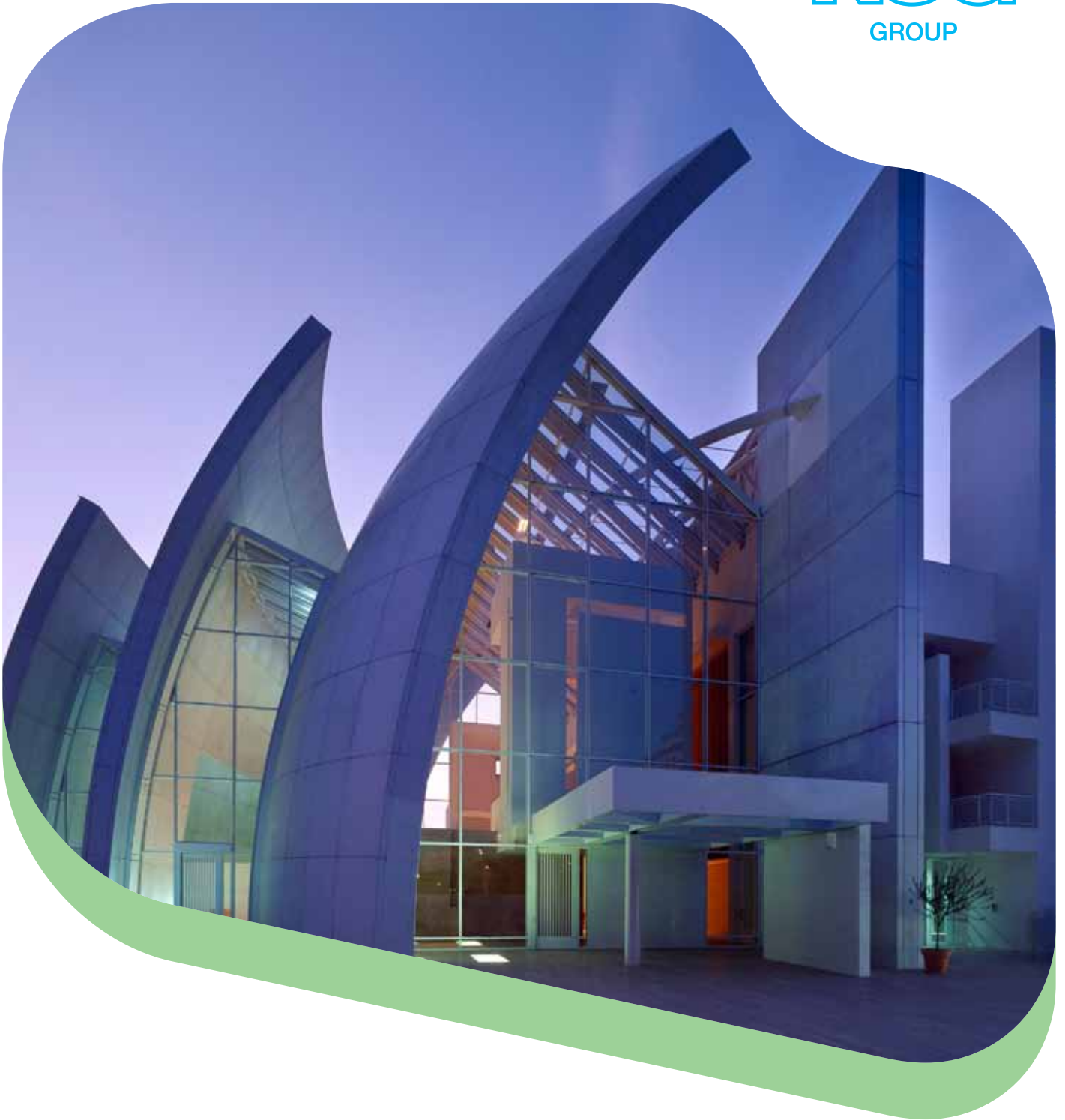




Low-e 4<sup>th</sup> Surface Commercial Technology  
Pilkington **Energy Advantage™** Low-e



## Low-e 4<sup>th</sup> Surface Commercial Technology with Pilkington **Energy Advantage™** Low-e.

**Lower U-factor • Improved Clarity • Greater Energy Savings.**

### Here's how it works.

Pilkington **Energy Advantage™** Low-e coatings applied to the #2 and #4 surfaces of an insulating unit reduce the center of glass U-factor by about 20%, compared to an IGU with a pyrolytic low-e and an uncoated clear lite. This proven technology improves thermal performance in a new or reglazed commercial building.

Durability is critical for coatings applied to the 4<sup>th</sup> surface of an insulating unit. Pyrolytic coatings are extremely durable and difficult to damage. Pilkington pyrolytic coating technology has been used on exposed surfaces successfully for over 20 years globally.

With superior clarity, unrivaled by any other pyrolytic glass, Pilkington **Energy Advantage™** has been used for more than 10 years in North America as a 4<sup>th</sup> Surface Low-e product.

### Features and Benefits

- Durability of a pyrolytic
- Low U-factor and reduced solar heat gain
- Superior thermal control
- Improved clarity
- High light transmittance
- Energy savings
- Easy to clean surface with standard techniques
- Superior aesthetics for any building
- Can help projects achieve LEED® credit
- No additional SKUs

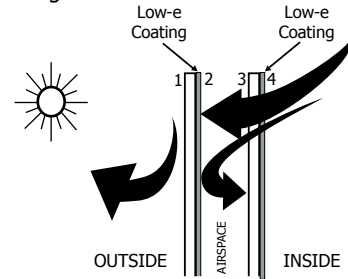
### Enhanced thermal performance without investing in triple-pane windows.

- Fewer low-e products to inventory, with installation on #2 and #4 surfaces
- No additional raw materials required
- No additional capital investments necessary
- Easily integrated into current fabrication process
- Lighter construction
- Less reflection than with triple glazing
- Durability of a pyrolytic
- No edge deletion required for an IGU
- Easily handled, tempered, cut, bent, laminated, insulated and heat-strengthened
- Virtually unlimited shelf-life

### How is glazing performance improved?

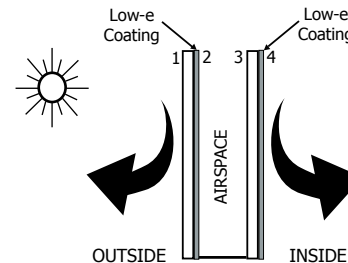
#### Cold Weather Conditions

The coating on the #2 surface reduces room heat (or far IR energy) loss by reflecting it back toward the space. By adding a second low-e coating to the #4 surface the thermal insulation is further improved. More infrared heat (room heat) is reflected back into the building.



#### Warm Weather Conditions

The low-e coating on the #4 surface reflects more solar heat than one lite of low-e glass, reducing cooling loads.



### Pyrolytic Power

Pilkington **Energy Advantage™** Low-e is coated using a pyrolytic process, which allows for the coating to be chemically-bonded to the glass at a molecular level. This process produces a coating which is extremely durable and will not scratch or degrade over time. The coating has been used globally for over 20 year with proven success.

## Performance Data <sup>1, 10</sup>

| Nominal Glass Thickness                                                                                                                                   |    | Visible Light <sup>2</sup> |             |        | Solar Energy <sup>2</sup>      |                            |                                    | U-Factor <sup>5</sup>    |       |                          |       |          |       | Solar Heat Gain Coefficient <sup>7</sup> | Shading Coefficient <sup>8</sup> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------|-------------|--------|--------------------------------|----------------------------|------------------------------------|--------------------------|-------|--------------------------|-------|----------|-------|------------------------------------------|----------------------------------|
| in.                                                                                                                                                       | mm | Transmittance <sup>3</sup> | Reflectance |        | Transmittance <sup>3,9</sup> % | Reflectance <sup>4</sup> % | UV Transmittance <sup>2,10</sup> % | U.S. Summer <sup>*</sup> |       | U.S. Winter <sup>*</sup> |       | European |       |                                          |                                  |
|                                                                                                                                                           |    |                            | Outside     | Inside |                                |                            |                                    | Air                      | Argon | Air                      | Argon | Air      | Argon |                                          |                                  |
|                                                                                                                                                           |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| Pilkington <b>Energy Advantage</b> <sup>™</sup> Outer Lite (#2 surface) and Pilkington <b>Optifloat</b> <sup>™</sup> Clear Inner Lite                     |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| 3/16                                                                                                                                                      | 5  | 74                         | 17          | 17     | 55                             | 14                         | 41                                 | 0.33                     | 0.28  | 0.33                     | 0.29  | 1.8      | 1.5   | 0.63                                     | 0.73                             |
| 1/4                                                                                                                                                       | 6  | 73                         | 16          | 17     | 52                             | 13                         | 37                                 | 0.33                     | 0.28  | 0.33                     | 0.29  | 1.8      | 1.5   | 0.62                                     | 0.71                             |
| 5/16                                                                                                                                                      | 8  | 71                         | 15          | 16     | 47                             | 12                         | 32                                 | 0.33                     | 0.28  | 0.33                     | 0.28  | 1.8      | 1.5   | 0.59                                     | 0.67                             |
| 3/8                                                                                                                                                       | 10 | 69                         | 15          | 16     | 43                             | 12                         | 29                                 | 0.32                     | 0.27  | 0.33                     | 0.28  | 1.8      | 1.5   | 0.56                                     | 0.64                             |
| 1/2                                                                                                                                                       | 12 | 67                         | 15          | 16     | 39                             | 11                         | 27                                 | 0.32                     | 0.28  | 0.32                     | 0.28  | 1.8      | 1.5   | 0.53                                     | 0.61                             |
| Pilkington <b>Energy Advantage</b> <sup>™</sup> Outer Lite (#2 surface) and Pilkington <b>Energy Advantage</b> <sup>™</sup> Inner Lite (#4 surface)       |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| 3/16                                                                                                                                                      | 5  | 69                         | 18          | 19     | 49                             | 15                         | 33                                 | 0.24                     | 0.21  | 0.26                     | 0.23  | 1.6      | 1.3   | 0.59                                     | 0.68                             |
| 1/4                                                                                                                                                       | 6  | 68                         | 17          | 18     | 47                             | 14                         | 29                                 | 0.24                     | 0.21  | 0.26                     | 0.23  | 1.5      | 1.3   | 0.58                                     | 0.66                             |
| 5/16                                                                                                                                                      | 8  | 66                         | 17          | 18     | 42                             | 13                         | 26                                 | 0.24                     | 0.21  | 0.26                     | 0.23  | 1.5      | 1.3   | 0.54                                     | 0.62                             |
| 3/8                                                                                                                                                       | 10 | 64                         | 16          | 17     | 38                             | 12                         | 23                                 | 0.24                     | 0.21  | 0.26                     | 0.22  | 1.5      | 1.3   | 0.51                                     | 0.59                             |
| 1/2                                                                                                                                                       | 12 | 63                         | 16          | 18     | 36                             | 11                         | 24                                 | 0.24                     | 0.21  | 0.26                     | 0.23  | 1.5      | 1.3   | 0.49                                     | 0.57                             |
| Double Silver Sputter Coat Low-e Outer Lite (#2 surface) and Pilkington <b>Energy Advantage</b> <sup>™</sup> Inner Lite (#4 surface)                      |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| 3/16                                                                                                                                                      | 5  | 66                         | 13          | 15     | 31                             | 32                         | 16                                 | 0.21                     | 0.17  | 0.23                     | 0.20  | 1.3      | 1.1   | 0.36                                     | 0.42                             |
| 1/4                                                                                                                                                       | 6  | 65                         | 12          | 14     | 30                             | 30                         | 14                                 | 0.21                     | 0.17  | 0.23                     | 0.19  | 1.3      | 1.1   | 0.36                                     | 0.41                             |
| 5/16                                                                                                                                                      | 8  | 63                         | 12          | 14     | 29                             | 25                         | 13                                 | 0.21                     | 0.17  | 0.23                     | 0.19  | 1.3      | 1.1   | 0.35                                     | 0.40                             |
| 3/8                                                                                                                                                       | 10 | 62                         | 12          | 14     | 27                             | 23                         | 12                                 | 0.21                     | 0.17  | 0.23                     | 0.19  | 1.3      | 1.0   | 0.35                                     | 0.40                             |
| 1/2                                                                                                                                                       | 12 | 61                         | 11          | 13     | 26                             | 18                         | 11                                 | 0.21                     | 0.17  | 0.23                     | 0.19  | 1.3      | 1.0   | 0.34                                     | 0.39                             |
| Triple Silver Sputter Coat Low-e Outer Lite (#2 surface) and Pilkington <b>Energy Advantage</b> <sup>™</sup> Inner Lite (#4 surface)                      |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| 3/16                                                                                                                                                      | 5  | 59                         | 13          | 16     | 22                             | 39                         | 4                                  | 0.20                     | 0.16  | 0.23                     | 0.19  | 1.3      | 1.0   | 0.26                                     | 0.30                             |
| 1/4                                                                                                                                                       | 6  | 58                         | 13          | 15     | 22                             | 36                         | 4                                  | 0.20                     | 0.16  | 0.23                     | 0.19  | 1.3      | 1.0   | 0.26                                     | 0.30                             |
| 5/16                                                                                                                                                      | 8  | 56                         | 12          | 15     | 21                             | 31                         | 4                                  | 0.20                     | 0.16  | 0.23                     | 0.19  | 1.3      | 1.0   | 0.26                                     | 0.30                             |
| 3/8                                                                                                                                                       | 10 | 55                         | 12          | 14     | 20                             | 28                         | 3                                  | 0.20                     | 0.16  | 0.22                     | 0.19  | 1.3      | 1.0   | 0.26                                     | 0.30                             |
| 1/2                                                                                                                                                       | 12 | 54                         | 12          | 15     | 19                             | 22                         | 3                                  | 0.20                     | 0.16  | 0.22                     | 0.19  | 1.3      | 1.0   | 0.26                                     | 0.30                             |
| Pilkington <b>Energy Advantage</b> <sup>™</sup> OW Outer Lite (#2 surface) and Pilkington <b>Optiwhite</b> <sup>™</sup> Low Iron Inner Lite               |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| 1/4                                                                                                                                                       | 6  | 76                         | 17          | 18     | 68                             | 17                         | 59                                 | 0.33                     | 0.28  | 0.33                     | 0.29  | 1.8      | 1.5   | 0.70                                     | 0.81                             |
| Pilkington <b>Energy Advantage</b> <sup>™</sup> OW Outer Lite (#2 surface) and Pilkington <b>Energy Advantage</b> <sup>™</sup> OW Inner Lite (#4 surface) |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| 1/4                                                                                                                                                       | 6  | 70                         | 18          | 20     | 60                             | 18                         | 47                                 | 0.24                     | 0.21  | 0.26                     | 0.23  | 1.5      | 1.3   | 0.66                                     | 0.76                             |
| Double Silver Sputter Coat Low-e Outer Lite (#2 surface) and Pilkington <b>Energy Advantage</b> <sup>™</sup> OW Inner Lite (#4 surface)                   |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| 1/4                                                                                                                                                       | 6  | 66                         | 13          | 15     | 32                             | 30                         | 17                                 | 0.21                     | 0.17  | 0.23                     | 0.19  | 1.3      | 1.1   | 0.37                                     | 0.42                             |
| Triple Silver Sputter Coat Low-e Outer Lite (#2 surface) and Pilkington <b>Energy Advantage</b> <sup>™</sup> OW Inner Lite (#4 surface)                   |    |                            |             |        |                                |                            |                                    |                          |       |                          |       |          |       |                                          |                                  |
| 1/4                                                                                                                                                       | 6  | 59                         | 13          | 16     | 23                             | 36                         | 5                                  | 0.20                     | 0.16  | 0.23                     | 0.19  | 1.3      | 1.0   | 0.26                                     | 0.30                             |

An insulating unit consists of two lites of equal glass thickness, and a 1/2 in. airspace.

\*U.S. U-Factor (Btu/hr.sq ft. °F) is based on NFRC/ASTM standards, \*\*European U-Factor (W/sq m K) is based on EN 410/673 (CEN) standard.

All performance values are center-of-glass values calculated using the LBNL Window 6.3 program. See Pilkington Architectural Product Guide for explanation of references - <sup>1, 10</sup>. The 'OW' descriptor in 'Pilkington **Energy Advantage**<sup>™</sup> OW' indicates the base substrate is low iron, such as Pilkington **Optiwhite**<sup>™</sup>.

Performance Data <sup>1, 10</sup>

|                                                                                                                                                          | Nominal Glass Thickness |    | Visible Light <sup>2</sup>   |                             |        | Solar Energy <sup>2</sup>    |                            |                                 | U-Factor <sup>5</sup> |       |             |       |                       |       | Solar Heat Gain Coefficient <sup>7</sup> | Shading Coefficient <sup>8</sup> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----|------------------------------|-----------------------------|--------|------------------------------|----------------------------|---------------------------------|-----------------------|-------|-------------|-------|-----------------------|-------|------------------------------------------|----------------------------------|
|                                                                                                                                                          |                         |    | Transmittance <sup>3</sup> % | Reflec-tance <sup>4</sup> % |        | Transmittance <sup>3</sup> % | Reflectance <sup>4</sup> % | UV Transmittance <sup>2</sup> % | U.S. Summer           |       | U.S. Winter |       | European <sup>6</sup> |       |                                          |                                  |
|                                                                                                                                                          | in.                     | mm |                              | Outside                     | Inside |                              |                            |                                 | Air                   | Argon | Air         | Argon | Air                   | Argon |                                          |                                  |
| Pilkington <b>Solar-E™</b> (coating on #2 surface) outer lite and Pilkington <b>Energy Advantage™</b> Low-e (coating on the #4 surface) inner lite       |                         |    |                              |                             |        |                              |                            |                                 |                       |       |             |       |                       |       |                                          |                                  |
| Clear                                                                                                                                                    | 1/4                     | 6  | 49                           | 11                          | 17     | 32                           | 9                          | 26                              | 0.24                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.41                                     | 0.47                             |
|                                                                                                                                                          | 5/16                    | 8  | 48                           | 11                          | 17     | 29                           | 9                          | 23                              | 0.24                  | 0.21  | 0.26        | 0.23  | 1.5                   | 1.3   | 0.40                                     | 0.45                             |
| Pilkington <b>Solar-E™</b> Plus (coating on #2 surface) outer lite and Pilkington <b>Energy Advantage™</b> Low-e (coating on the #4 surface) inner lite  |                         |    |                              |                             |        |                              |                            |                                 |                       |       |             |       |                       |       |                                          |                                  |
| Blue-Green                                                                                                                                               | 1/4                     | 6  | 34                           | 8                           | 17     | 18                           | 6                          | 12                              | 0.25                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.27                                     | 0.31                             |
|                                                                                                                                                          | 5/16                    | 8  | 32                           | 7                           | 16     | 15                           | 6                          | 9                               | 0.24                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.24                                     | 0.28                             |
| EverGreen                                                                                                                                                | 1/4                     | 6  | 31                           | 8                           | 17     | 13                           | 6                          | 5                               | 0.25                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.22                                     | 0.25                             |
|                                                                                                                                                          | 5/16                    | 8  | 28                           | 7                           | 17     | 11                           | 5                          | 3                               | 0.24                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.19                                     | 0.22                             |
| Graphite Blue                                                                                                                                            | 1/4                     | 6  | 23                           | 6                           | 16     | 17                           | 6                          | 13                              | 0.25                  | 0.22  | 0.26        | 0.20  | 1.6                   | 1.3   | 0.29                                     | 0.34                             |
|                                                                                                                                                          | 5/16                    | 8  | 25                           | 7                           | 16     | 16                           | 6                          | 11                              | 0.24                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.26                                     | 0.29                             |
| Arctic Blue                                                                                                                                              | 1/4                     | 6  | 25                           | 6                           | 16     | 13                           | 5                          | 7                               | 0.25                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.21                                     | 0.25                             |
|                                                                                                                                                          | 5/16                    | 8  | 22                           | 6                           | 16     | 11                           | 5                          | 5                               | 0.24                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.19                                     | 0.22                             |
| Grey                                                                                                                                                     | 1/4                     | 6  | 20                           | 6                           | 17     | 14                           | 6                          | 8                               | 0.25                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.23                                     | 0.26                             |
|                                                                                                                                                          | 5/16                    | 8  | 16                           | 6                           | 16     | 11                           | 5                          | 5                               | 0.24                  | 0.22  | 0.26        | 0.23  | 1.6                   | 1.3   | 0.20                                     | 0.23                             |
| Pilkington <b>Eclipse Advantage™</b> (coating on #2 surface) outer lite and Pilkington <b>Energy Advantage™</b> Low-e (coating on #4 surface) inner lite |                         |    |                              |                             |        |                              |                            |                                 |                       |       |             |       |                       |       |                                          |                                  |
| Clear                                                                                                                                                    | 1/4                     | 6  | 56                           | 30                          | 30     | 41                           | 22                         | 19                              | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.51                                     | 0.58                             |
|                                                                                                                                                          | 5/16                    | 8  | 55                           | 29                          | 30     | 37                           | 20                         | 17                              | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.48                                     | 0.55                             |
| Blue-Green                                                                                                                                               | 1/4                     | 6  | 48                           | 22                          | 29     | 26                           | 12                         | 10                              | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.35                                     | 0.40                             |
|                                                                                                                                                          | 5/16                    | 8  | 44                           | 20                          | 29     | 21                           | 11                         | 8                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.30                                     | 0.35                             |
| EverGreen                                                                                                                                                | 1/4                     | 6  | 40                           | 18                          | 30     | 18                           | 9                          | 5                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.26                                     | 0.30                             |
|                                                                                                                                                          | 5/16                    | 8  | 36                           | 15                          | 29     | 14                           | 8                          | 3                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.23                                     | 0.26                             |
| Arctic Blue                                                                                                                                              | 1/4                     | 6  | 33                           | 14                          | 29     | 17                           | 9                          | 7                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.26                                     | 0.30                             |
|                                                                                                                                                          | 5/16                    | 8  | 27                           | 11                          | 29     | 13                           | 7                          | 5                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.22                                     | 0.25                             |
| Bronze                                                                                                                                                   | 1/4                     | 6  | 32                           | 13                          | 29     | 24                           | 11                         | 7                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.34                                     | 0.39                             |
|                                                                                                                                                          | 5/16                    | 8  | 26                           | 10                          | 28     | 19                           | 9                          | 5                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.29                                     | 0.33                             |
| Grey                                                                                                                                                     | 1/4                     | 6  | 27                           | 11                          | 29     | 20                           | 9                          | 7                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.30                                     | 0.35                             |
|                                                                                                                                                          | 5/16                    | 8  | 21                           | 8                           | 29     | 15                           | 7                          | 5                               | 0.25                  | 0.23  | 0.27        | 0.24  | 1.6                   | 1.4   | 0.25                                     | 0.29                             |

An insulating unit consists of two lites of equal glass thickness, and a 1/2 in. airspace.

\*U.S. U-Factor (Btu/hr.sq ft. °F) is based on NFRC/ASTM standards, \*\*European U-Factor (W/sq m K) is based on EN 410/673 (CEN) standard.

All performance values are center-of-glass values calculated using the LBNL Window 6.3 program. See Pilkington Architectural Product Guide for explanation of references - <sup>1, 10</sup>.

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