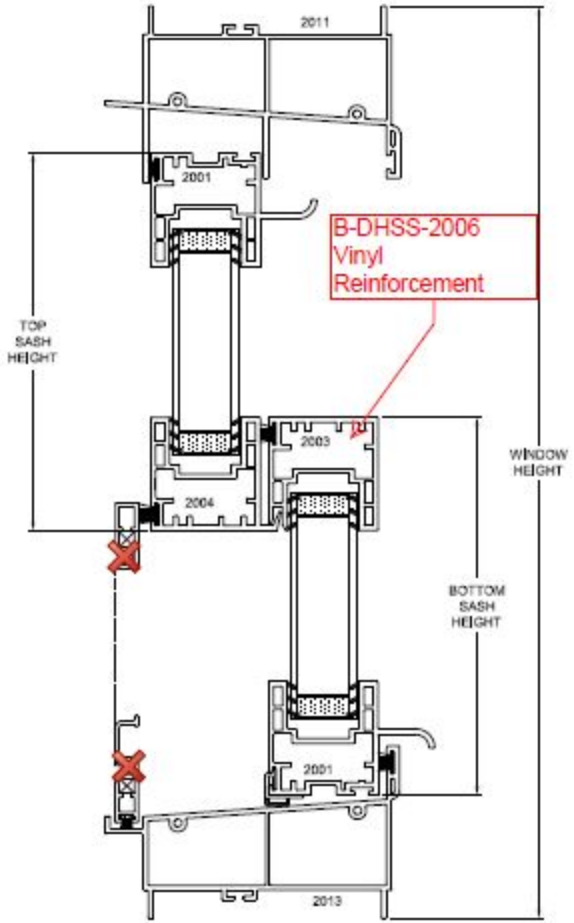
For Laboratory Use Only

1. Laboratory: Architectural testing
2. Date Sample Received: 6/6/16 Test Report #: F4007
3. Date Sample Tested: 6/9/16 By: RDm
4. Modifications made: _____

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Ryan P. Moser





DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

LOCATION FOR IMPACT ... SPECIFICATION-LENGTHS TO 3/8"

... ANGULARITY TO BE ± 1/2°

TOLERANCES- .XX ± .010 .XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL." BY CDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS
4) BREAK ALL CORNERS .015
5) AREA SQ.IN.
6) WT/FT

TITLE: SERIES DH 100 MECH MAIN FRAME/MECH SASH

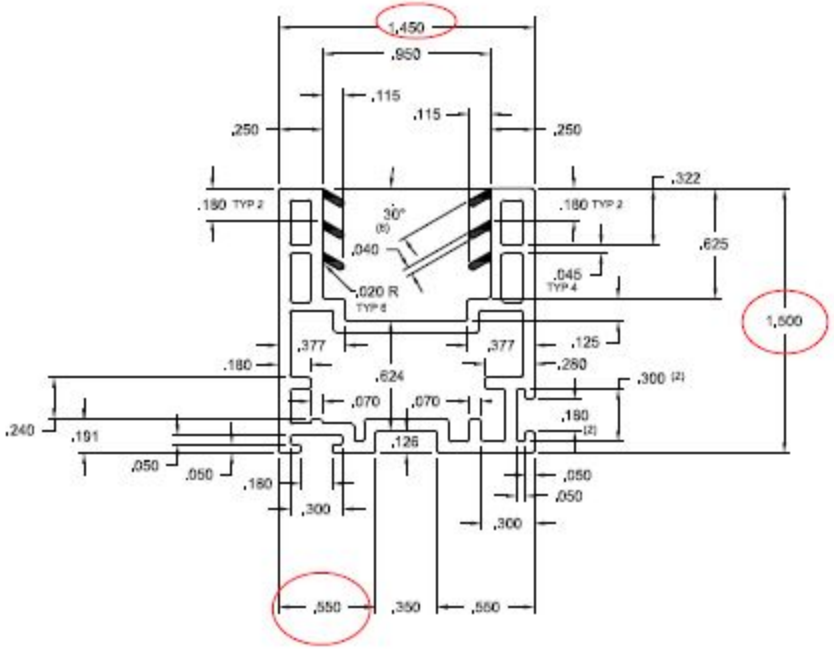
DWN BY	SCALE	DATE	CHKD BY	APPD BY
CDS	8	10/4/03		

COMPUTER NO

DWG NO C-100-DH CROSS SECTION

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Bryan P. Mercer



AREA OF RIGID PVC = .556
WT/FT OF RIGID PVC = .350

AREA OF FLEXIBLE PVC = [redacted]
WT/FT OF FLEXIBLE PVC = [redacted]

DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

LOCATION FOR IMPACT SPECIFICATION-LENGTHS TO 3/8"

DEFLECTION/BOWABLE BOW MAX, 1" PER 14'
ANGULARITY TO BE ± 1/2°

TOLERANCES- .XX ± .010
.XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL"

BY DDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS .085
4) BREAK ALL CORNERS .015
5) AREA .586 SQ.IN.
6) WT/FT [redacted]

TITLE MECHANICAL DOUBLE HUNG REGULAR SASH

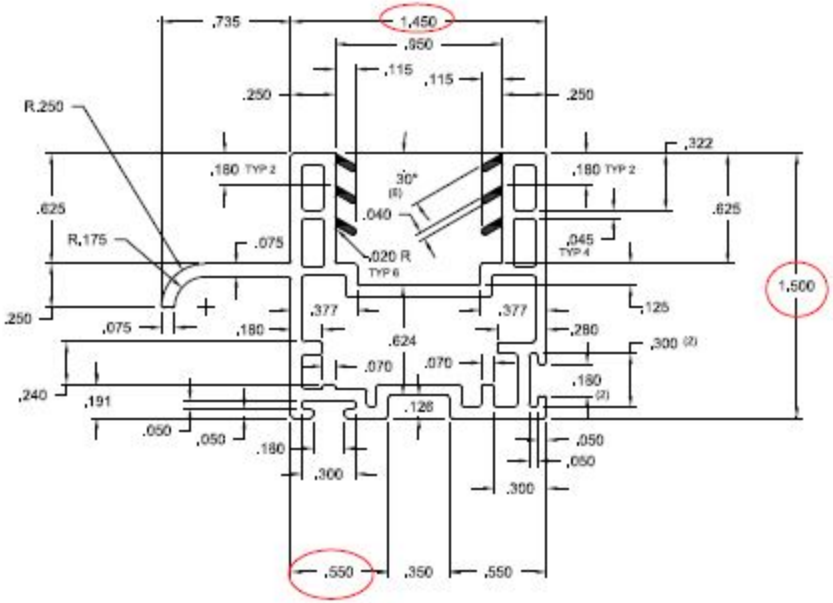
DWN BY	SCALE	DATE	CHKD BY	APPD BY
DDS	FULL	11/18/02		

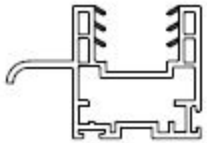
COMPUTER NO

DWG NO B-DH-2000

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Ryan P. Mercer





AREA OF RIGID PVC = .619
WT/FT OF RIGID PVC = .389

AREA OF FLEXIBLE PVC = .030
WT/FT OF FLEXIBLE PVC = .019

DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

SZ LOCATION FOR IMPACT TESTS
SPECIFICATION-LENGTHS TO 3/8" ANGULARITY TO BE ± 1/2°
WEEPABLE BOW MAX, 1" PER 14'

TOLERANCES- .XX ± .010
.XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL" BY DDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS .065
4) BREAK ALL CORNERS .015
5) AREA .649 SQ.IN.
6) WT/FT .406

TITLE MECHANICAL DOUBLE HUNG HANDLE SASH

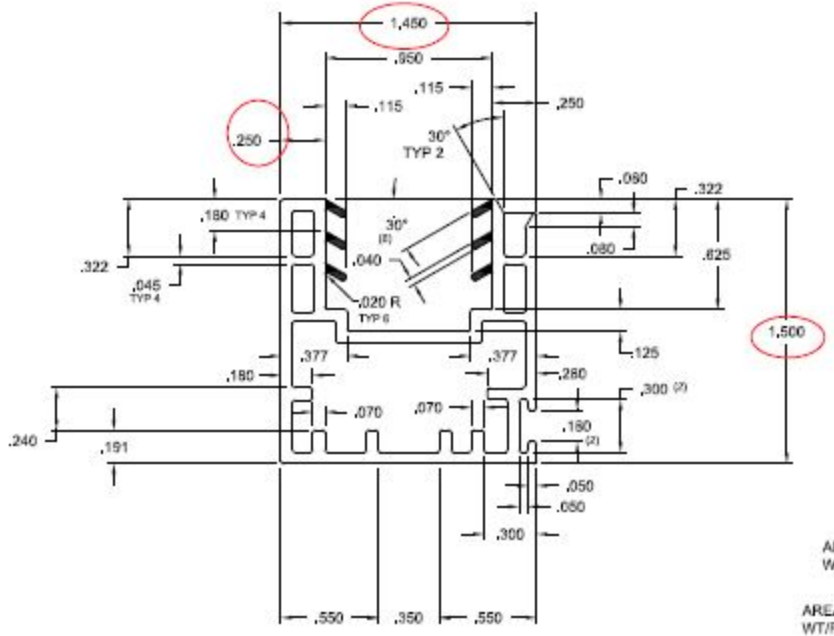
DWN BY	SCALE	DATE	CHKD BY	APPD BY
DDS	FULL	11/18/02		

COMPUTER NO

DWG NO B-DBS-2001

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Bryan P. Moser



AREA OF RIGID PVC = .535
WT/FT OF RIGID PVC = .336

AREA OF FLEXIBLE PVC = [redacted]
WT/FT OF FLEXIBLE PVC [redacted]

DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

LOCATION FOR IMPACT SPECIFICATION-LENGTHS TO 3/8"

ALLOWABLE BOW MAX, 1" PER 14' ANGULARITY TO BE ± 1/2°

TOLERANCES- .XX ± .010 .XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL"

BY DDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS .085
4) BREAK ALL CORNERS .015
5) AREA .565 SQ.IN.
6) WT/FT [redacted]

TITLE MECHANICAL DOUBLE HUNG INTERLOCK FEMAL-LOCK RAIL

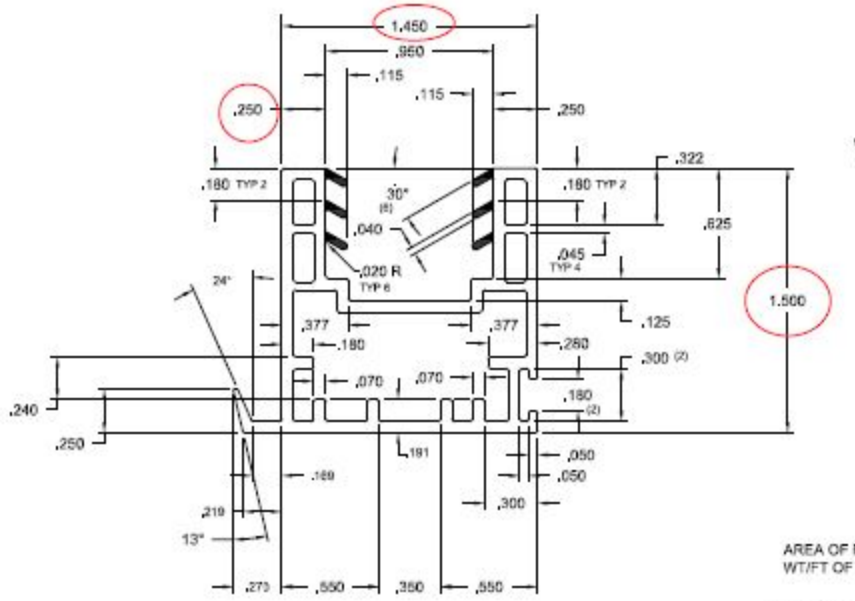
DWN BY	SCALE	DATE	CHKD BY	APPD BY
DDS	FULL	11/18/02		

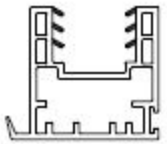
COMPUTER NO

DWG NO B-DH[redacted]2003

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Bryan P. Moser





AREA OF RIGID PVC = .574
WT/FT OF RIGID PVC = .361

AREA OF FLEXIBLE PVC =
WT/FT OF FLEXIBLE PVC =

DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

LOCATION FOR IMPACT SPECIFICATION-LENGTHS TO 3/8"

ALLOWABLE BOW MAX, 1" PER 14'
ANGULARITY TO BE ± 1/2°

TOLERANCES- .XX ± .010
.XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL"

BY DDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS .085
4) BREAK ALL CORNERS .015
5) AREA .604 SQ.IN.
6) WT/FT

TITLE MECHANICAL DOUBLE HUNG INTERLOCK MALE-KEEPER RAIL

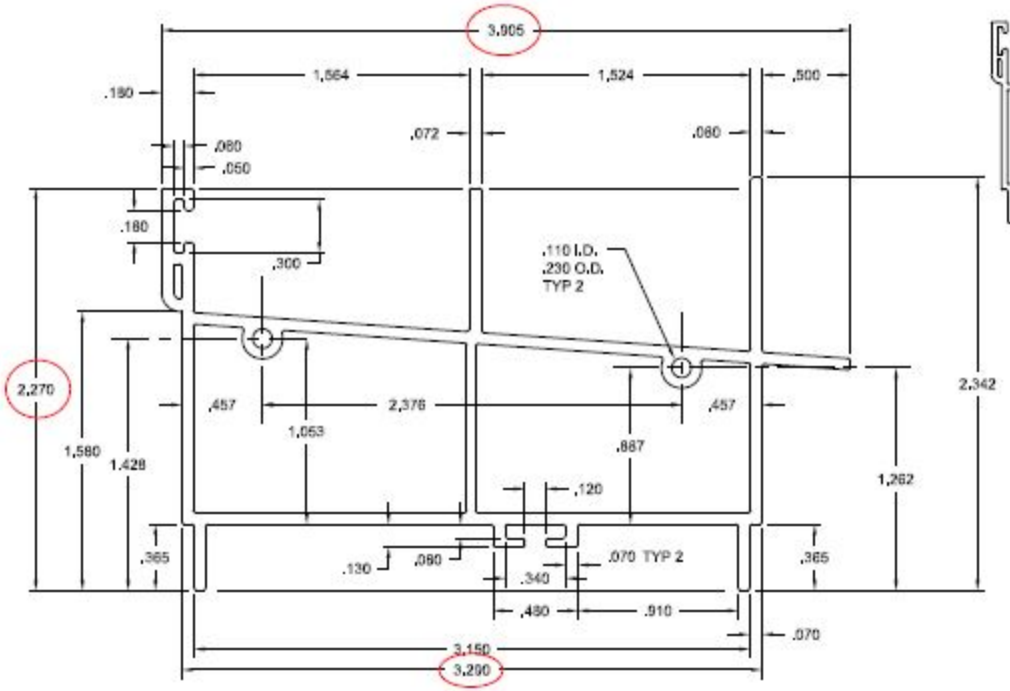
DWN BY	SCALE	DATE	CHKD BY	APPD BY
DDS	FULL	11/18/02		

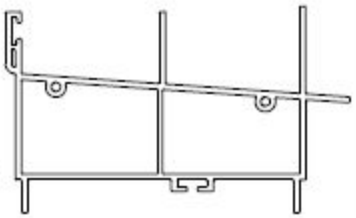
COMPUTER NO

DWG NO B-OH-LB2004

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Bryan P. Moser





DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

LOCATION FOR IMPACT SPECIFICATION-LENGTHS TO 3/8"

ALLOWABLE BOW MAX, 1" PER 14' ANGULARITY TO BE ± 1/2°

TOLERANCES- .XX ± .010 .XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL" BY DDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS .065
4) BREAK ALL CORNERS .015
5) AREA .970 SQ.IN.
6) WT/FT [redacted]

TITLE MECHANICAL DOUBLE HUNG MASTER HEAD

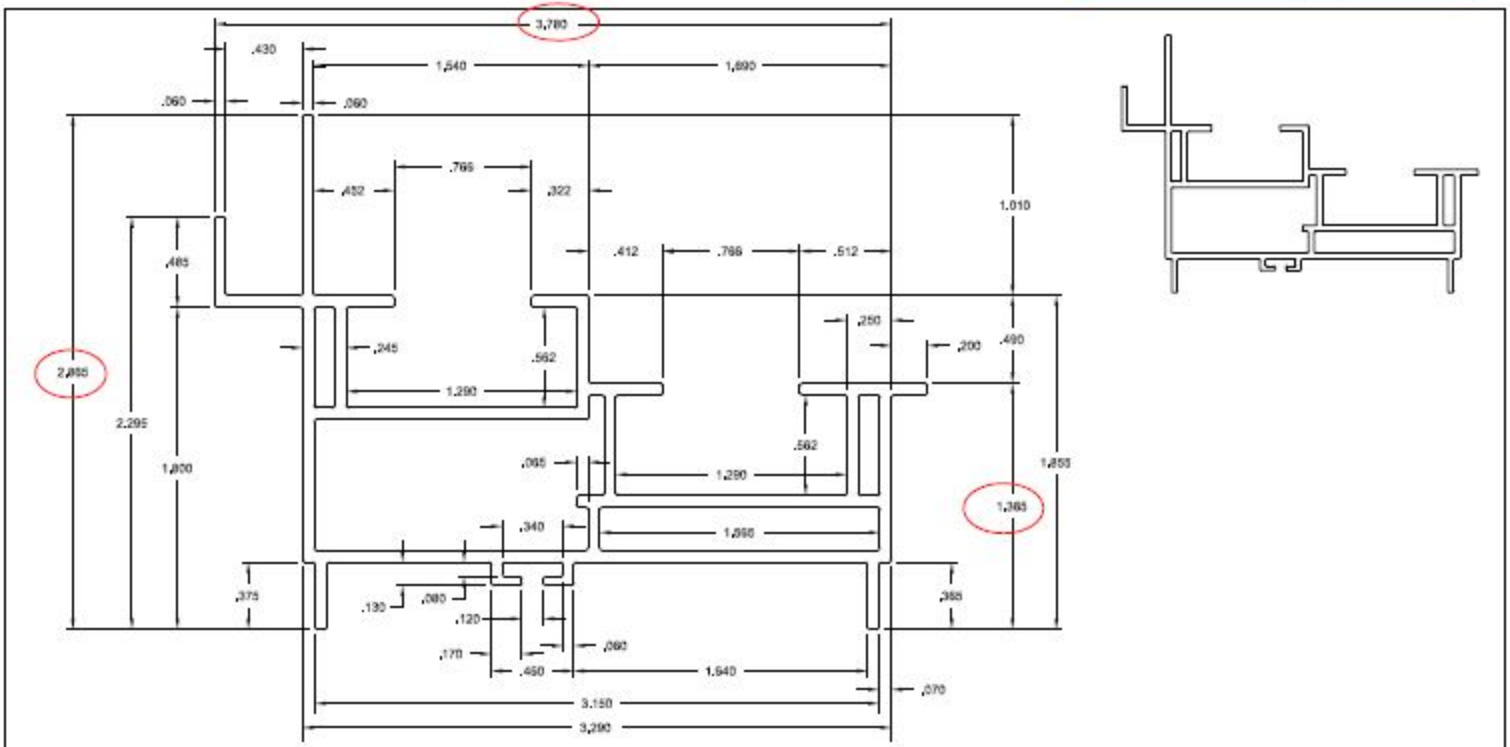
DWN BY	SCALE	DATE	CHKD BY	APPD BY
DDS	2:1	11/13/02		

COMPUTER NO

DWG NO B-D[redacted]2011

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Ryan P. Moser



DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

SZ

LOCATION FOR IMPACT AND WABLE BOW MAX. 1" PER 14'
SPECIFICATION LENGTHS TO 3/8" ANGULARITY TO BE ± 1/2°

TOLERANCES- .XX ± .010
.XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL"

BY DDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS .065
4) BREAK ALL CORNERS .015
5) AREA 1.053 SQ IN.
6) WT/FT [redacted]

TITLE MECHANICAL DOUBLE HUNG JAMB

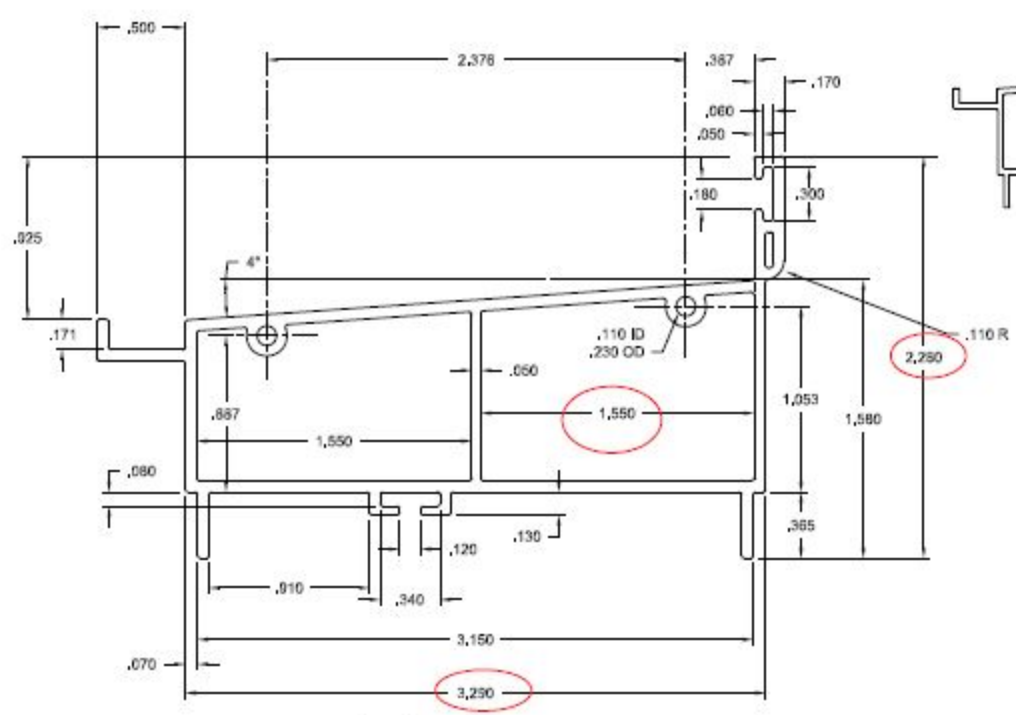
DWN BY	SCALE	DATE	CHKD BY	APPD BY
DDS	2:1	11/14/02		

COMPUTER NO

DWG NO B-DHMB2012

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Bryan P. Moser



DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

LOCATION FOR IMPACT ALLOWABLE BOW MAX, 1" PER 14'
SPECIFICATION-LENGTHS TO 3/8" ANGULARITY TO BE ± 1/2°

TOLERANCES- .XX ± .010
.XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL" BY DDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS .065
4) BREAK ALL CORNERS .015
5) AREA .853 SQ.IN.
6) WT/FT

TITLE MECHANICAL DOUBLE HUNG SILL

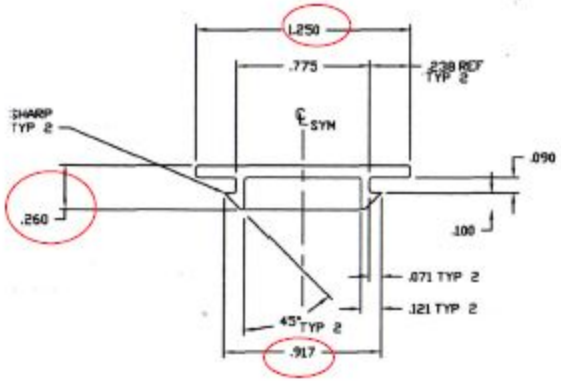
DWN BY	SCALE	DATE	CHKD BY	APPD BY
DDS	2:1	11/14/02		

COMPUTER NO

DWG NO B-1886 2013

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Ryan P. Moser



DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

LOCATION FOR IMPACT TEST
SPECIFICATION LENGTHS TO ± 3/8"

ALLOWABLE BOW MAX. 1" PER 14'
ANGULARITY TO BE ± 1/2 °

TOLERANCES - .XX ± .010
.XXX ± .005

DRAWN FOR QUALITY LINEALS "OUR NAME SAYS IT ALL" BY DDS DESIGNS

1) MATERIAL RIGID PVC
2) CAPSTOCK
3) UNSPECIFIED WALLS .070
4) BREAK ALL CORNERS .015 R
5) AREA .111 SQ. IN.
6) WT/FT [redacted] LBS/FT.

TITLE MECHANICAL DOUBLE HUNG SASH STOP

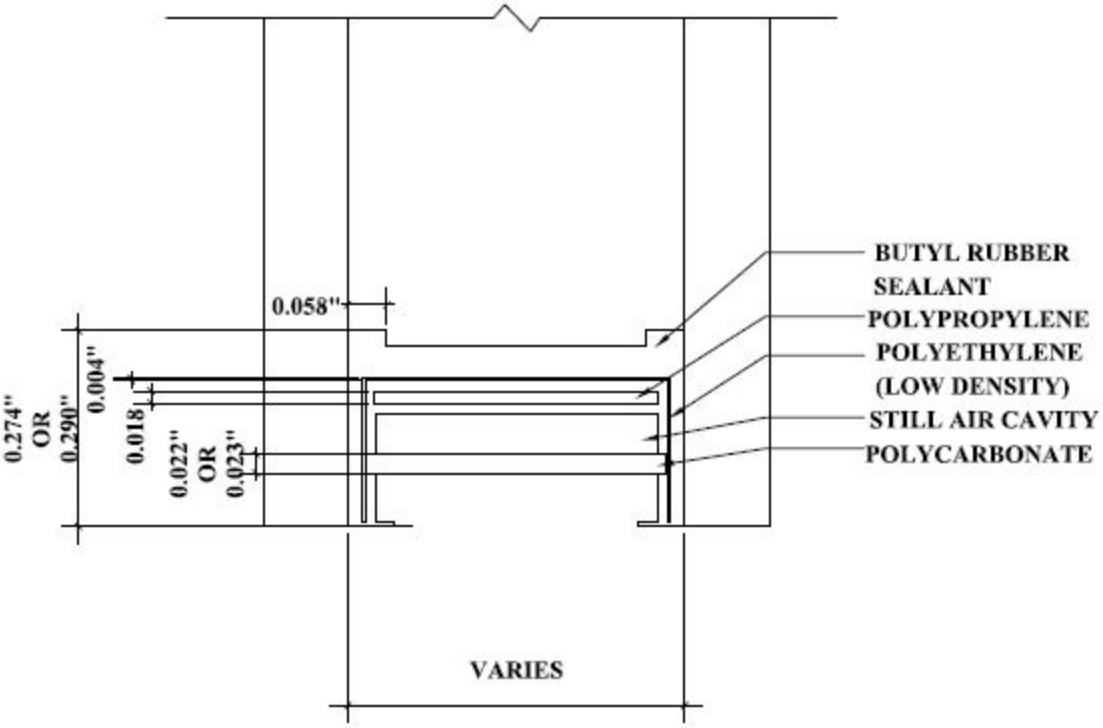
DWN BY	SCALE	DATE	CHKD BY	APPD BY
DDS	2:1	11/16/02		

COMPUTER NO

DWG NO B-DHSS-2006

Intertek

Report #: F4007-116-46
Date: 06/09/16
Verified by: Ryan P. Mercer



DETAIL FOR THERMAL MODELING OF
QUANEX DURALITE SPACER (P1-S)