

# TINTED GLASS **USES AND APPLICATIONS**

**DATA SHEET /** Quebec

Version 2.0

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 **MULTIVER**  
Cutting edge of the glass industry



# Glass offered by Multiver

## TINTED GLASS

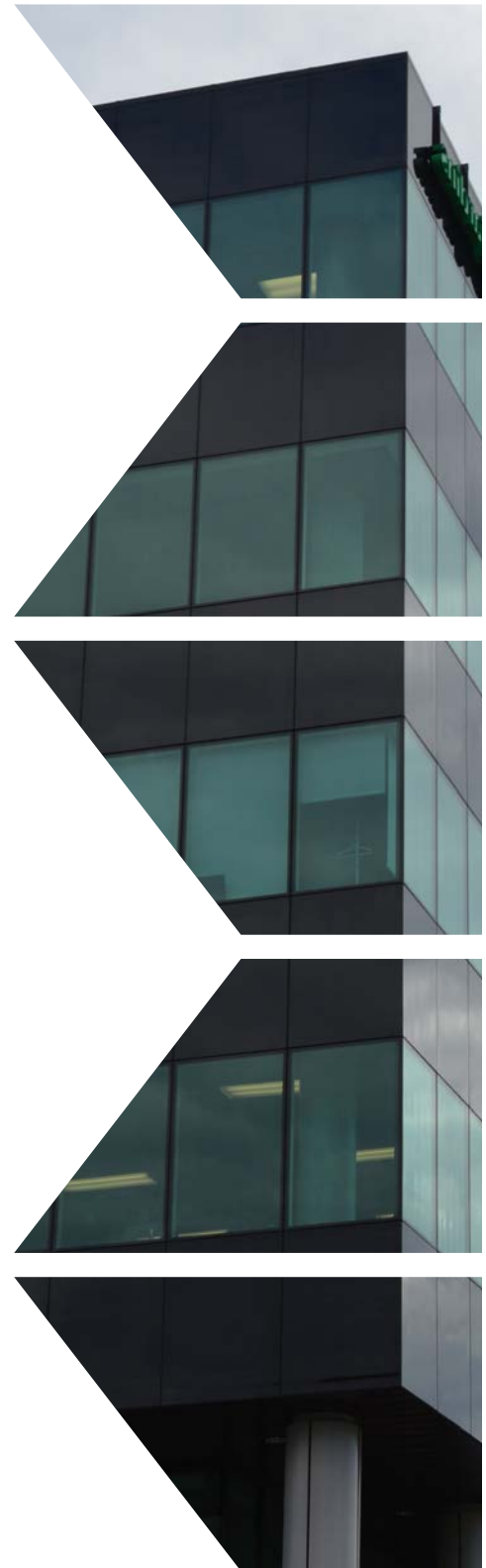
What is tinted glass? During the manufacturing process, glass manufacturers add certain **metallic oxides to the glass composition**, which gives the glass a uniform and translucent colour. For example, iron, cobalt or selenium oxide allows manufacturers to achieve various shades of blue, green, bronze or grey. The addition of metallic oxides does not change in any way the physical properties of the glass. Multiver offers a wide range of colours.

### STANDARDS AND CERTIFICATES

#### Multiver meets the following requirements :

- ASTM C1036 - Flat Glass
- CAN/CGSB-12.3-M91 - Flat, Clear Float Glass

\*Other standards and certificates may apply.

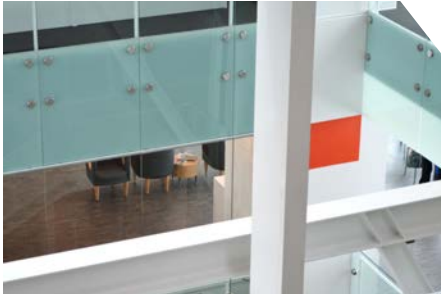




# USES

Tinted glass can be used in a number of applications, such as :

## Glass partitions



## Windows and curtain walls



## Spandrel glass



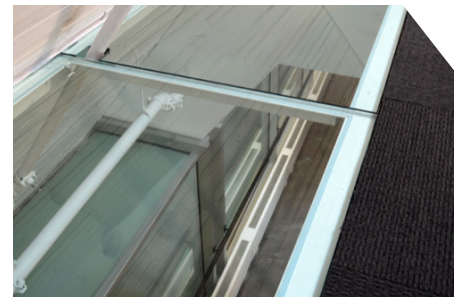
## Balustrades



## Skylights



## Glass floors



## Door glazing



## Automotive glass



## Decorative crafts







# BENEFITS





- ▶ From an **esthetic** point of view, tinted glass gives buildings a distinguished and/or private look.
- ▶ **It helps reduce heat gain**, thus reducing air conditioning costs and enhancing occupants' well-being (see solar heat gain coefficient in Table 2 on tinted glass performance data).
  - ▶ It **reduces ultraviolet radiation** inside the building.
  - ▶ **Extremely versatile**, this product can be utilized in commercial, residential and institutional projects.
  - ▶ **The wide variety** of tinted glass allows for a multitude of visual effects.
    - ▶ It can be **combined with low emissivity (low-e) glass** to improve thermal resistance (R-value) and overall performance of the insulated unit. Virtually unlimited combinations allow to modify glass performance.
    - ▶ **Tinted glass can be used in monolithic form as well as in double- or triple-glazed insulated glass units. It can also be sandblasted, silk-screened, shaped, laminated, bevelled and enamelled.**
  - ▶ **Indoors**, it can be used for its esthetic appeal and to complement the furniture and decoration.
  - ▶ **Its acoustic and mechanical performance** is similar to that of standard glass of the same thickness and size.
- ▶ When tinted glass is **combined in an insulated glass unit with spandrel glass in position 4**, the resulting combination can create a colour effect similar to that of insulated units with tinted glass of a building in daylight.
- ▶ Considering the lower light transmittance associated with tinted glass, **interior glare is also reduced** while providing privacy from the outside.
- ▶ It can be assembled with **Privavision integral blinds as well as smart glass**, thus providing the ultimate comfort.



## SUPPLIERS OF AVAILABLE TINTED PRODUCTS

Multiver offers a large variety of tinted glass products, most of which are listed below. Products may be added to the list or removed from it, depending on demand.

**TABLE 1 :** Name and thickness of available glass products

|    |                |  |               |  |                 |  |      |
|---|----------------|---|---------------|--|-----------------|---|------|
| SolarShield®<br>Forest Green  | 6 mm           | CrystalGray   | 3-4-6-8-10 mm | Optifloat™<br>Arctic Blue  | 6-10 mm         | Atlantica®  | 6 mm |
| SolarShield®<br>Pure Green  | 3-5-6 mm       | Guardian Green  | 3-4-5-6-8 mm  | Optifloat™<br>Blue-Green   | 4-5-6-8-10 mm   | Azuria®   | 6 mm |
| SolarShield®<br>Meadow Green  | 6 mm           | Midnight Gray   | 3-4-5-6 mm    | Optifloat™<br>Bronze   | 3-4-5-6-8-10 mm | Pacifica®   | 6 mm |
| SolarShield®<br>Pure Bronze   | 3-5-6-10-12 mm | Twilight Green  | 3-5-6-8 mm    | Ever Green™  | 4-5-6-8-10 mm   | Solarblue®  | 6 mm |
| SolarShield®<br>Pure Grey   | 3-5-6-10-12 mm | Green   | 3-5-6 mm      | Graphite Blue™   | 6-8-10 mm       | Solar Bronze®   | 6 mm |
| *Certain glass products are not kept in stock. A minimum quantity is required for some products.<br><br>*Several other tinted glass products are available. For further information, please contact us. |                |   |               | Optifloat™<br>Grey   | 3-4-5-6-8-10 mm | Solar Gray®   | 6 mm |
|   |                |   |               | Optifloat™<br>Green  | 3-4-5-6-8-10 mm | Solexia®  | 6 mm |
|   |                |   |               | SuperGrey™   | 6 mm            | GrayLite®   | 6 mm |

**TABLE 2 :** Tinted glass performance data ([next page](#))

Below is a comparative table of various possible performance aspects of tinted glass combined or not with low-e glass. We compared a slightly lighter grey (CrystalGray) glass with a bronze (PureBronze) and a green (GuardianGreen) glass. By varying the glass composition, you can obtain high-performance products that meet your specific needs. Performance data were collected using Window 6.3, an independent software by LBNL specially designed to determine the performance of different products.



| PRODUCT   | U-VALUE<br>BTU/H-<br>FT <sup>2</sup> -°F | R-VALUE<br>H-FT <sup>2</sup> -<br>°F/BTU | TRANSMITTANCE %  |                  |                   | VISIBLE LIGHT<br>REFLECTANCE% |      | SHADING<br>COEF. | SOLAR<br>HEAT<br>GAIN<br>COEF. | RELATIVE<br>HEAT<br>GAIN<br>BTU/H-<br>FT <sup>2</sup> |
|---|--|--|------------------|------------------|-------------------|-------------------------------|------|------------------|--------------------------------|---|
|   |  |  | VISIBLE<br>LIGHT | SOLAR<br>TRANSM. | UV<br>TDW-<br>ISO | OUT                           | IN   |                  |                                |   |
| <b>CLEAR GLASS</b>  |  |  |                  |                  |                   |                               |      |                  |                                |   |
| - 6 mm clear<br>- 13.39 mm argon<br>- 6 mm clear  | 0.445                                    | 2.2                                      | 80.1             | 65.7             | 71.0              | 14.9                          | 14.8 | 0.84             | 0.73                           | 175.5   |
| <b>GREY GLASS</b>   |  |  |                  |                  |                   |                               |      |                  |                                |   |
| - 6 mm CrystalGray<br>- 13.39 mm argon<br>- 6 mm clear  | 0.445                                    | 2.2                                      | 58.1             | 44.8             | 50.8              | 9.9                           | 13.3 | 0.63             | 0.55                           | 132.6   |
| - 6 mm CrystalGray<br>- 13.39 mm argon<br>- 6 mm Econover<br>Select 63 (surf. 3)  | 0.254                                    | 3.9                                      | 55.9             | 33.5             | 46.6              | 8.4                           | 10.3 | 0.50             | 0.43                           | 102.5   |
| - 6 mm Econover<br>SN-68 on Crystal<br>Gray (surf. 2)<br>- 13.39 mm argon<br>- 6 mm clear   | 0.242                                    | 4.1                                      | 49.3             | 23.5             | 40.1              | 7.8                           | 11.1 | 0.33             | 0.29                           | 69.2  |
| <b>GREEN GLASS</b>  |  |  |                  |                  |                   |                               |      |                  |                                |   |
| - 6 mm Guardian<br>Green<br>- 13.39 mm argon<br>- 6 mm clear  | 0.445                                    | 2.2                                      | 67.9             | 37.5             | 54.4              | 11.9                          | 13.9 | 0.55             | 0.48                           | 116.4   |
| - 6 mm Guardian<br>Green<br>- 13.39 mm argon<br>- 6 mm Econover<br>Select 63 (surf. 3)  | 0.254                                    | 3.9                                      | 65.4             | 30.4             | 50.4              | 9.8                           | 10.9 | 0.45             | 0.39                           | 93.0  |
| - 6 mm Econover<br>SN-68 on Guardian<br>Green (surf. 2)<br>- 13.39 mm argon<br>- 6 mm clear   | 0.242                                    | 4.1                                      | 57.6             | 23.6             | 43.5              | 8.9                           | 11.5 | 0.33             | 0.29                           | 69.7  |
| <b>BRONZE GLASS</b>   |  |  |                  |                  |                   |                               |      |                  |                                |   |
| - 6 mm Bronze<br>- 13.39 mm argon<br>- 6 mm clear   | 0.445                                    | 2.2                                      | 48.2             | 39.4             | 38.0              | 7.9                           | 12.5 | 0.58             | 0.50                           | 122.4   |
| - 6 mm Bronze<br>- 13.39 mm argon<br>- 6 mm Econover<br>Select 63 (surf. 3)   | 0.254                                    | 3.9                                      | 46.4             | 28.8             | 35.0              | 6.8                           | 9.6  | 0.44             | 0.38                           | 91.3  |
| - 6 mm Bronze<br>- 12.70 mm argon<br>- 6 mm Econover<br>Select 63 (surf. 3)<br>- 12.70 mm argon<br>- 6 mm Econover<br>Select 63 (surf. 5) | 0.129                                    | 7.8                                      | 40.1             | 21.2             | 28.9              | 7.8                           | 12.8 | 0.36             | 0.31                           | 73.6  |



## MANUFACTURING SIZE

Due to the wide selection of products available as well as the number of suppliers, maximum sizes may vary depending on the suppliers and demand. Minimum sizes may also vary depending on intended uses.

That being said, the average maximum size of a glass sheet is approximately **96 inches X 144 inches** (2,438 mm X 3,657 mm). Upon request, we can obtain glass sheets of 102 inches X 168 inches (2,590 mm X 4,267 mm).

## MAINTENANCE

Once the tinted glass is installed, **it is recommended that all exposed surfaces be cleaned, if needed**, in order to preserve the esthetic qualities of the product. Rub gently with a soft cloth, using cold or warm water and non-aggressive chemicals for all glass surfaces. Caution should be exercised when choosing cleaners. Abrasive cleaners must never be used as they can cause damage to the glass surface. Several products are specifically designed to clean glass. Metallic objects should not be used because they could scratch the glass.

**Cleaners containing solvents must never be used.**

Exposed glass surfaces must be protected during the construction or renovation of the building to minimize the risk of scratches and glass breakage.

## GLAZING REPLACEMENT

To help us identify the insulated unit that needs to be replaced, we strongly recommend that you **look at the spacer in the insulated unit**. You will then know **who was the original manufacturer of the unit as well as its year of manufacture**. We also require the **project name and location** to conduct extensive research.

In the case of tempered or heat-strengthened monolithic tinted glass, **you should be able to see a laser-engraved logo** in one of the corners of the glass, that is, if it is not covered. A date as well as the name of the company that tempered the glass should also be indicated.



Multiver Logo - Tempered glass

Slight **glass colour variations** can occur during the manufacturing process and result in a colour different from the original tint, in the event of a replacement.



## USEFUL INFORMATIONS

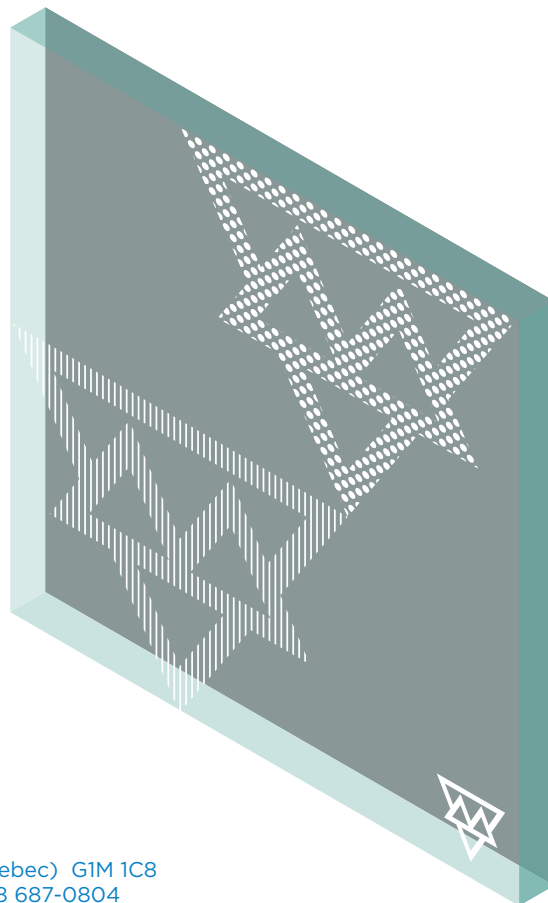
It is essential to **always ensure the compatibility of sealants** that are close to or in contact with Multiver products. Failure to comply with this instruction could result in the voiding of the Multiver warranty. Consult our documents on sealant compatibility to avoid potential problems with our products.

To prevent thermal stress breakage and increase the safety factor, **tinted glass can be heat-strengthened, tempered and/or laminated.** Due to its colour, tinted glass absorbs more heat than standard clear glass, thus increasing the risk of thermal stress breakage. A laser-engraved logo appears at one of the edges of all tempered and heat-strengthened glass products.

Depending on the thickness of a given tinted glass, its colour will be more or less intense. It is therefore **recommended that the same glass thickness be used for a given project**, unless the designer wishes to produce such effect.

**The chosen glass thickness and tint as well as its level of reflection, the building's surroundings, the lighting and many other factors** significantly influence the appearance of the selected colour. It is recommended to **ask that samples be provided** (see the Sample Request form) before making your final decision on tinted glass.

**With our glass etching (sandblasted designs) and silk-screen processes,** you can choose any design and we will transfer it onto glass. You can also pick a Pantone or RAL colour of your choice.







## ADVICE ON APPLICATIONS WITH LAMINATED GLASS

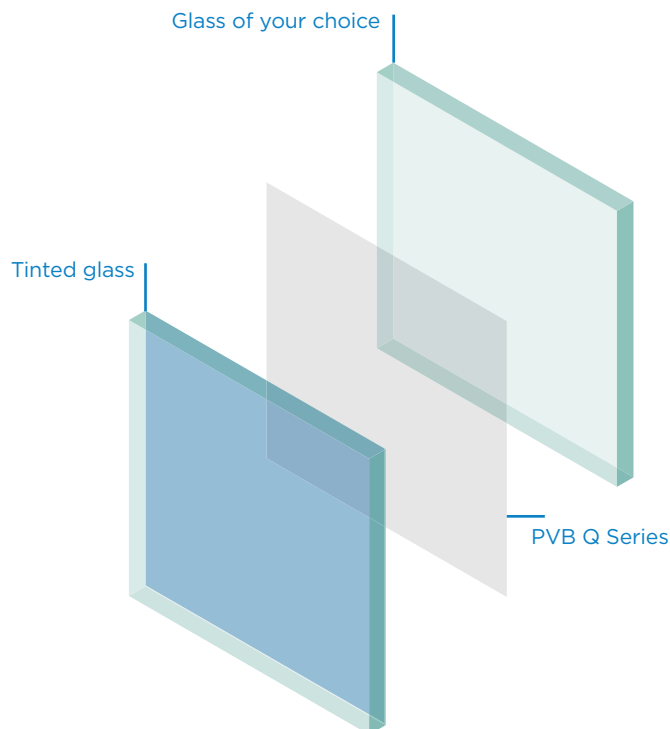
Here are a few options we recommend :

### FOR ENHANCED ACOUSTIC PERFORMANCE :

Tinted glass laminated with an acoustic polyvinyl butyral interlayer, commonly known as **Saflex® Q series acoustic PVB interlayer** (see the Laminated Glass document), and laminated with another type of glass of your choice. Several layers can be laminated, offering virtually endless combination possibilities.

### PURPOSE :

Reducing inside and outside noise opposite insulated glass units, glass partitions or even skylights.

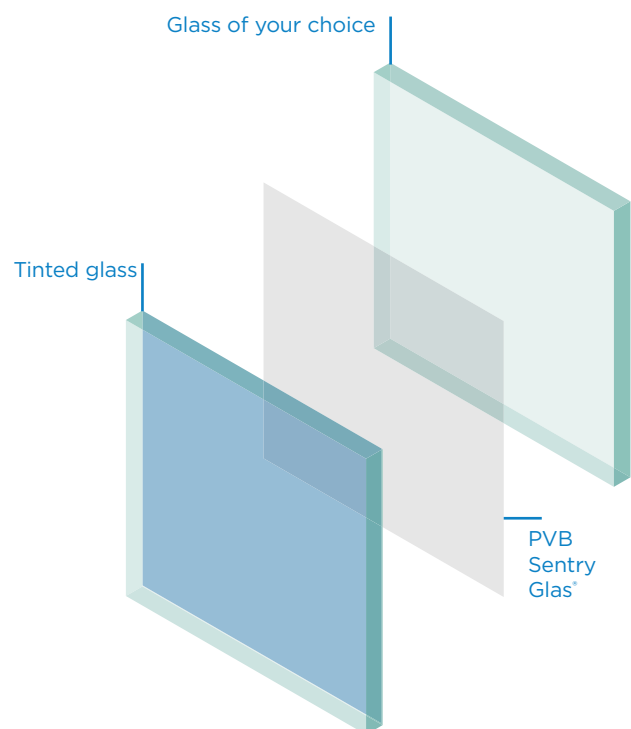


### TO INCREASE GLASS SAFETY FACTOR AND MECHANICAL STRENGTH :

Tinted glass laminated to a **PVB DuPont™ SentryGlas®** interlayer, and laminated with another type of glass. PVB SentryGlas® is nearly 100 times stiffer and five times stronger than standard PVB.

### PURPOSE :

Tinted balustrades, insulated glass units resistant to impacts, powerful wind gusts, gunfire, explosions, vandalism, falling broken glass, etc. Useful for protecting valuables against theft. Note that other combinations should be considered to meet your specific needs.





## ADVICE ON APPLICATIONS WITH LAMINATED GLASS

### FOR AN OPAQUE GLAZING OR ORIGINAL COLOURS :

Tinted glass laminated to **an opaque black or white PVB interlayer and/or a Saflex® Vanceva® colour PVB interlayer**, and laminated with another type of glass of your choice. To discover the impressive range of colours we offer, go to Vanceva's Web site ([www.vanceva.com](http://www.vanceva.com)). Once again, numerous combinations are possible.

### PURPOSE :

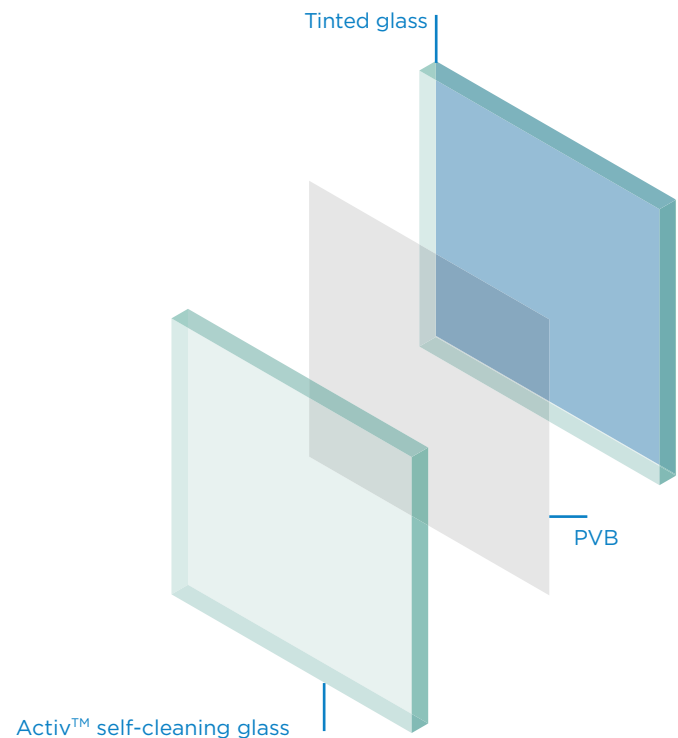
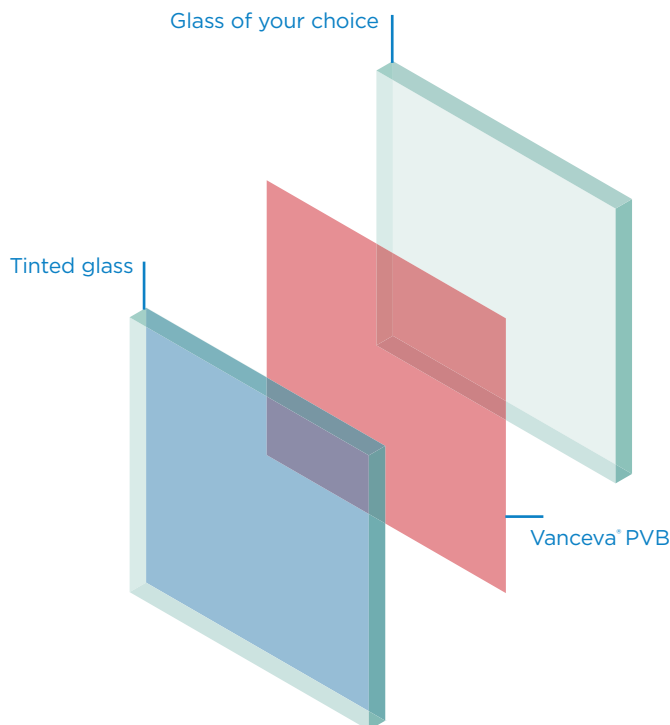
There is a whole variety of uses to choose from for both indoor and outdoor glazing designs that are anything but ordinary.

### TO COMBINE REFLECTIVE GLASS WITH SELF-CLEANING GLASS :

**Activ™ self-cleaning glass for indoor or outdoor use** offered by Multiver laminated to a PVB interlayer and tinted glass. This will provide you with a glass product of the colour of your choice that will require minimum maintenance. Self-cleaning glass also has recognized antibacterial properties.

### PURPOSE :

For institutional, commercial or residential projects, for indoor and outdoor use, depending on your needs.





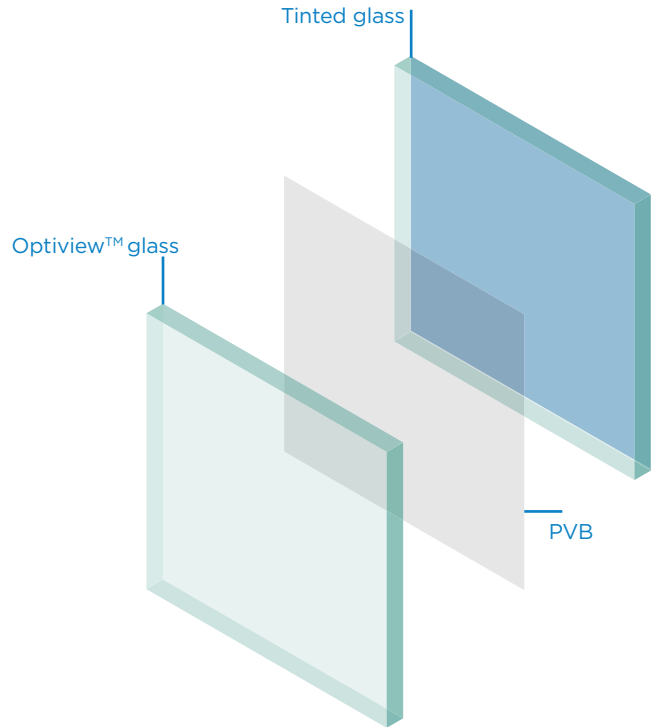
## ADVICE ON APPLICATIONS WITH LAMINATED GLASS

### TO REDUCE GLARE :

**OptiView™ anti-reflective glass** laminated to a PVB interlayer of your choice as well as tinted glass. By reducing reflections and increasing visible light transmittance, this product offers better visibility through the glass.

### PURPOSE :

For any projects where reflections are undesirable, such as condos, museums, storefronts, car dealerships, etc.





This document gives a general description of the product. For further information, please contact an authorized supplier of Multiver products. The use of any of the products mentioned here is the sole responsibility of the users. Multiver assumes no responsibility for the use of its products.

