

### Awning Window Thermal Performance

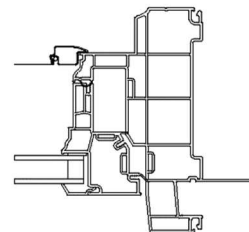
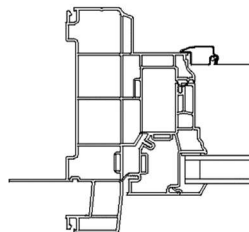
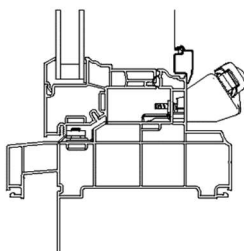
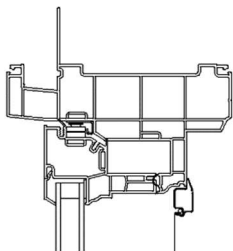
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |    |   |
|---|----------|------|------|----|-------------------|-----------------|----|----|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.24     | 0.22 | 0.42 | 59 | Yes               | -               | NC | SC | S |
| Dual Pane Low-E (Cardinal 270)  | 0.27     | 0.23 | 0.42 | 55 | Yes               | -               | -  | SC | S |
| Dual Pane Clear   | 0.38     | 0.47 | 0.49 | 44 | -                 | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.25     | 0.22 | 0.42 | 59 | Yes               | -               | NC | SC | S |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.27     | 0.23 | 0.42 | 55 | Yes               | -               | -  | SC | S |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.25     | 0.24 | 0.43 | 57 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.28     | 0.25 | 0.43 | 54 | Yes               | -               | -  | -  | - |
| Dual Pane Clear Tempered  | 0.38     | 0.47 | 0.49 | 43 | -                 | -               | -  | -  | - |
| Dual Pane E7 (Cardinal 180)   | 0.24     | 0.37 | 0.46 | 60 | Yes               | N               | NC | -  | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.25     | 0.37 | 0.46 | 62 | Yes               | -               | NC | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.21     | 0.21 | 0.38 | 69 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.18     | 0.19 | 0.32 | 73 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.22     | 0.21 | 0.38 | 67 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.19     | 0.19 | 0.32 | 72 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.22     | 0.38 | 0.42 | 66 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.20     | 0.37 | 0.39 | 70 | Yes               | N               | NC | -  | - |
| Triple Pane E7 (Cardinal 270)   | 0.21     | 0.21 | 0.38 | 69 | Yes               | N               | NC | SC | S |
| Triple Pane E7 Tempered (Cardinal 270)                                | 0.22     | 0.21 | 0.38 | 67 | Yes               | N               | NC | SC | S |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.22     | 0.38 | 0.42 | 66 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.23     | 0.36 | 0.43 | 64 | Yes               | N               | NC | -  | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

### Awning Window Structural Performance (Dual and Triple Pane Glazing)

| Air, Water, and Structural Ratings | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Awning - Vent                      | 48 x 32                 | Single        | PG80              | LC                |
| Awning - Vent                      | 48 x 32                 | Single        | PG45              | CW                |
| Awning - Vent                      | 60 x 48                 | Single        | PG40              | LC                |



Casement/Awning Picture Window Thermal Performance

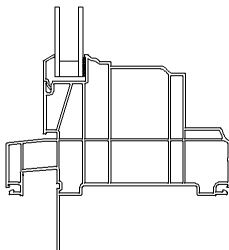
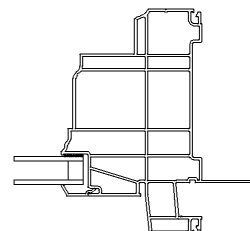
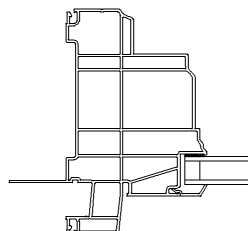
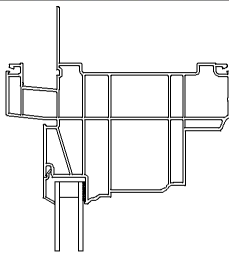
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |    |   |
|---|----------|------|------|----|-------------------|-----------------|----|----|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.25     | 0.27 | 0.51 | 60 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E (Cardinal 270)  | 0.28     | 0.28 | 0.51 | 57 | Yes               | -               | -  | -  | - |
| Dual Pane Clear   | 0.41     | 0.58 | 0.60 | 44 | -                 | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.25     | 0.27 | 0.51 | 60 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.28     | 0.28 | 0.51 | 56 | Yes               | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.25     | 0.30 | 0.54 | 58 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.28     | 0.30 | 0.54 | 55 | Yes               | -               | -  | -  | - |
| Dual Pane Clear Tempered  | 0.41     | 0.58 | 0.60 | 44 | -                 | -               | -  | -  | - |
| Dual Pane E7 (Cardinal 180)   | 0.25     | 0.46 | 0.56 | 61 | Yes               | N               | -  | -  | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.25     | 0.46 | 0.56 | 61 | Yes               | N               | -  | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.20     | 0.25 | 0.47 | 70 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.18     | 0.23 | 0.40 | 75 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.21     | 0.25 | 0.47 | 66 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.17     | 0.23 | 0.40 | 72 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.23     | 0.47 | 0.52 | 66 | Yes               | N               | -  | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.20     | 0.46 | 0.49 | 69 | Yes               | N               | -  | -  | - |
| Triple Pane E7 (Cardinal 270)   | 0.20     | 0.25 | 0.47 | 70 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Cardinal 270)                                | 0.21     | 0.25 | 0.47 | 66 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.23     | 0.47 | 0.52 | 66 | Yes               | N               | -  | -  | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.22     | 0.39 | 0.47 | 65 | Yes               | N               | NC | -  | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

Casement/Awning Picture Window Structural Performance

| Air, Water, and Structural Ratings    | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|---------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Casement/Awning Picture (Dual Pane)   | 60 x 60                 | Single        | PG65              | CW                |
| Casement/Awning Picture (Dual Pane)   | 72 x 72                 | Single        | PG50              | LC                |
| Casement/Awning Picture (Dual Pane)   | 72 x 84                 | Single        | PG50              | LC                |
| Casement/Awning Picture (Dual Pane)   | 36 x 82                 | Single        | PG75              | LC                |
| Casement/Awning Picture (Triple Pane) | 60 x 60                 | Single        | PG70              | LC                |
| Casement/Awning Picture (Triple Pane) | 72 x 72                 | Single        | PG60              | LC                |
| Casement/Awning Picture (Triple Pane) | 36 x 82                 | Single        | PG80              | LC                |





### Casement Window Thermal Performance

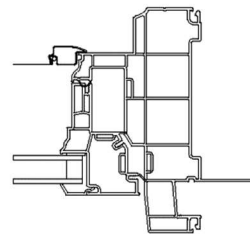
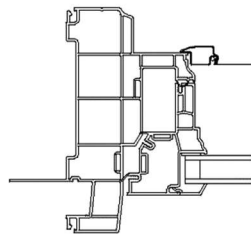
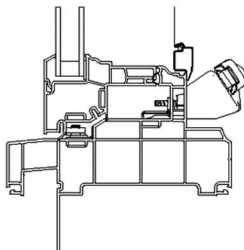
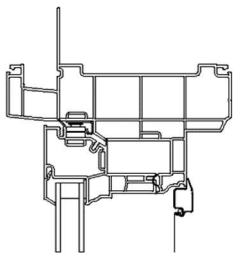
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |    |   |
|---|----------|------|------|----|-------------------|-----------------|----|----|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.24     | 0.22 | 0.42 | 61 | Yes               | -               | NC | SC | S |
| Dual Pane Low-E (Cardinal 270)  | 0.27     | 0.23 | 0.42 | 57 | Yes               | -               | -  | SC | S |
| Dual Pane Clear   | 0.37     | 0.47 | 0.49 | 44 | -                 | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.25     | 0.22 | 0.42 | 60 | Yes               | -               | NC | SC | S |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.27     | 0.23 | 0.42 | 56 | Yes               | -               | -  | SC | S |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.25     | 0.24 | 0.43 | 59 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.28     | 0.25 | 0.43 | 55 | Yes               | -               | -  | -  | - |
| Dual Pane Clear Tempered  | 0.38     | 0.47 | 0.49 | 44 | -                 | -               | -  | -  | - |
| Dual Pane E7 (Cardinal 180)   | 0.24     | 0.37 | 0.46 | 61 | Yes               | N               | NC | -  | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.25     | 0.37 | 0.45 | 62 |                   | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.21     | 0.21 | 0.38 | 67 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.18     | 0.19 | 0.32 | 72 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.21     | 0.21 | 0.38 | 65 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.18     | 0.19 | 0.32 | 71 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.22     | 0.38 | 0.42 | 65 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.20     | 0.37 | 0.39 | 68 | Yes               | N               | NC | -  | - |
| Triple Pane E7 (Cardinal 270)   | 0.21     | 0.21 | 0.38 | 67 | Yes               | N               | NC | SC | S |
| Triple Pane E7 Tempered (Cardinal 270)                                | 0.21     | 0.21 | 0.38 | 65 | Yes               | N               | NC | SC | S |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.22     | 0.38 | 0.42 | 65 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.23     | 0.36 | 0.43 | 62 | Yes               | N               | NC | -  | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

### Casement Window Structural Performance (Dual and Triple Pane Glazing)

| Air, Water, and Structural Ratings | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Casement - Vent                    | 36 x 72                 | Single        | PG65              | CW                |



**Direct Glaze Polygon & Radius Windows Thermal Performance**

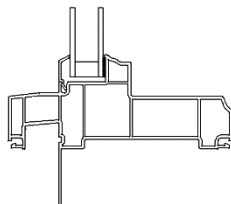
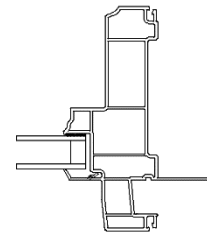
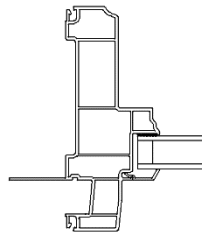
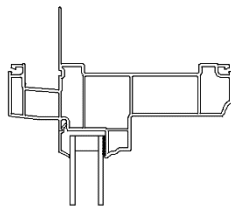
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |   |   |
|---|----------|------|------|----|-------------------|-----------------|----|---|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.27     | 0.30 | 0.57 | 64 | Yes               | -               | -  | - | - |
| Dual Pane Low-E (Cardinal 270)  | 0.31     | 0.30 | 0.57 | 60 | -                 | -               | -  | - | - |
| Dual Pane Clear   | 0.44     | 0.65 | 0.67 | 46 | -                 | -               | -  | - | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.27     | 0.30 | 0.57 | 61 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.30     | 0.30 | 0.57 | 57 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.27     | 0.33 | 0.59 | 60 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.30     | 0.33 | 0.59 | 57 | Yes               | -               | -  | - | - |
| Dual Pane Clear Tempered  | 0.44     | 0.65 | 0.67 | 45 | -                 | -               | -  | - | - |
| Dual Pane E7 (Cardinal 180)   | 0.26     | 0.51 | 0.62 | 63 | Yes               | N               | -  | - | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.25     | 0.51 | 0.62 | 63 | Yes               | N               | -  | - | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.22     | 0.28 | 0.52 | 68 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.19     | 0.26 | 0.45 | 71 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.24     | 0.28 | 0.52 | 65 | Yes               | -               | NC | - | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.19     | 0.26 | 0.45 | 71 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.25     | 0.52 | 0.58 | 65 | Yes               | N               | -  | - | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.22     | 0.50 | 0.54 | 69 | Yes               | N               | -  | - | - |
| Triple Pane E7 (Cardinal 270)   | 0.22     | 0.28 | 0.52 | 68 | Yes               | N               | NC | - | - |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.25     | 0.52 | 0.58 | 65 | Yes               | N               | -  | - | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.24     | 0.49 | 0.59 | 67 | Yes               | N               | -  | - | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

**Direct Glaze Polygon & Radius Windows Structural Performance (Dual and Triple Pane Glazing)**

| Air, Water, and Structural Ratings | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Direct Glaze Polygon & Radius      | 60 x 60                 | Single        | PG70              | LC                |
| Direct Glaze Polygon & Radius      | 72 x 72                 | Single        | PG45              | LC                |
| Direct Glaze Polygon & Radius      | 72 x 84                 | Single        | PG40              | LC                |



Direct Glaze Polygon & Radius Windows Thermal Performance

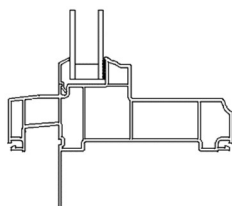
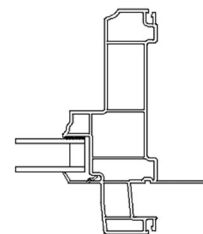
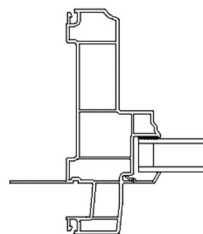
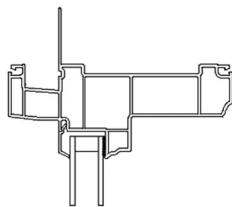
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |   |   |
|---|----------|------|------|----|-------------------|-----------------|----|---|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.27     | 0.30 | 0.57 | 64 | Yes               | -               | -  | - | - |
| Dual Pane Low-E (Cardinal 270)  | 0.31     | 0.30 | 0.57 | 60 | -                 | -               | -  | - | - |
| Dual Pane Clear   | 0.44     | 0.65 | 0.67 | 46 | -                 | -               | -  | - | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.27     | 0.30 | 0.57 | 61 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.30     | 0.30 | 0.57 | 57 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.27     | 0.33 | 0.59 | 60 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.30     | 0.33 | 0.59 | 57 | Yes               | -               | -  | - | - |
| Dual Pane Clear Tempered  | 0.44     | 0.65 | 0.67 | 45 | -                 | -               | -  | - | - |
| Dual Pane E7 (Cardinal 180)   | 0.26     | 0.51 | 0.62 | 63 | Yes               | N               | -  | - | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.25     | 0.51 | 0.62 | 63 | Yes               | N               | -  | - | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.22     | 0.28 | 0.52 | 68 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.19     | 0.26 | 0.45 | 71 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.24     | 0.28 | 0.52 | 65 | Yes               | -               | NC | - | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.19     | 0.26 | 0.45 | 71 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.25     | 0.52 | 0.58 | 65 | Yes               | N               | -  | - | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.22     | 0.50 | 0.54 | 69 | Yes               | N               | -  | - | - |
| Triple Pane E7 (Cardinal 270)   | 0.22     | 0.28 | 0.52 | 68 | Yes               | N               | NC | - | - |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.25     | 0.52 | 0.58 | 65 | Yes               | N               | -  | - | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.24     | 0.49 | 0.59 | 67 | Yes               | N               | -  | - | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

Direct Glaze Polygon & Radius Windows Structural Performance (Dual and Triple Pane Glazing)

| Air, Water, and Structural Ratings | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Direct Glaze Polygon & Radius      | 60 x 60                 | Single        | PG70              | LC                |
| Direct Glaze Polygon & Radius      | 72 x 72                 | Single        | PG45              | LC                |
| Direct Glaze Polygon & Radius      | 72 x 84                 | Single        | PG40              | LC                |





### Double Hung Direct Set

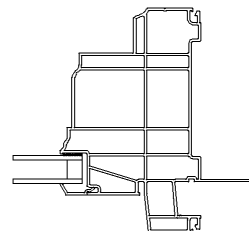
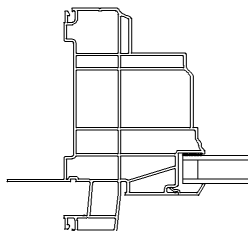
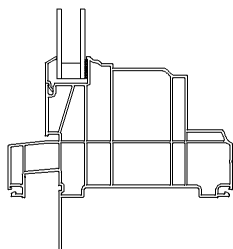
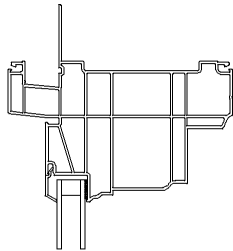
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |    |   |
|---|----------|------|------|----|-------------------|-----------------|----|----|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.25     | 0.27 | 0.51 | 60 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E (Cardinal 270)  | 0.28     | 0.28 | 0.51 | 57 | Yes               | -               | -  | -  | - |
| Dual Pane Clear   | 0.41     | 0.58 | 0.60 | 44 | -                 | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.25     | 0.27 | 0.51 | 60 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.28     | 0.28 | 0.51 | 56 | Yes               | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.25     | 0.30 | 0.54 | 58 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.28     | 0.30 | 0.54 | 55 | Yes               | -               | -  | -  | - |
| Dual Pane Clear Tempered  | 0.41     | 0.58 | 0.60 | 44 | -                 | -               | -  | -  | - |
| Dual Pane E7 (Cardinal 180)   | 0.25     | 0.46 | 0.56 | 61 | Yes               | N               | -  | -  | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.25     | 0.46 | 0.56 | 61 | Yes               | N               | -  | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.20     | 0.25 | 0.47 | 70 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.18     | 0.23 | 0.40 | 75 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.21     | 0.25 | 0.47 | 66 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.17     | 0.23 | 0.40 | 72 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.23     | 0.47 | 0.52 | 66 | Yes               | N               | -  | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.20     | 0.46 | 0.49 | 69 | Yes               | N               | -  | -  | - |
| Triple Pane E7 (Cardinal 270)   | 0.20     | 0.25 | 0.47 | 70 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Cardinal 270)                                | 0.21     | 0.25 | 0.47 | 66 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.23     | 0.47 | 0.52 | 66 | Yes               | N               | -  | -  | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.22     | 0.39 | 0.47 | 65 | Yes               | N               | NC | -  | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

### Double Hung Direct Set Window Structural Performance

| Air, Water, and Structural Ratings   | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|--------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Double Hung Direct Set (Dual Pane)   | 60 x 60                 | Single        | PG65              | CW                |
| Double Hung Direct Set (Dual Pane)   | 72 x 72                 | Single        | PG50              | LC                |
| Double Hung Direct Set (Dual Pane)   | 72 x 84                 | Single        | PG50              | LC                |
| Double Hung Direct Set (Dual Pane)   | 36 x 82                 | Single        | PG75              | LC                |
| Double Hung Direct Set (Triple Pane) | 60 x 60                 | Single        | PG70              | LC                |
| Double Hung Direct Set (Triple Pane) | 72 x 72                 | Single        | PG60              | LC                |
| Double Hung Direct Set (Triple Pane) | 36 x 82                 | Single        | PG80              | LC                |



**Double Hung Window Thermal Performance**

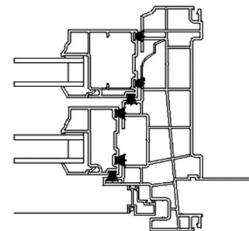
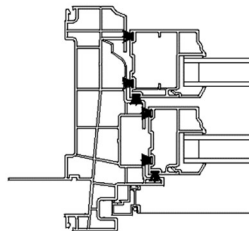
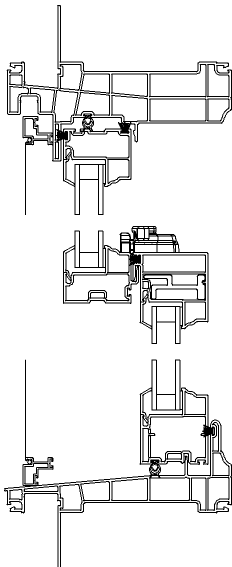
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |    |   |
|---|----------|------|------|----|-------------------|-----------------|----|----|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.27     | 0.27 | 0.50 | 58 | Yes               | -               | -  | -  | - |
| Dual Pane Low-E (Cardinal 270)  | 0.30     | 0.27 | 0.50 | 54 | Yes               | -               | -  | -  | - |
| Dual Pane Clear   | 0.43     | 0.57 | 0.59 | 48 | -                 | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.27     | 0.27 | 0.50 | 56 | Yes               | -               | -  | -  | - |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.31     | 0.27 | 0.50 | 53 | -                 | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.28     | 0.29 | 0.52 | 55 | Yes               | -               | -  | -  | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.31     | 0.29 | 0.52 | 52 | -                 | -               | -  | -  | - |
| Dual Pane Clear Tempered  | 0.43     | 0.57 | 0.59 | 43 | -                 | -               | -  | -  | - |
| Dual Pane E7 (Cardinal 180)   | 0.26     | 0.44 | 0.55 | 59 | Yes               | N               | -  | -  | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.26     | 0.44 | 0.55 | 59 | Yes               | N               | -  | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.23     | 0.25 | 0.46 | 67 | Yes               | -               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.20     | 0.23 | 0.39 | 71 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.24     | 0.25 | 0.46 | 64 | Yes               | -               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.20     | 0.23 | 0.39 | 68 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.25     | 0.46 | 0.51 | 65 | Yes               | N               | -  | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.22     | 0.44 | 0.47 | 68 | Yes               | N               | -  | -  | - |
| Triple Pane E7 (Cardinal 270)   | 0.22     | 0.25 | 0.46 | 67 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.25     | 0.46 | 0.51 | 65 | Yes               | N               | -  | -  | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.24     | 0.43 | 0.52 | 64 | Yes               | N               | -  | -  | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

**Double Hung Window Structural Performance (Dual and Triple Pane Glazing)**

| Air, Water, and Structural Ratings | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Hidden Tilt Latches                | 48 x 84                 | Single        | PG50              | LC                |
| Standard Tilt Latches              | 48 x 84                 | Single        | PG50              | LC                |
| Hidden Tilt Latches                | 44 x 94                 | Single        | PG40              | LC                |
| Standard Tilt Latches              | 44 x 94                 | Single        | PG45              | LC                |





### Double Hung Sash Glaze Picture Window Thermal Performance

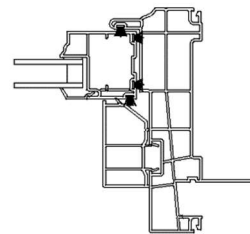
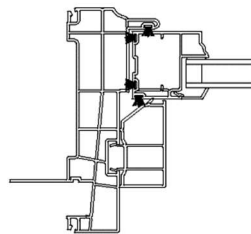
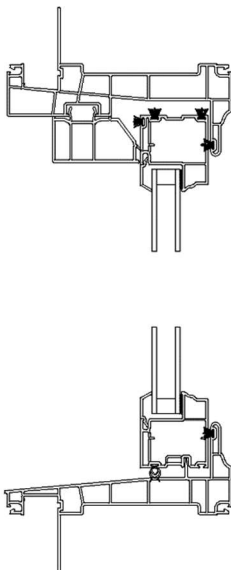
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |   |   |
|---|----------|------|------|----|-------------------|-----------------|----|---|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.26     | 0.28 | 0.52 | 61 | Yes               | -               | -  | - | - |
| Dual Pane Low-E (Cardinal 270)  | 0.29     | 0.28 | 0.52 | 58 | Yes               | -               | -  | - | - |
| Dual Pane Clear   | 0.43     | 0.59 | 0.61 | 45 | -                 | -               | -  | - | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.26     | 0.28 | 0.52 | 61 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.29     | 0.28 | 0.52 | 57 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.26     | 0.30 | 0.54 | 60 | Yes               | -               | -  | - | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.29     | 0.30 | 0.54 | 56 | Yes               | -               | -  | - | - |
| Dual Pane Clear Tempered  | 0.43     | 0.59 | 0.61 | 45 | -                 | -               | -  | - | - |
| Dual Pane E7 (Cardinal 180)   | 0.26     | 0.46 | 0.57 | 62 | Yes               | N               | -  | - | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.26     | 0.46 | 0.57 | 62 | Yes               | N               | -  | - | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.21     | 0.26 | 0.48 | 70 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.19     | 0.24 | 0.41 | 75 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.22     | 0.26 | 0.48 | 68 | Yes               | -               | NC | - | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.18     | 0.24 | 0.41 | 73 | Yes               | N               | NC | - | - |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.24     | 0.48 | 0.53 | 68 | Yes               | N               | -  | - | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.21     | 0.46 | 0.49 | 71 | Yes               | N               | -  | - | - |
| Triple Pane E7 (Cardinal 270)   | 0.21     | 0.26 | 0.48 | 70 | Yes               | N               | NC | - | - |
| Triple Pane E7 Tempered (Cardinal 270)                                | 0.22     | 0.26 | 0.48 | 68 | Yes               | -               | NC | - | - |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.24     | 0.48 | 0.53 | 68 | Yes               | N               | -  | - | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.24     | 0.45 | 0.54 | 65 | Yes               | N               | -  | - | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

### Double Hung Sash Glaze Picture Window Structural Performance (Dual and Triple Pane Glazing)

| Air, Water, and Structural Ratings | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Double Hung Sash Glaze Picture     | 60 x 60                 | Single        | PG60              | CW                |
| Double Hung Sash Glaze Picture     | 72 x 72                 | Single        | PG50              | LC                |
| Double Hung Sash Glaze Picture     | 72 x 84                 | Single        | PG35              | LC                |





### Double Hung Transom Window Thermal Performance

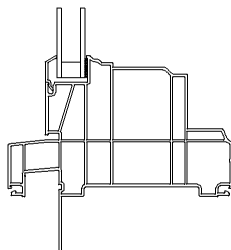
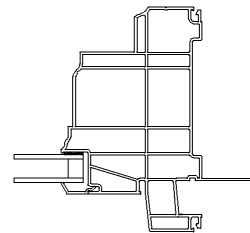
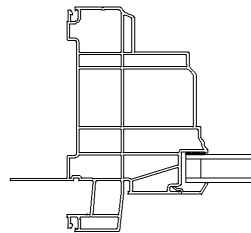
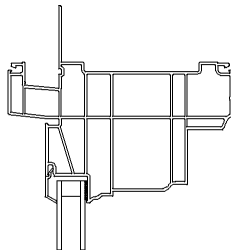
| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |    |   |
|---|----------|------|------|----|-------------------|-----------------|----|----|---|
| Dual Pane Low-E Argon (Cardinal 270)                                  | 0.25     | 0.27 | 0.51 | 60 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E (Cardinal 270)  | 0.28     | 0.28 | 0.51 | 57 | Yes               | -               | -  | -  | - |
| Dual Pane Clear   | 0.41     | 0.58 | 0.60 | 44 | -                 | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (Cardinal 270)                         | 0.25     | 0.27 | 0.51 | 60 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E Tempered (Cardinal 270)                               | 0.28     | 0.28 | 0.51 | 56 | Yes               | -               | -  | -  | - |
| Dual Pane Low-E Argon Tempered (SB60)                                 | 0.25     | 0.30 | 0.54 | 58 | Yes               | -               | NC | -  | - |
| Dual Pane Low-E Tempered (SB60)                                       | 0.28     | 0.30 | 0.54 | 55 | Yes               | -               | -  | -  | - |
| Dual Pane Clear Tempered  | 0.41     | 0.58 | 0.60 | 44 | -                 | -               | -  | -  | - |
| Dual Pane E7 (Cardinal 180)   | 0.25     | 0.46 | 0.56 | 61 | Yes               | N               | -  | -  | - |
| Dual Pane E7 Tempered (Cardinal 180)                                  | 0.25     | 0.46 | 0.56 | 61 | Yes               | N               | -  | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270)              | 0.20     | 0.25 | 0.47 | 70 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270)              | 0.18     | 0.23 | 0.40 | 75 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Cardinal 270)     | 0.21     | 0.25 | 0.47 | 66 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Cardinal 270)     | 0.17     | 0.23 | 0.40 | 72 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Clear Tempered & Argon (Energy Advantage) | 0.23     | 0.47 | 0.52 | 66 | Yes               | N               | -  | -  | - |
| Triple Pane Low-E / Clear / Low-E Tempered & Argon (Energy Advantage) | 0.20     | 0.46 | 0.49 | 69 | Yes               | N               | -  | -  | - |
| Triple Pane E7 (Cardinal 270)   | 0.20     | 0.25 | 0.47 | 70 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Cardinal 270)                                | 0.21     | 0.25 | 0.47 | 66 | Yes               | N               | NC | -  | - |
| Triple Pane E7 Tempered (Energy Advantage)                            | 0.23     | 0.47 | 0.52 | 66 | Yes               | N               | -  | -  | - |
| Triple Pane E7 Tempered (Cardinal 180)                                | 0.22     | 0.39 | 0.47 | 65 | Yes               | N               | NC | -  | - |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

### Double Hung Transom Structural Performance (Dual and Triple Pane Glazing)

| Air, Water, and Structural Ratings | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Double Hung Transom (Dual Pane)    | 60 x 44                 | Single        | PG65              | CW                |
| Double Hung Transom (Dual Pane)    | 72 x 44                 | Single        | PG50              | LC                |
| Double Hung Transom (Dual Pane)    | 36 x 44                 | Single        | PG75              | LC                |
| Double Hung Transom (Triple Pane)  | 60 x 44                 | Single        | PG70              | LC                |
| Double Hung Transom (Triple Pane)  | 72 x 44                 | Single        | PG60              | LC                |
| Double Hung Transom (Triple Pane)  | 36 x 44                 | Single        | PG80              | LC                |



| Product Type                   | Frame Size (In.) | Air Infiltration (cfm/ft <sup>2</sup> ) | Water Resistance (psf) | Uniform Load Test Pressure (psf) | Design Pressure (psf) | Performance Grade |
|--------------------------------|------------------|---|------------------------|----------------------------------|-----------------------|-------------------|
| Double Hung                    |                  |   |                        |                                  |                       |                   |
| Hidden Tilt Latches            | 36 x 72          | 0.01                                    | 7.52                   | 75.19                            | 50.13                 | R PG50            |
| Standard Tilt Latches          | 36 x 72          | 0.01                                    | 7.52                   | 75.19                            | 50.13                 | R PG50            |
| Hidden Tilt Latches            | 48 x 84          | 0.01                                    | 7.52                   | 75.19                            | 50.13                 | LC PG50           |
| Standard Tilt Latches          | 48 x 84          | 0.01                                    | 7.52                   | 75.19                            | 50.13                 | LC PG50           |
| Hidden Tilt Latches            | 44 x 94          | 0.09                                    | 7.52                   | 60.15                            | 40.10                 | LC PG40           |
| Standard Tilt Latches          | 44 x 94          | 0.12                                    | 7.52                   | 67.67                            | 45.11                 | LC PG45           |
| Double Hung Picture            | 60 x 60          | <0.01                                   | 12.11                  | 90.23                            | 60.15                 | CW PG60           |
| Double Hung Picture            | 72 x 72          | <0.01                                   | 7.52                   | 75.19                            | 50.13                 | LC PG50           |
| Double Hung Picture            | 72 x 84          | <0.01                                   | 7.52                   | 52.63                            | 35.08                 | LC PG35           |
| Casement - Vent                | 36 x 72          | <0.01                                   | 9.19                   | 97.74                            | 65.16                 | CW PG65           |
| Awning - Vent                  | 48 x 32          | <0.01                                   | 12.11                  | 120.30                           | 80.20                 | LC PG80           |
| Awning - Vent                  | 48 x 32          | <0.01                                   | 12.11                  | 67.67                            | 45.11                 | CW PG45           |
| Awning - Vent                  | 60 x 48          | 0.10                                    | 12.11                  | 60.15                            | 40.10                 | LC PG40           |
| Casement Picture (Dual Pane)   | 60 x 60          | <0.01                                   | 10.65                  | 97.97                            | 65.15                 | CW PG65           |
| Casement Picture (Dual Pane)   | 72 x 72          | 0.10                                    | 7.52                   | 75.19                            | 50.13                 | LC PG50           |
| Casement Picture (Dual Pane)   | 72 x 84          | 0.10                                    | 7.52                   | 75.19                            | 50.13                 | LC PG50           |
| Casement Picture (Dual Pane)   | 36 x 82          | <0.01                                   | 12.11                  | 112.78                           | 75.19                 | LC PG75           |
| Casement Picture (Triple Pane) | 60 x 60          | <0.01                                   | 12.11                  | 105.26                           | 70.18                 | LC PG70           |
| Casement Picture (Triple Pane) | 72 x 72          | <0.01                                   | 12.11                  | 90.23                            | 60.15                 | LC PG60           |
| Casement Picture (Triple Pane) | 36 x 82          | <0.01                                   | 12.11                  | 120.30                           | 80.20                 | LC PG80           |
| Direct Glaze Picture           | 60 x 60          | <0.01                                   | 12.11                  | 105.26                           | 70.18                 | LC PG70           |
| Direct Glaze Picture           | 72 x 72          | <0.01                                   | 12.11                  | 67.67                            | 45.11                 | CW PG45           |
| Direct Glaze Picture           | 72 x 84          | <0.01                                   | 12.11                  | 60.15                            | 40.10                 | LC PG40           |
| Sliding Patio Door             |                  |   |                        |                                  |                       |                   |
| Two Panel                      | 71.5 x 82        | 0.20                                    | 7.52                   | 75.19                            | 50.13                 | LC PG50           |
| Two Panel                      | 95.5 x 95.5      | 0.06                                    | 4.60                   | 45.11                            | 30.08                 | LC PG30           |
| Three Panel                    | 107.5 x 82       | 0.17                                    | 6.06                   | 60.15                            | 40.10                 | LC PG40           |
| Four Panel                     | 139.75 x 82      | 0.10                                    | 4.59                   | 37.59                            | 25.06                 | LC PG25           |



Sliding Patio Door Thermal Performance

| Glass Options   | U-Factor | SHGC | VT   | CR | IECC <sup>1</sup> | Energy Star 7.0 |    |    |   |
|---|----------|------|------|----|-------------------|-----------------|----|----|---|
| Dual Pane Low-E Argon (Cardinal 270) - Tempered                         | 0.26     | 0.23 | 0.43 | 61 | Yes               | N               | NC | SC | S |
| Dual Pane Low-E (Cardinal 270) - Tempered                               | 0.29     | 0.23 | 0.43 | 58 | Yes               | -               | -  | -  | - |
| Dual Pane Clear - Tempered  | 0.40     | 0.49 | 0.51 | 45 | -                 | -               | -  | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270) - Tempered     | 0.24     | 0.22 | 0.40 | 66 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270) - Tempered     | 0.21     | 0.20 | 0.34 | 70 | Yes               | N               | NC | SC | S |
| Dual Pane Low-E Argon (SB60) - Tempered                                 | 0.26     | 0.25 | 0.45 | 56 | Yes               | N               | NC | -  | - |
| Dual Pane Low-E (SB60) - Tempered                                       | 0.29     | 0.25 | 0.45 | 53 | Yes               | -               | -  | -  | - |
| Dual Pane Clear - Tempered  | 0.40     | 0.47 | 0.50 | 43 | -                 | -               | -  | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Energy Advantage) - Tempered | 0.25     | 0.40 | 0.44 | 64 | Yes               | N               | NC | -  | - |
| Triple Pane Low-E / Clear / Low-E & Argon (Energy Advantage) - Tempered | 0.23     | 0.39 | 0.41 | 67 | Yes               | N               | NC | -  | - |
| Dual Pane Low-E Argon (270) - Tempered                                  | 0.26     | 0.23 | 0.43 | 57 | Yes               | N               | NC | SC | S |
| Dual Pane Low-E (270) - Tempered  | 0.29     | 0.23 | 0.43 | 54 | Yes               | -               | -  | -  | - |
| Dual Pane Clear - Tempered  | 0.39     | 0.49 | 0.51 | 44 | -                 | -               | -  | -  | - |
| Triple Pane Low-E / Clear / Clear & Argon (Cardinal 270) - Tempered     | 0.24     | 0.22 | 0.40 | 61 | Yes               | N               | NC | SC | S |
| Triple Pane Low-E / Clear / Low-E & Argon (Cardinal 270) - Tempered     | 0.21     | 0.20 | 0.34 | 65 | Yes               | N               | NC | SC | S |

<sup>1</sup> = Meets 2021 IECC and older in most northern zones

Thermal values are for standard glazing package offerings without grilles. Factors such as custom sizes, glass spacers, safety glass, grilles between the glass, and simulated divided lites (SDL) can affect the final values.

Sliding Patio Door Structural Performance (Dual and Triple Pane Glazing)

| Air, Water, and Structural Ratings | Frame Size Inches (wxh) | Configuration | Performance Grade | Performance Class |
|------------------------------------|-------------------------|---------------|-------------------|-------------------|
| Two Panel                          | 71.5 x 82               | Single        | PG50              | LC                |
| Two Panel                          | 95.5 x 95.5             | Single        | PG30              | LC                |
| Three Panel                        | 107.5 x 82              | Single        | PG40              | LC                |
| Four Panel                         | 139.75 x 82             | Single        | PG25              | LC                |