

**NFRC U-FACTOR, SHGC, VT, &  
CONDENSATION RESISTANCE  
COMPUTER SIMULATION REPORT**

**Rendered to:  
NORTH EAST WINDOWS USA, INC.**

**SERIES/MODEL:  
PW4015**

**Report Number: H0197.01-116-45  
Report Date: 5/4/2017**



## NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE COMPUTER SIMULATION REPORT

Rendered to:  
NORTH EAST WINDOWS USA, INC.  
One Kees Place  
Merrick, New York 11566

Report Number: H0197.01-116-45  
Simulation Date: 5/4/2017  
Report Date: 5/4/2017

### Project Summary:

Architectural Testing, Inc., an Intertek Company (Intertek-ATI) was contracted to perform U-Factor, Solar Heat Gain Coefficient, Visible Transmittance, and Condensation Resistance\* computer simulations in accordance with the National Fenestration Rating Council (NFRC). The products were evaluated in full compliance with NFRC requirements to the standards listed

*\*NFRC's Condensation Resistance rating is NOT equivalent to a Condensation Resistance Factor (CRF) determined in accordance with AAMA 1503.*

### Standards:

*ANSI/NFRC 100-2014: Procedure for Determining Fenestration Product U-Factors*

*ANSI/NFRC 200-2014: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*

*NFRC 500-2014: Procedure for Determining Fenestration Product Condensation Resistance Values*

### Software:

**Frame and Edge Modeling:** THERM 7.4.4  
**Center-of-Glass Modeling:** WINDOW 7.4.14  
**Total Product Calculations:** WINDOW 7.4.14  
**Spectral Data Library:** IGDB 53.0

### Simulations Specimen Description:

**Series/Model:** PW4015  
**Type:** Fixed, 4-Sided  
**Frame Material:** VY Vinyl  
**Sash Material:** NA Not Applicable  
**Standard Size:** 1200mm x 1500mm

**Modeling Assumptions/Technical Interpretations:**

- 1) Dividers were not modeled per ANSI/NFRC 100-2014, Section 4.2.4.1.D.ii.

**Specialty Products Table:**

The specialty products method allow the manufacturer to determine the overall product SHGC and VT for any glazing option. The center of glass SHGC and/or VT must be determined using WINDOW 7.4.8. The method gives overall product SHGC and VT indexed on center of glass properties. All values used in the calculations are truncated to six decimal place precision.

|       | No Dividers | Dividers < 1 | Dividers > 1 |
|-------|-------------|--------------|--------------|
| SHGC0 | 0.002342    | 0.005273     | 0.008044     |
| SHGC1 | 0.865083    | 0.779034     | 0.697664     |
| VT0   | 0.000000    | 0.000000     | 0.000000     |
| VT1   | 0.862741    | 0.773761     | 0.689620     |

$$SHGC = SHGC0 + SHGCc (SHGC1 - SHGC0)$$

$$VT = VT0 + VTc (VT1 - VT0)$$

**Validation Matrix:**

The following products are part of a validation matrix. Only one is required for validation testing.

| <i>Product Line</i> | <i>Report Number</i> |
|---------------------|----------------------|
| None                | -                    |

**Spacer Option Description**

| <i>Spacer Type</i>      | <i>Sealant</i> |                  | <i>Code</i> |
|-------------------------|----------------|------------------|-------------|
|                         | <i>Primary</i> | <i>Secondary</i> |             |
| Quanex Duraseal Spacer  | Butyl Rubber   |                  | A8-S        |
| Quanex Duralite Spacer  | Butyl Rubber   |                  | P1-S        |
| Quanex nXt Super Spacer | Butyl Rubber   |                  | ZE-S        |

**Grid Option Description**

| <i>Grid Size</i> | <i>Grid Type</i>                    | <i>Grid Pattern</i> |
|------------------|-------------------------------------|---------------------|
| 3/16" x 5/8"     | Aluminum Rectangular Grid (Painted) | NFRC Standard       |

**Reinforcement Option Description**

| <i>Location</i> | <i>Material</i> |
|-----------------|-----------------|
| None            | -               |

**Gas Filling Technique Description**

| <i>Fill Type</i> | <i>Method</i>       |
|------------------|---------------------|
| 90% Argon        | Single Probe, Timed |

**Edge-of-Glass Construction**

|                           |   |
|---------------------------|---|
| <i>Interior Condition</i> | Rigid PVC Glazing Bead with Flexible Fin Against Glass  |
| <i>Exterior Condition</i> | Foam Weatherstripping Between Rigid PVC Frame and Glass |

**Weatherstripping**

| <i>Type</i> | <i>Quantity</i> | <i>Location</i> |
|-------------|-----------------|-----------------|
| None        | -               | -               |

**Frame/Sash Materials Finish**

|                 |       |
|-----------------|-------|
| <i>Interior</i> | Vinyl |
| <i>Exterior</i> | Vinyl |

**NFRC 100/200/500 Summary Sheet  
PW4015**

| ID | Pane Thickness 1                                     | Gap Width 1 | Pane Thickness 2 | Gap Width 2   | Pane Thickness 3 | Gap Width 3 | Pane Thickness 4 | Gap Fill  | Low-e (Surface#) | Tint | Spacer                  | Grid Type |
|----|--|-------------|------------------|---|------------------|-------------|------------------|---|------------------|------|-------------------------|-----------|
|    | U-Factor   |             |                  | Solar Heat Gain Coefficient (SHGC)<br>Grids (None / <1 / >=1) |                  |             |                  | Visible Transmittance (VT)<br>Grids (None / <1 / >=1) |                  |      | Condensation Resistance |           |
| 1  | No Foam: CS36 / AIR / CLR (2MM/2MM) - 7/8" IG        |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.090  | 0.688       | 0.086            |   |                  |             |                  | AIR   | 0.027(#2)        | CL   | A8-S                    | N,G       |
|    | U-Factor 0.32  |             |                  | SHGC (N / <1) 0.32 / 0.29                                     |                  |             |                  | VT (N / <1) 0.58 / 0.52                               |                  |      | CR 57                   |           |
|    | No Foam: CS36 / AIR / CLR (3MM/3MM) - 7/8" IG        |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.128  | 0.625       | 0.123            |   |                  |             |                  | AIR   | 0.027(#2)        | CL   | A8-S                    | N,G       |
|    | U-Factor 0.32  |             |                  | SHGC (N / <1) 0.31 / 0.29                                     |                  |             |                  | VT (N / <1) 0.57 / 0.51                               |                  |      | CR 57                   |           |
| 2  | No Foam: CS36 / ARG90 / CLR (2MM/2MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.090  | 0.688       | 0.086            |   |                  |             |                  | ARG90   | 0.027(#2)        | CL   | A8-S                    | N,G       |
|    | U-Factor 0.28  |             |                  | SHGC (N / <1) 0.31 / 0.29                                     |                  |             |                  | VT (N / <1) 0.58 / 0.52                               |                  |      | CR 60                   |           |
|    | No Foam: CS36 / ARG90 / CLR (3MM/3MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.128  | 0.625       | 0.123            |   |                  |             |                  | ARG90   | 0.027(#2)        | CL   | A8-S                    | N,G       |
|    | U-Factor 0.28  |             |                  | SHGC (N / <1) 0.31 / 0.28                                     |                  |             |                  | VT (N / <1) 0.57 / 0.51                               |                  |      | CR 60                   |           |
| 3  | No Foam: RLE 71/38 / ARG90 / CLR (2MM/2MM) - 7/8" IG |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.090  | 0.688       | 0.090            |   |                  |             |                  | ARG90   | 0.027(#2)        | CL   | A8-S                    | N,G       |
|    | U-Factor 0.28  |             |                  | SHGC (N / <1) 0.34 / 0.31                                     |                  |             |                  | VT (N / <1) 0.62 / 0.55                               |                  |      | CR 60                   |           |
|    | No Foam: RLE 71/38 / ARG90 / CLR (3MM/3MM) - 7/8" IG |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.117  | 0.625       | 0.117            |   |                  |             |                  | ARG90   | 0.027(#2)        | CL   | A8-S                    | N,G       |
|    | U-Factor 0.28  |             |                  | SHGC (N / <1) 0.34 / 0.30                                     |                  |             |                  | VT (N / <1) 0.61 / 0.55                               |                  |      | CR 60                   |           |
| 4  | No Foam: E366 / ARG90 / CLR (2MM/2MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.087  | 0.688       | 0.087            |   |                  |             |                  | ARG90   | 0.022(#2)        | CL   | A8-S                    | N,G       |
|    | U-Factor 0.28  |             |                  | SHGC (N / <1) 0.24 / 0.22                                     |                  |             |                  | VT (N / <1) 0.56 / 0.51                               |                  |      | CR 61                   |           |
|    | No Foam: E366 / ARG90 / CLR (3MM/3MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.117  | 0.625       | 0.118            |   |                  |             |                  | ARG90   | 0.022(#2)        | CL   | A8-S                    | N,G       |
|    | U-Factor 0.28  |             |                  | SHGC (N / <1) 0.24 / 0.22                                     |                  |             |                  | VT (N / <1) 0.56 / 0.50                               |                  |      | CR 61                   |           |
| 5  | No Foam: CLR / AIR / CLR (3MM/3MM) - 7/8" IG         |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.123  | 0.625       | 0.123            |   |                  |             |                  | AIR   |                  | CL   | P1-S                    | N,G       |
|    | U-Factor 0.47  |             |                  | SHGC (N / <1) 0.68 / 0.61                                     |                  |             |                  | VT (N / <1) 0.71 / 0.64                               |                  |      | CR 44                   |           |
| 6  | No Foam: CS36 / AIR / CLR (2MM/2MM) - 7/8" IG        |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.090  | 0.688       | 0.086            |   |                  |             |                  | AIR   | 0.027(#2)        | CL   | P1-S                    | N,G       |
|    | U-Factor 0.31  |             |                  | SHGC (N / <1) 0.32 / 0.29                                     |                  |             |                  | VT (N / <1) 0.58 / 0.52                               |                  |      | CR 60                   |           |

**NFRC 100/200/500 Summary Sheet  
PW4015**

| ID | Pane Thickness 1                                     | Gap Width 1 | Pane Thickness 2 | Gap Width 2   | Pane Thickness 3 | Gap Width 3 | Pane Thickness 4 | Gap Fill  | Low-e (Surface#)      | Tint | Spacer                  | Grid Type |
|----|--|-------------|------------------|---|------------------|-------------|------------------|---|-----------------------|------|-------------------------|-----------|
|    | U-Factor   |             |                  | Solar Heat Gain Coefficient (SHGC)<br>Grids (None / <1 / >=1) |                  |             |                  | Visible Transmittance (VT)<br>Grids (None / <1 / >=1) |                       |      | Condensation Resistance |           |
|    | No Foam: CS36 / AIR / CLR (3MM/3MM) - 7/8" IG        |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.128  | 0.625       | 0.123            |   |                  |             |                  | AIR   | 0.027(#2)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.31  |             |                  | SHGC (N / <1) 0.31 / 0.29                                     |                  |             |                  | VT (N / <1) 0.57 / 0.51                               |                       |      | CR 60                   |           |
| 7  | No Foam: RLE 71/38 / AIR / CLR (2MM/2MM) - 7/8" IG   |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.090  | 0.688       | 0.090            |   |                  |             |                  | AIR   | 0.027(#2)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.31  |             |                  | SHGC (N / <1) 0.34 / 0.31                                     |                  |             |                  | VT (N / <1) 0.62 / 0.55                               |                       |      | CR 60                   |           |
|    | No Foam: RLE 71/38 / AIR / CLR (3MM/3MM) - 7/8" IG   |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.117  | 0.625       | 0.117            |   |                  |             |                  | AIR   | 0.027(#2)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.31  |             |                  | SHGC (N / <1) 0.34 / 0.31                                     |                  |             |                  | VT (N / <1) 0.61 / 0.55                               |                       |      | CR 60                   |           |
| 8  | No Foam: E366 / AIR / CLR (2MM/2MM) - 7/8" IG        |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.087  | 0.688       | 0.087            |   |                  |             |                  | AIR   | 0.022(#2)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.31  |             |                  | SHGC (N / <1) 0.24 / 0.22                                     |                  |             |                  | VT (N / <1) 0.56 / 0.51                               |                       |      | CR 60                   |           |
|    | No Foam: E366 / AIR / CLR (3MM/3MM) - 7/8" IG        |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.117  | 0.625       | 0.118            |   |                  |             |                  | AIR   | 0.022(#2)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.31  |             |                  | SHGC (N / <1) 0.24 / 0.22                                     |                  |             |                  | VT (N / <1) 0.56 / 0.50                               |                       |      | CR 60                   |           |
| 9  | No Foam: CLR / ARG90 / CS28 (2MM/2MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.086  | 0.688       | 0.087            |   |                  |             |                  | ARG90   | 0.023(#3)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.34 / 0.31                                     |                  |             |                  | VT (N / <1) 0.55 / 0.50                               |                       |      | CR 64                   |           |
| 10 | No Foam: CS28 / ARG90 / CS73 (2MM/2MM) - 7/8" IG     |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.087  | 0.688       | 0.087            |   |                  |             |                  | ARG90   | 0.023(#2) / 0.148(#4) | CL   | P1-S                    | N,G       |
|    | U-Factor 0.22  |             |                  | SHGC (N / <1) 0.23 / 0.21                                     |                  |             |                  | VT (N / <1) 0.51 / 0.46                               |                       |      | CR 52                   |           |
| 11 | No Foam: CS36 / ARG90 / CLR (2MM/2MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.090  | 0.688       | 0.086            |   |                  |             |                  | ARG90   | 0.027(#2)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.31 / 0.29                                     |                  |             |                  | VT (N / <1) 0.58 / 0.52                               |                       |      | CR 64                   |           |
|    | No Foam: CS36 / ARG90 / CLR (3MM/3MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.128  | 0.625       | 0.123            |   |                  |             |                  | ARG90   | 0.027(#2)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.31 / 0.28                                     |                  |             |                  | VT (N / <1) 0.57 / 0.51                               |                       |      | CR 64                   |           |
| 12 | No Foam: RLE 70/36 / ARG90 / CLR (2MM/2MM) - 7/8" IG |             |                  |   |                  |             |                  |   |                       |      |                         |           |
|    | 0.090  | 0.688       | 0.090            |   |                  |             |                  | ARG90   | 0.036(#2)             | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.33 / 0.30                                     |                  |             |                  | VT (N / <1) 0.61 / 0.55                               |                       |      | CR 63                   |           |

**NFRC 100/200/500 Summary Sheet  
PW4015**

| ID | Pane Thickness 1                                     | Gap Width 1 | Pane Thickness 2 | Gap Width 2   | Pane Thickness 3 | Gap Width 3 | Pane Thickness 4 | Gap Fill  | Low-e (Surface#) | Tint | Spacer                  | Grid Type |
|----|--|-------------|------------------|---|------------------|-------------|------------------|---|------------------|------|-------------------------|-----------|
|    | U-Factor   |             |                  | Solar Heat Gain Coefficient (SHGC)<br>Grids (None / <1 / >=1) |                  |             |                  | Visible Transmittance (VT)<br>Grids (None / <1 / >=1) |                  |      | Condensation Resistance |           |
|    | No Foam: RLE 70/36 / ARG90 / CLR (3MM/3MM) - 7/8" IG |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.117  | 0.625       | 0.117            |   |                  |             |                  | ARG90   | 0.036(#2)        | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.33 / 0.30                                     |                  |             |                  | VT (N / <1) 0.61 / 0.54                               |                  |      | CR 63                   |           |
| 13 | No Foam: CLR / ARG90 / RLE 70/36 (2MM/2MM) - 7/8" IG |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.090  | 0.688       | 0.090            |   |                  |             |                  | ARG90   | 0.036(#3)        | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.43 / 0.39                                     |                  |             |                  | VT (N / <1) 0.61 / 0.55                               |                  |      | CR 64                   |           |
|    | No Foam: CLR / ARG90 / RLE 70/36 (3MM/3MM) - 7/8" IG |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.117  | 0.625       | 0.117            |   |                  |             |                  | ARG90   | 0.036(#3)        | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.42 / 0.38                                     |                  |             |                  | VT (N / <1) 0.61 / 0.54                               |                  |      | CR 64                   |           |
| 14 | No Foam: E366 / ARG90 / CLR (2MM/2MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.087  | 0.688       | 0.087            |   |                  |             |                  | ARG90   | 0.022(#2)        | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.24 / 0.22                                     |                  |             |                  | VT (N / <1) 0.56 / 0.51                               |                  |      | CR 64                   |           |
|    | No Foam: E366 / ARG90 / CLR (3MM/3MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.117  | 0.625       | 0.118            |   |                  |             |                  | ARG90   | 0.022(#2)        | CL   | P1-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.24 / 0.22                                     |                  |             |                  | VT (N / <1) 0.56 / 0.50                               |                  |      | CR 64                   |           |
| 15 | No Foam: CLR / AIR / CLR (3MM/3MM) - 7/8" IG         |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.123  | 0.625       | 0.123            |   |                  |             |                  | AIR   |                  | CL   | ZE-S                    | N,G       |
|    | U-Factor 0.46  |             |                  | SHGC (N / <1) 0.68 / 0.61                                     |                  |             |                  | VT (N / <1) 0.71 / 0.64                               |                  |      | CR 45                   |           |
| 16 | No Foam: CS36 / AIR / CLR (2MM/2MM) - 7/8" IG        |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.090  | 0.688       | 0.086            |   |                  |             |                  | AIR   | 0.027(#2)        | CL   | ZE-S                    | N,G       |
|    | U-Factor 0.32  |             |                  | SHGC (N / <1) 0.32 / 0.29                                     |                  |             |                  | VT (N / <1) 0.58 / 0.52                               |                  |      | CR 58                   |           |
|    | No Foam: CS36 / AIR / CLR (3MM/3MM) - 7/8" IG        |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.128  | 0.625       | 0.123            |   |                  |             |                  | AIR   | 0.027(#2)        | CL   | ZE-S                    | N,G       |
|    | U-Factor 0.32  |             |                  | SHGC (N / <1) 0.31 / 0.29                                     |                  |             |                  | VT (N / <1) 0.57 / 0.51                               |                  |      | CR 58                   |           |
| 17 | No Foam: CS36 / ARG90 / CLR (2MM/2MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.090  | 0.688       | 0.086            |   |                  |             |                  | ARG90   | 0.027(#2)        | CL   | ZE-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.31 / 0.29                                     |                  |             |                  | VT (N / <1) 0.58 / 0.52                               |                  |      | CR 62                   |           |
|    | No Foam: CS36 / ARG90 / CLR (3MM/3MM) - 7/8" IG      |             |                  |   |                  |             |                  |   |                  |      |                         |           |
|    | 0.128  | 0.625       | 0.123            |   |                  |             |                  | ARG90   | 0.027(#2)        | CL   | ZE-S                    | N,G       |
|    | U-Factor 0.27  |             |                  | SHGC (N / <1) 0.31 / 0.28                                     |                  |             |                  | VT (N / <1) 0.57 / 0.51                               |                  |      | CR 62                   |           |

**NFRC 100/200/500 Summary Sheet  
PW4015**

| ID | Pane Thickness 1                                | Gap Width 1 | Pane Thickness 2 | Gap Width 2   | Pane Thickness 3 | Gap Width 3 | Pane Thickness 4 | Gap Fill  | Low-e (Surface#)      | Tint  | Spacer | Grid Type |
|----|---|-------------|------------------|---|------------------|-------------|------------------|---|-----------------------|-------|--------|-----------|
|    | U-Factor  |             |                  | Solar Heat Gain Coefficient (SHGC)<br>Grids (None / <1 / >=1) |                  |             |                  | Visible Transmittance (VT)<br>Grids (None / <1 / >=1) |                       |       |        |           |
| 18 | No Foam: E366 / ARG90 / CLR (2MM/2MM) - 7/8" IG |             |                  |   |                  |             |                  |   |                       |       |        |           |
|    | 0.087   | 0.688       | 0.087            |   |                  |             |                  | ARG90   | 0.022(#2)             | CL    | ZE-S   | N,G       |
|    | U-Factor 0.27                                   |             |                  | SHGC (N / <1) 0.24 / 0.22                                     |                  |             |                  | VT (N / <1) 0.56 / 0.51                               |                       | CR 62 |        |           |
|    | No Foam: E366 / ARG90 / CLR (3MM/3MM) - 7/8" IG |             |                  |   |                  |             |                  |   |                       |       |        |           |
|    | 0.117   | 0.625       | 0.118            |   |                  |             |                  | ARG90   | 0.022(#2)             | CL    | ZE-S   | N,G       |
|    | U-Factor 0.27                                   |             |                  | SHGC (N / <1) 0.24 / 0.22                                     |                  |             |                  | VT (N / <1) 0.56 / 0.50                               |                       | CR 62 |        |           |
| 19 | Foam: CS28 / ARG95 / CS73 (3MM/3MM) - 7/8" IG   |             |                  |   |                  |             |                  |   |                       |       |        |           |
|    | 0.125   | 0.625       | 0.123            |   |                  |             |                  | ARG95   | 0.021(#2) / 0.148(#4) | CL    | A8-S   | N,G       |
|    | U-Factor 0.21                                   |             |                  | SHGC (N / <1) 0.23 / 0.21                                     |                  |             |                  | VT (N / <1) 0.49 / 0.44                               |                       | CR 44 |        |           |
| 20 | Foam: E366 / ARG95 / CS73 (2MM/2MM) - 7/8" IG   |             |                  |   |                  |             |                  |   |                       |       |        |           |
|    | 0.087   | 0.688       | 0.087            |   |                  |             |                  | ARG95   | 0.022(#2) / 0.148(#4) | CL    | A8-S   | N,G       |
|    | U-Factor 0.22                                   |             |                  | SHGC (N / <1) 0.23 / 0.21                                     |                  |             |                  | VT (N / <1) 0.53 / 0.47                               |                       | CR 49 |        |           |
|    | Foam: E366 / ARG95 / CS73 (3MM/3MM) - 7/8" IG   |             |                  |   |                  |             |                  |   |                       |       |        |           |
|    | 0.117   | 0.625       | 0.123            |   |                  |             |                  | ARG95   | 0.022(#2) / 0.148(#4) | CL    | A8-S   | N,G       |
|    | U-Factor 0.22                                   |             |                  | SHGC (N / <1) 0.22 / 0.20                                     |                  |             |                  | VT (N / <1) 0.50 / 0.45                               |                       | CR 49 |        |           |
| 21 | Foam: CS28 / ARG95 / CS73 (3MM/3MM) - 7/8" IG   |             |                  |   |                  |             |                  |   |                       |       |        |           |
|    | 0.125   | 0.625       | 0.123            |   |                  |             |                  | ARG95   | 0.021(#2) / 0.148(#4) | CL    | P1-S   | N,G       |
|    | U-Factor 0.21                                   |             |                  | SHGC (N / <1) 0.23 / 0.21                                     |                  |             |                  | VT (N / <1) 0.49 / 0.44                               |                       | CR 44 |        |           |
| 22 | Foam: E366 / ARG90 / CS73 (2MM/2MM) - 7/8" IG   |             |                  |   |                  |             |                  |   |                       |       |        |           |
|    | 0.087   | 0.688       | 0.087            |   |                  |             |                  | ARG90   | 0.022(#2) / 0.148(#4) | CL    | P1-S   | N,G       |
|    | U-Factor 0.21                                   |             |                  | SHGC (N / <1) 0.23 / 0.21                                     |                  |             |                  | VT (N / <1) 0.53 / 0.47                               |                       | CR 52 |        |           |
|    | Foam: E366 / ARG90 / CS73 (3MM/3MM) - 7/8" IG   |             |                  |   |                  |             |                  |   |                       |       |        |           |
|    | 0.117   | 0.625       | 0.123            |   |                  |             |                  | ARG90   | 0.022(#2) / 0.148(#4) | CL    | P1-S   | N,G       |
|    | U-Factor 0.21                                   |             |                  | SHGC (N / <1) 0.22 / 0.20                                     |                  |             |                  | VT (N / <1) 0.50 / 0.45                               |                       | CR 52 |        |           |



The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.

Ratings values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) by an NFRC accredited Inspection Agency (IA) are to be used for labeling purposes. The ratings values were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy.

Intertek-ATI is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications. The values included in this report are not considered in compliance with ANSI/NFRC 100, ANSI/NFRC 200, and/or NFRC 500 unless the associated validation test requirements have been satisfied, as applicable.

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 4, 2022.

Results obtained are simulated values and were secured by using the designated test methods. 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 product simulated. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For INTERTEK-ATI:

SIMULATED BY:

REVIEWED BY:

---

Allison M. Ford  
Simulation Technician

---

Kristen L. Louder  
Senior Simulation Technician  
Simulator-In-Responsible-Charge

AMF:amf

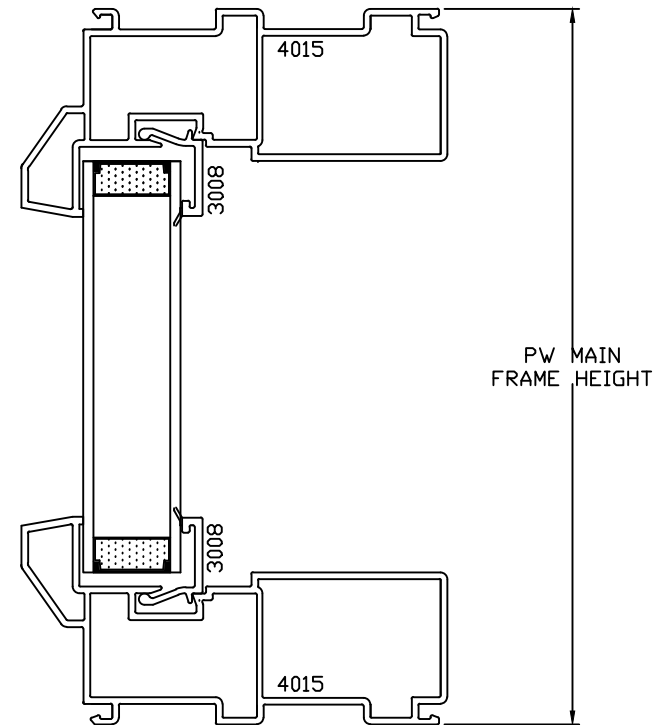
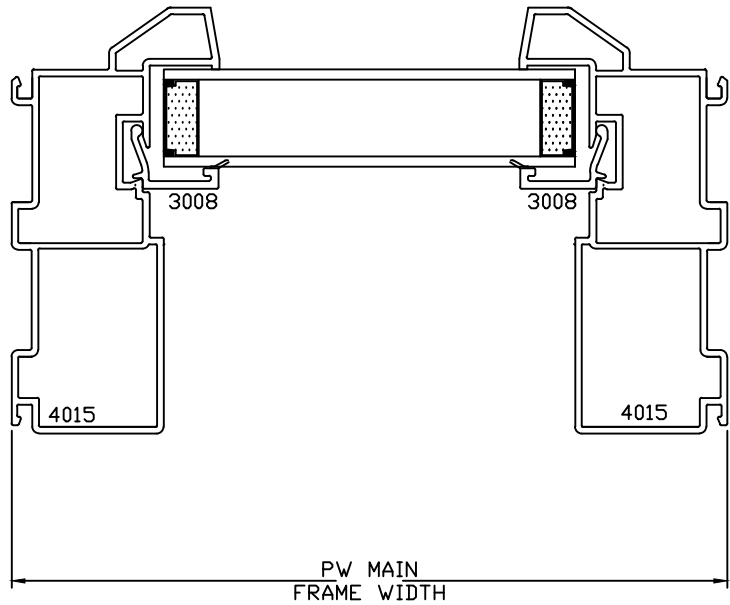
H0197.01-116-45

Attachments (pages):                      This report is complete only when all attachments listed are included.  
Appendix A: Drawings and Bills of Material (8)

**Revision Log**

| <b><u>Rev. #</u></b> | <b><u>Date</u></b> | <b><u>Page(s)</u></b> | <b><u>Revision(s)</u></b>                               |
|----------------------|--------------------|-----------------------|---|
| .01R0                | 5/4/2017           | All                   | Original Report Issued to North East Windows USA, Inc.. |

All drawings and Bills of Material used to simulate this product are enclosed in this Appendix



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"

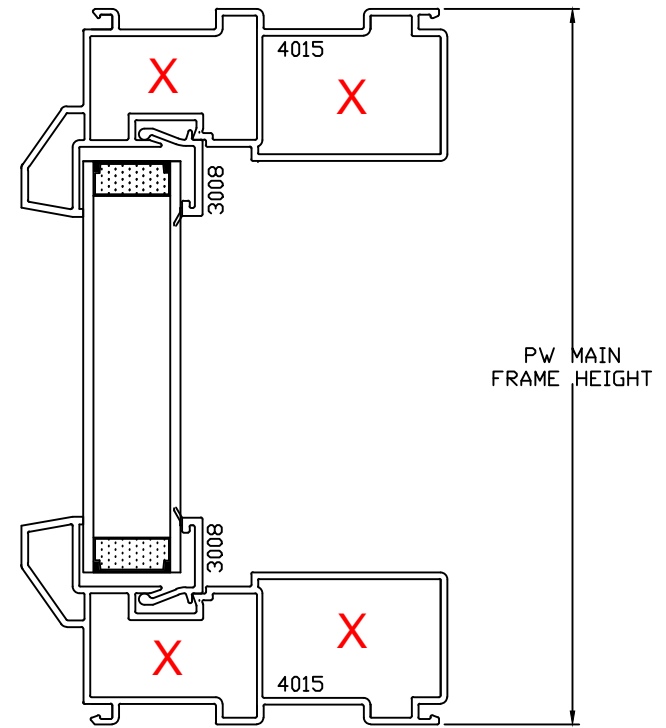
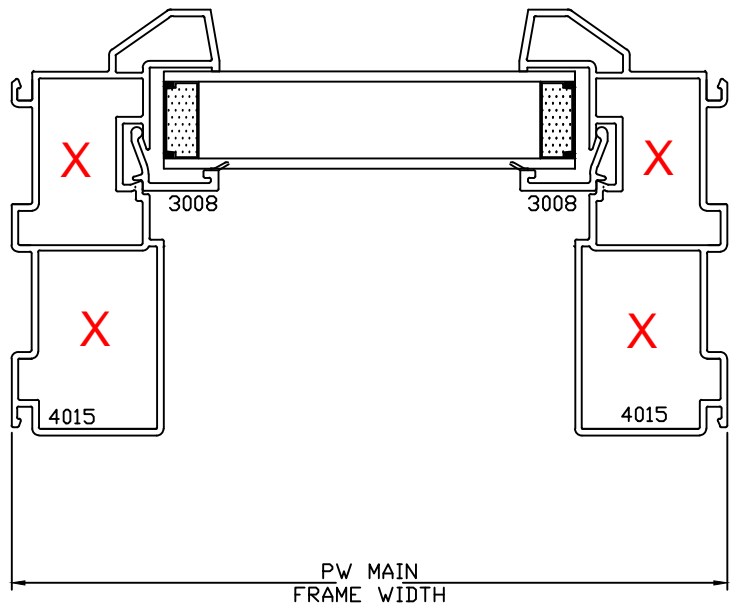
DRAWN FOR

BY DDS DESIGNS

"OUR NAME SAYS IT ALL"

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


|                                  |       |                  |         |         |
|----------------------------------|-------|------------------|---------|---------|
| TITLE PW 4015<br>WELD MAIN FRAME |       |                  |         |         |
| DWN BY<br>DDS                    | SCALE | DATE<br>01/03/12 | CHKD BY | APPD BY |
| COMPUTER NO                      |       |                  |         |         |
| DWG NO PW4015 CROSS SECTION      |       |                  |         |         |

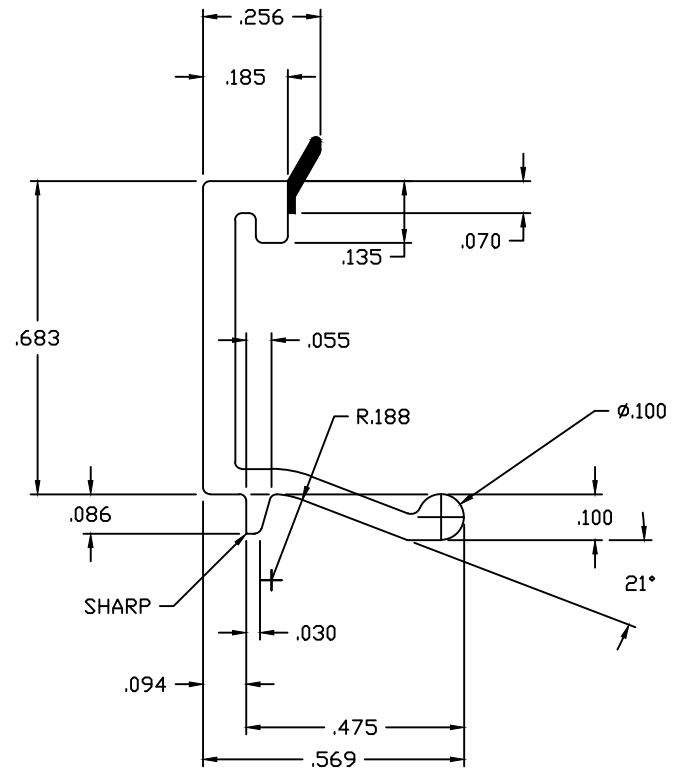


**X = Polystyrene (Expanded) Foam**

DO NOT SCALE DRAWING

|     |          |    |      |
|-----|----------|----|------|
|     |          |    |      |
|     |          |    |      |
|     |          |    |      |
|     |          |    |      |
|     |          |    |      |
| NO. | REVISION | BY | DATE |



|   |   |  |  |                  |
|---|---|--|--|------------------|
| <br>DRAWN FOR<br>BY<br>DDS<br>DESIGNS | LOCATION FOR IMPACT TEST<br>SPECIFICATION—LENGTHS TO 3/8"   | ALLOWABLE BOW MAX. 1" PER 14'<br>ANGULARITY TO BE ± 1/2" | TITLE PW 4015<br>WELD MAIN FRAME           |                  |
|   | 1) MATERIAL RIGID PVC<br>2) CAPSTOCK<br>3) UNSPECIFIED WALLS<br>4) BREAK ALL CORNERS R<br>5) AREA SQ.IN.<br>6) WT/FT LBS/FT | DWN BY<br>DDS  | SCALE                                      | DATE<br>01/03/12 |
| "OUR NAME SAYS IT ALL"  |   |  | COMPUTER NO<br>DWG NO PW4015 CROSS SECTION |                  |

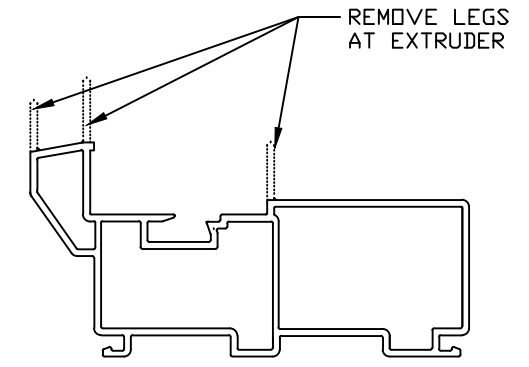
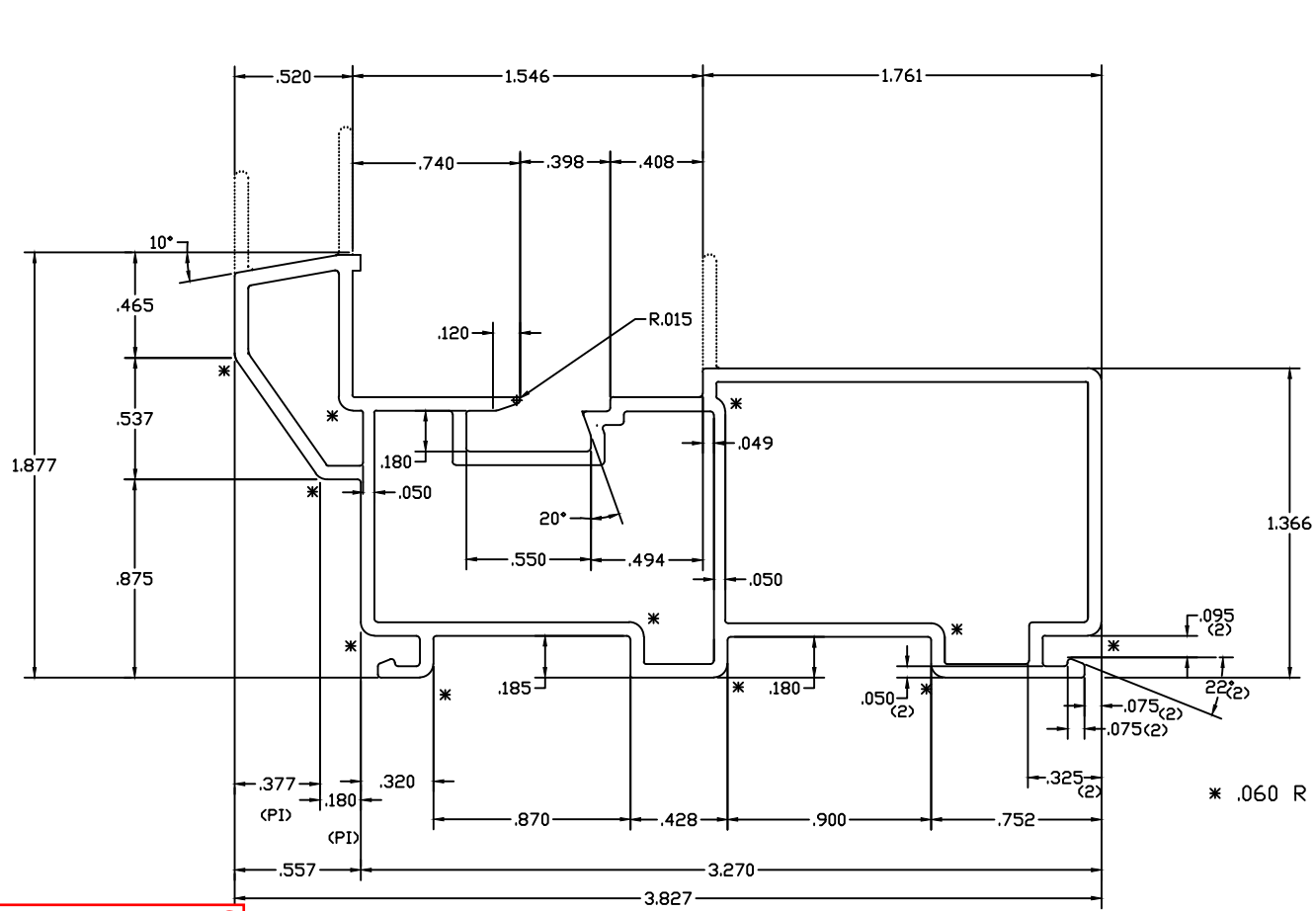


AREA OF RIGID PVC = .096  
 AREA OF SOFT PVC = .004  
 WT/FT OF RIGID PVC = .060  
 WT/FT OF SOFT PVC = .003

**Material: Rigid/Flexible PVC**

DO NOT SCALE DRAWING

|  |   |   |  |
|--|---|---|--|
| <input checked="" type="checkbox"/> LOCATION FOR IMPACT TEST<br>SPECIFICATION—LENGTHS TO 3/8"  |   | ALLOWABLE BOW MAX. 1" PER 14'<br>ANGULARITY TO BE ± 1/2 |  |
| DRAWN FOR<br><br>BY<br><br>"OUR NAME SAYS IT ALL" | 1) MATERIAL RIGID PVC<br>2) CAPSTOCK<br>3) UNSPECIFIED WALLS .070<br>4) BREAK ALL CORNERS .015 R<br>5) AREA .100 SQ.IN.<br>6) WT/FT .063 LBS/FT |   | TITLE WELDED DOUBLE HUNG<br>GLAZING BEAD |
|  | NO.   | REVISION  | BY                                       |
|  |   | DWN BY<br>DDS   | SCALE<br>4:1                             |
|  |   | DATE<br>11/20/02  | CHKD BY                                  |
|  |   | APPD BY   |  |
|  |   | COMPUTER NO   |  |
|  |   | DWG NO 3008   |  |



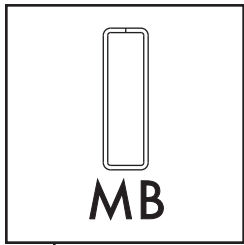
AREA BEFORE LEG REMOVAL = .912 IN SQ  
 AREA AFTER LEG REMOVAL = .823 IN SQ  
 WT/FT BEFORE LEG REMOVAL = .574 LBS/FT  
 WT/FT AFTER LEG REMOVAL = .518 LBS/FT  
 \* .060 R

**Material: Rigid PVC**

DO NOT SCALE DRAWING

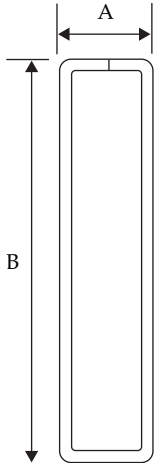
|     |          |    |      |
|-----|----------|----|------|
|     |          |    |      |
|     |          |    |      |
|     |          |    |      |
|     |          |    |      |
|     |          |    |      |
| NO. | REVISION | BY | DATE |

|  |  |   |                                      |                  |  |
|--|--|---|--------------------------------------|------------------|--|
|  | LOCATION FOR IMPACT TEST SPECIFICATION—LENGTHS TO 3/8"   | ALLOWABLE BOW MAX. 1" PER 14'<br>ANGULARITY TO BE ± 1/2 | TITLE WELDED PW<br>PW MF NO FIN NO J |                  |  |
| DRAWN FOR<br>BY DDS<br>DESIGNS<br>"OUR NAME SAYS IT ALL" | 1) MATERIAL RIGID PVC<br>2) CAPSTOCK<br>3) UNSPECIFIED WALLS .060<br>4) BREAK ALL CORNERS .015R<br>5) AREA .823 SQ.IN.<br>6) WT/FT .518 LBS/FT | DWN BY<br>DDS   | SCALE<br>2:1                         | DATE<br>08-05-11 | CHKD BY<br><br>APPD BY<br><br>COMPUTER NO<br><br>DWG NO 4015 |



### Muntin Bar

Aluminum: Painted, ~~Mill Finish, Clear & Color In™ Anodized~~



**TOLERANCE**  
 A, ± .005 (.127mm)  
 B, ± .005 (.127mm)

|  |              |                       |
|--|--------------|-----------------------|
|  | Report #:    | H0197-116-45          |
|  | Date:        | 05/04/17              |
|  | Verified by: | <i>Allison M Ford</i> |

**SPECIAL NOTICE**  
**Cleaning and Handling of Muntin Bar**

We recommend muntin bar to be wiped clean before installation into an insulating glass unit. A household grade liquid cleaner may be used for this purpose.

To avoid breakdown of painted surfaces, do not use M.E.K., Triethane, Alcohol or like substances for the cleaning of painted muntin bar.

When machining and processing muntin bar in your plant, keep saw tables and work areas free of saw cut filings to avoid scratching the painted surfaces.

| Packaging Information    |          |   |  |
|--------------------------|----------|---|--|
| Muntin Bar Size          | Part #   | Pieces Per Shipping Carton 12' 8" Lengths | Lineal Feet Per Shipping Carton 12' 8" Lengths |
| 1/8 x .610               | 219697   | 200                                       | 2533   |
| 3/16 x 9/16 <sup>†</sup> | 119320   | 150                                       | 1900   |
| 3/16 x .610 <sup>†</sup> | 119705   | 125                                       | 1583   |
| 3/16 x 5/8 <sup>†</sup>  | 120874   | 125                                       | 1583   |
| 3/16 x 3/4               | 122909   | 110                                       | 1393   |
| 3/16 x 13/16             | 123618   | 110                                       | 1393   |
| 3/16 x 1                 | 123823   | 85  | 1076   |
| 1/4 x 9/16               | 119427   | 135                                       | 1710   |
| 1/4 x 5/8 <sup>†</sup>   | 121410   | 120                                       | 1520   |
| 1/4 x 3/4                | 123063   | 95  | 1203   |
| 1/4 x 13/16              | 215017   | 95  | 1203   |
| 1/4 x 1                  | 123836   | 70  | 887  |
| 1/4 x 1 1/4              | 123856   | 51  | 646  |
| 5/16 x 1                 | 210318   | 60  | 684  |
| 3/8 x 5/8                | 121468   | 90  | 1140   |
| 3/8 x 3/4                | 123088   | 75  | 950  |
| 3/8 x 13/16              | 215016   | 70  | 887  |
| 3/8 x 7/8                | 123797   | 55  | 697  |
| 3/8 x 1                  | 201968   | 55  | 696  |
| 3/8(.375) x 3/8          | 205591   | 140                                       | 1773   |
| 7/16 x 3/8               | 119016   | 115                                       | 1457   |
| 7/16 x 3/8               | 216500** | 115                                       | 1457   |
| 7/16 x 1/2               | 213045   | 88  | 1115   |
| 7/16 x 5/8 <sup>Δ</sup>  | 214621   | 65  | 823  |
| 1/2 x 3/4 <sup>*</sup>   | 201043   | 50  | 633  |
| 1/2 x 1                  | 203710   | 40  | 506  |

| Specification In Inches   |      |       |
|---------------------------|------|-------|
| Muntin Bar Size           | A    | B     |
| 1/8 x .610                | .125 | .610  |
| 3/16 x 9/16 <sup>†</sup>  | .187 | .551  |
| 3/16 x .610 <sup>†</sup>  | .187 | .610  |
| 3/16 x 5/8 <sup>†</sup>   | .187 | .630  |
| 3/16 x 3/4 <sup>†</sup>   | .187 | .775  |
| 3/16 x 13/16 <sup>†</sup> | .187 | .801  |
| 3/16 x 1                  | .187 | 1.000 |
| 1/4 x 9/16                | .235 | .562  |
| 1/4 x 5/8 <sup>†</sup>    | .235 | .625  |
| 1/4 x 3/4                 | .235 | .765  |
| 1/4 x 13/16               | .235 | .801  |
| 1/4 x 1                   | .235 | 1.000 |
| 1/4 x 1 1/4               | .235 | 1.250 |
| 5/16 x 1                  | .312 | 1.000 |
| 3/8 x 5/8 <sup>†</sup>    | .325 | .625  |
| 3/8 x 3/4                 | .325 | .750  |
| 3/8 x 13/16               | .325 | .801  |
| 3/8 x 7/8                 | .325 | .875  |
| 3/8 x 1                   | .325 | 1.000 |
| 3/8(.375) x 3/8           | .375 | .375  |
| 7/16 x 3/8                | .438 | .375  |
| 7/16 x 3/8                | .438 | .375  |
| 7/16 x 1/2                | .438 | .500  |
| 7/16 x 5/8 <sup>Δ</sup>   | .438 | .625  |
| 1/2 x 3/4 <sup>*</sup>    | .500 | .750  |
| 1/2 x 1                   | .500 | 1.000 |

Part numbers shown are standard white color.

Material thickness: .0185

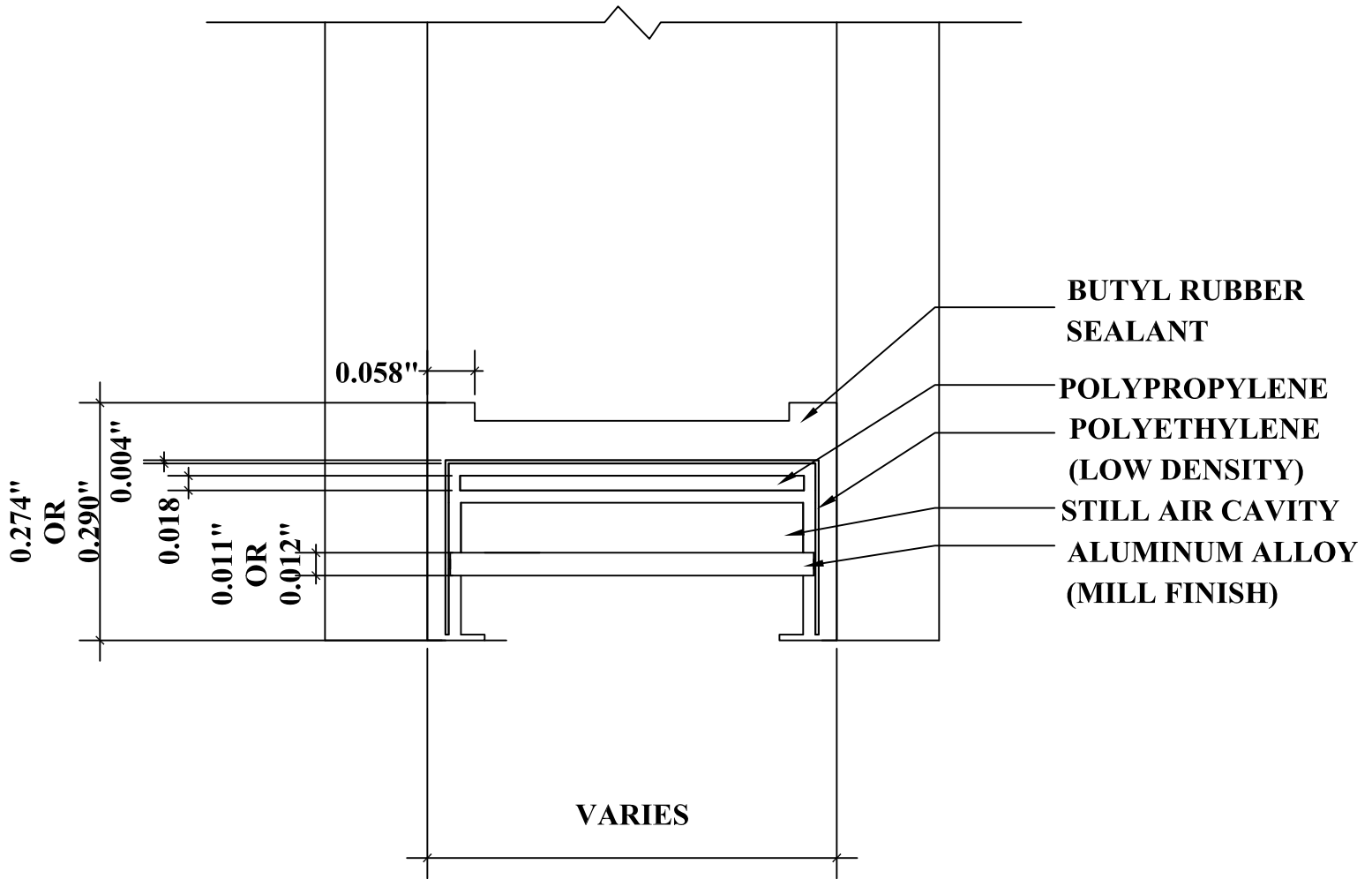
<sup>†</sup> Available in tutone. Please see Color Selection Chart located in front of catalog.

<sup>Δ</sup> Part number shown is Dark Bronze Anodized Color.

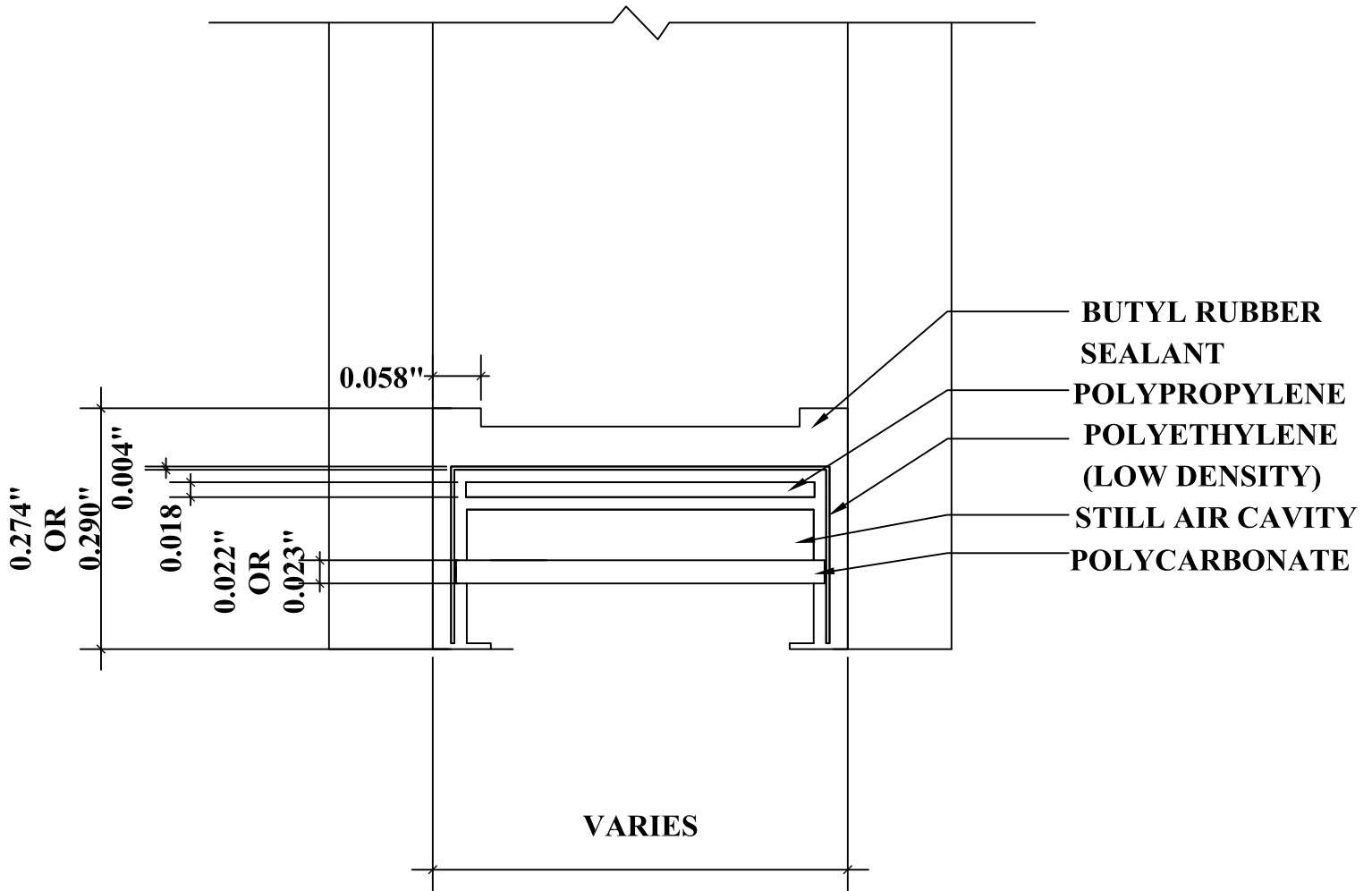
<sup>\*</sup> Part number shown is Clear Anodized. <sup>\*\*</sup>Part number shown is white welded.

Note: Available in pre-cut lengths and pre-notched; tutone and post-painted. Custom colors also available.

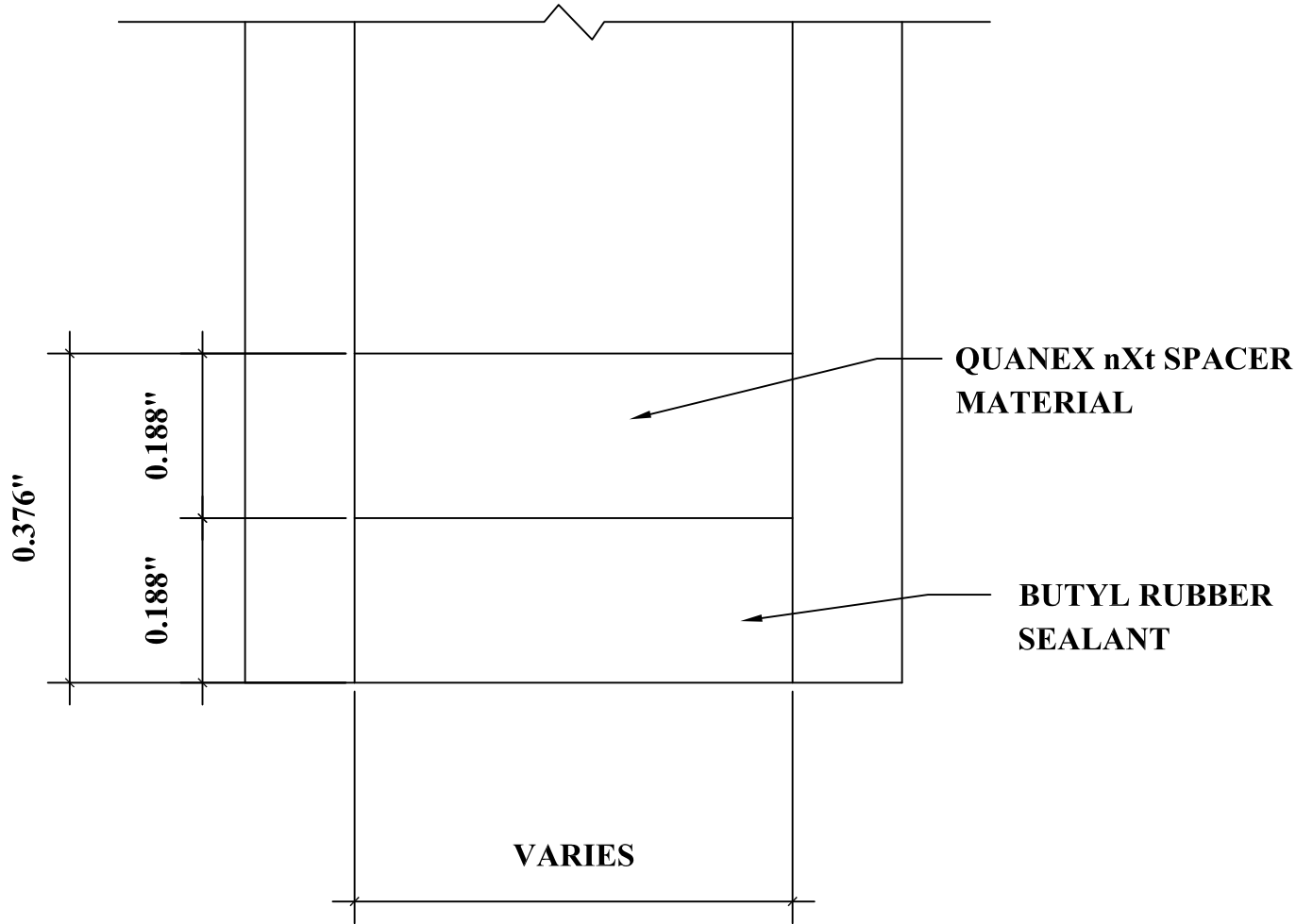




DETAIL FOR THERMAL MODELING OF  
QUANEX DURASEAL SPACER (A8-S)



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



DETAIL FOR THERMAL MODELING OF  
QUANEX SUPER SPACER nXt (ZE-S)