

MULTIVER
RESIDENTIAL GLASS

PRACTICAL GUIDE

Quebec

Version 2.0

MULTIVER Ltd
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tel. : 1 800 463-2810 and fax : 418 687-0804



MULTIVER
Cutting edge of the glass industry

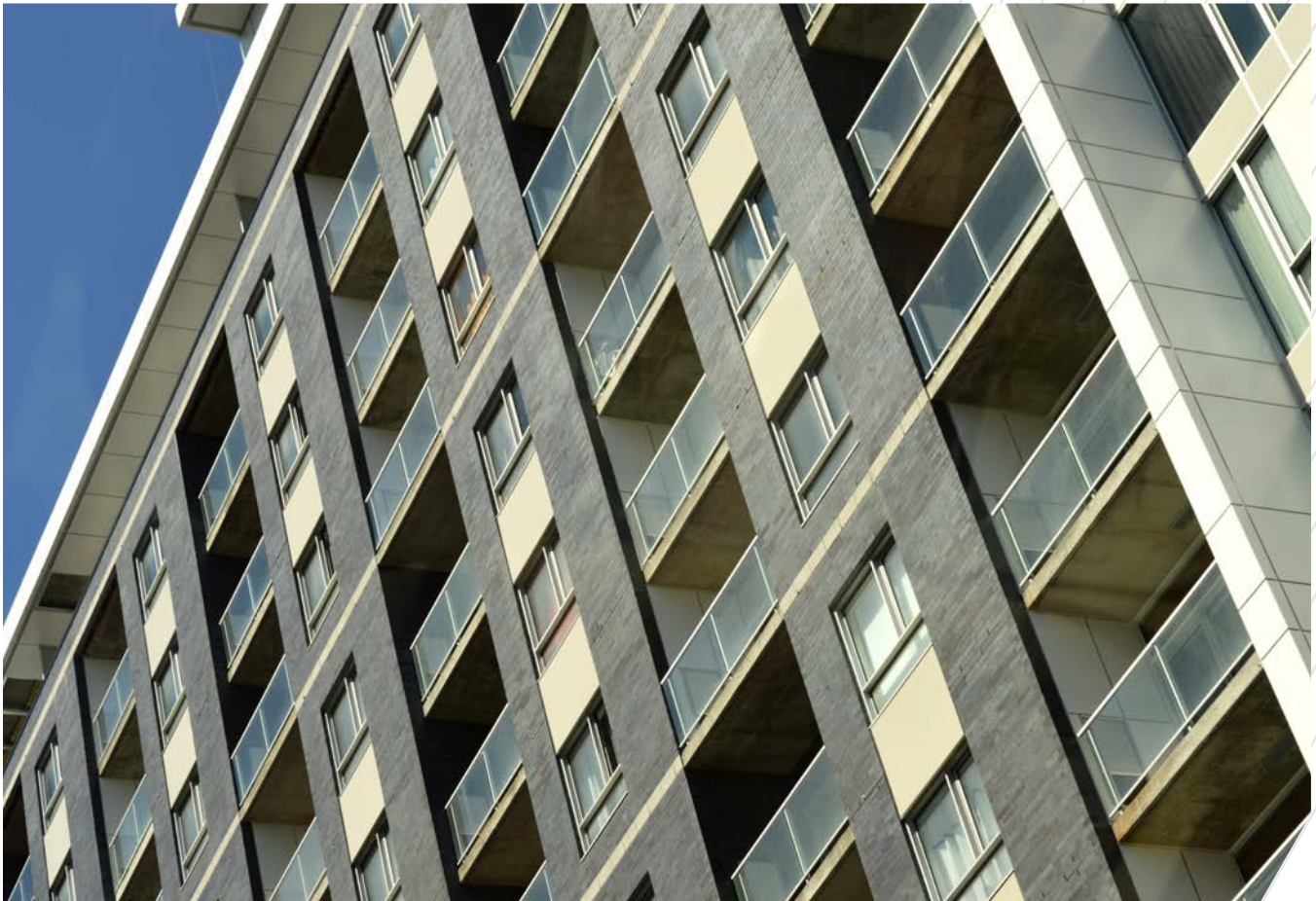


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RESIDENTIAL GLASS

This document is intended to address the most frequent questions and issues concerning insulated glass units designed for the manufacture of residential doors and windows. This document can therefore be helpful to salespersons, service advisors and procurement managers of any company that manufactures fenestration products.

Remember! Our sales department is always available to advise you and answer any questions you may have.



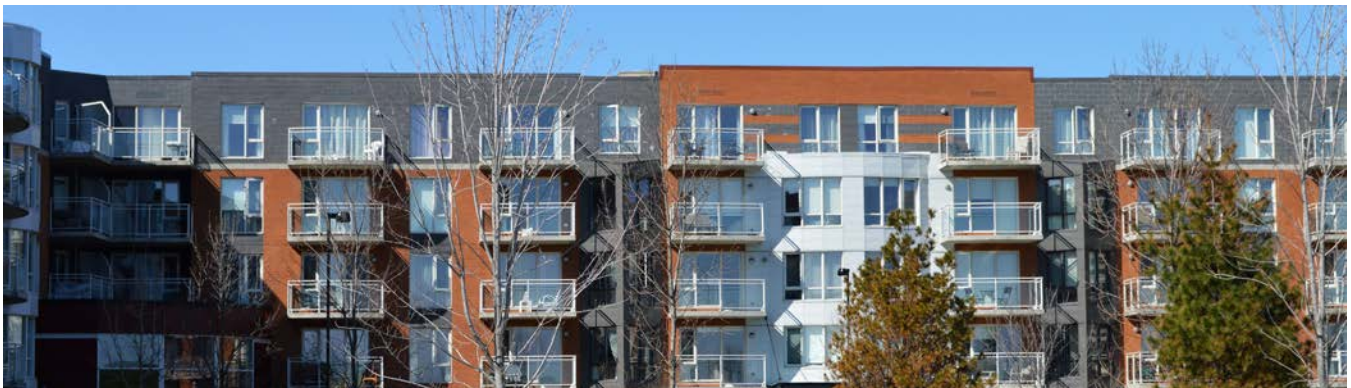


Information required to **PLACE AN ORDER WITH MULTIVER**

By fax (1 418 687-0804) or by email (commandes@multiver.ca) :

- ▶ A **purchase order #** (Multiver recommends that you use sequence #s, for your own benefit, and avoid using names like “Leblanc” to minimize the risk of duplicate orders).
- ▶ The **quantity** for each item.
- ▶ The **type of glass** (in the case of an insulated glass unit, we need to know the type of glass for each glass pane included in the insulated unit).
- ▶ The **type of spacer** (consult our Spacers document available on Multiver’s Web site).
- ▶ The desired **total thickness**.
- ▶ Any **other selected options**, e.g. a specific grille, shape, tinted, reflective or low emissivity (low-e) glass.
- ▶ The desired **delivery date**.
- ▶ The **contact information of the person to contact** if we have any questions.

You have to until noon the day after you place your order to modify or cancel it. Should you need to modify or cancel your order, it is always better to contact our sales department by telephone (we will also ask that you fax or email us your request).



L'avantage Residence - Multiver residential glass



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COLOURED GLASS

COLOUR

Since the colour is in the glass composition, the thicker the glass, the more intense the colour. Therefore, when ordering several insulated glass units for a single project, remember to order the same thickness (greater thickness required) for all your glass products to ensure a uniform colour. For example : your project includes a number of insulated glass units, one of which is larger than 3.85 m². Considering that this unit must be made of 6 mm thick glass, all of your glass products for this project will have to be 6 mm thick to ensure a uniform colour.

Warning : the colour changes according to glass thickness.

STANDARD THICKNESSES AVAILABLE

- 3 mm** = Grey, bronze and green
- 4 mm** = None
- 5 mm** = Grey, bronze and green
- 6 mm** = All (consult our Web site or sales department for a complete price list)
- 10 mm** = Grey, bronze and green

DEFAULT POSITION

Multiver always positions coloured/ tinted glass on the outer pane of glass units, unless the client requests that it be positioned otherwise.

COMBINED WITH LOW-E GLASS

Considering that coloured/tinted glass already absorbs a certain amount of heat due to its colour and that low-e glass positioned on surface 3 or 4 also reflects heat, Multiver recommends to heat treat or temper coloured glass panes if they are to be combined with low-e glass.

Double-Glazed Insulated Glass Units

Coloured/tinted glass of 5 mm and 6 mm (1) + pyrolytic low-e (EPS) glass on surface 3 or 4 = coloured/tinted glass must be tempered or heat-strengthened.

Triple-Glazed Insulated Glass Units

Coloured/tinted glass of 5 mm and 6 mm (1) + pyrolytic low-e (EPS) glass on surface 3, 4, 5 or 6 = coloured/tinted glass as well as the middle glass pane must be tempered or heat-strengthened.



Campus Bell - Tinted and low-e glass



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LOW-E GLASS

Multiver has access (either in stock or otherwise) to a large quantity of various types of low-e glass.

The glass products most commonly used in residential applications are the following :

COMFORT SELECT 73 / EPS

Optimum hard-coated glass recommended on surface 3 and/or 5. This type of glass offers high solar heat gain and thermal insulation, which makes it the perfect choice for residential applications in our climatic conditions. By default, Multiver uses this low-e glass if no other low-e glass product was specified in your order.

COMFORT SELECT 63

Optimum soft-coated glass recommended on surface 3 and/or 5. This type of glass offers high solar heat gain and thermal insulation, which makes it the perfect choice for residential applications in our climatic conditions. Use this glass when replacing insulated glass units with Ti-PS glass since the colour is the same, only the tint is slightly lighter, which is not noticeable unless old and new units are directly side by side.

COMFORT SELECT 40

Optimum soft-coated glass recommended on surface 2. This type of glass reflects heat, which makes it the perfect choice for situations where heat is an issue (side of a building facing a lake, patio doors or oversized windows with southern exposure, etc.). Use this glass when replacing insulated glass units with Ti-AC 40 glass since the colour is similar, only the tint is slightly darker, which is not noticeable unless old and new units are directly side by side.

SNX 62/27 TRIPLE SILVER

High-performance glass with quite a pronounced greenish tint. Since this product is slightly more expensive, it should only be used when requested by your client. SNX 62/27 glass is commercial-grade low-e glass.

Considering that Multiver has a wide variety of low-e glass products in stock and that we can obtain others from our suppliers, do not hesitate to contact our sales department if you are looking for a specific product. It should also be noted that the colour evaluation of products is a subjective evaluation made by our experts.



Heat-Treated AND LAMINATED GLASS

TEMPERED GLASS

Available in 3,3, 4, 5, 6, 8, 10, 12, 15 and 19 mm thicknesses. Often referred to as safety glass. Following the tempering process, the glass surface becomes very hard, which makes it stronger. In the event of breakage, tempered glass will break with a high energy release of very small pieces, which is why it is considered a safe product.

Minimum size (regardless of thickness) : 4 inches x 9 15/16 inches (100 mm x 250 mm).

Maximum size with 3.3 mm thickness : 36 inches x 80 inches (914 mm x 2,032 mm).

Maximum size with 4 mm thickness : 48 inches x 96 inches (1.219 mm x 2.438 mm).

Maximum size with 5 mm thickness : 74 inches x 128 inches* (1,879 mm x 3,251 mm).

Maximum size with 6 mm thickness or more : 86 inches X 144 inches (2.184 mm X 3.657 mm).

*Certain glass sheets are less than 3.657 mm in length.

HEAT-STRENGTHENED GLASS

Same size restrictions and available thicknesses as tempered glass. Heat-strengthened glass is mainly used in glass units designed for high-rises. This type of glass is therefore very unlikely to be found in residential applications.

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LAMINATED GLASS

Available in a variety of combinations, laminated glass consists of a PVB interlayer sandwiched between two glass sheets and permanently bonded together under pressure. Benefits associated with laminated glass are as follows : it is intrusion resistant and sound insulating, and provides protection from UV radiation.

Laminated glass is considered as anti-intrusion glass because even if the glass were to break, the PVB interlayer would hold the broken pieces in place. Certain combinations can also be considered bullet-resistant. Hurricane-resistant glass is laminated glass. In this case, make sure to choose the right type and request to have the stamp indicating that the glass complies with applicable standards.



Quebec scientific complex - Laminated glass



Patterned GLASS

Multiver has access (either in stock or otherwise) to a large quantity of various types of patterned glass.

DEFAULT POSITION

Multiver always positions patterned glass on the outer pane of insulated glass units, unless the client requests that it be positioned otherwise. If the unit includes grilles, positions are reversed (grilles are architectural decorations and must therefore be clearly visible from the exterior of the building).

The patterned glass products most commonly used in residential applications are the following :

PINHEAD MOROCCO (3 MM, 5 MM)

Most commonly used patterned glass. When people think of frosted glass, this is often the first one that comes to mind. Only the 5 mm thick pinhead morocco glass can be tempered.



GLUE CHIP (3 MM, 5 MM)

When placing an order for this type of glass, please make sure to request the same thickness for all adjacent units,

since the pattern may vary according to glass thickness.



ACID-ETCHED (3 MM, 4 MM AND 6 MM)

Frosted glass most commonly used in the window and door industry. Please note that a distinction must be made between acid-etched glass and sandblasted glass, which has a less “even” finish.



Tip : If you offer a door system with a decorative unit in the door slab and your client thinks that ordering sidelights and transoms from the same collection is too expensive, suggest a more affordable patterned glass that would complement the decorative unit of the door.

Considering that Multiver has a large selection of patterned glass products in stock and that we can obtain others from our suppliers, do not hesitate to contact our sales department if you are looking for a specific product.



Multiver SPACERS

Multiver uses various spacers in the manufacture of its insulated glass units. For further information, consult the Spacers document available on Multiver's Web site. We always use two sealants except in rare circumstances where technical requirements and/or the client's specifications require otherwise. Here is a brief description of each spacer :

SUPER SPACER PREMIUM (BLACK)

Warm edge non-conductive spacer. Silicone memory foam extrusion with integrally incorporated desiccant and moisture barrier. Spacer offering the best thermal insulation. Technical requirement : certain shapes, sizes and grilles are not available with this product.

TECHNOFORM (BLACK, BRONZE, CHAMPAGNE, GREY AND WHITE)

Warm edge non-conductive spacer. Hybrid spacer with a polypropylene structure and stainless steel moisture barrier. Bronze and champagne spacers blend nicely with wood products.

INTERCEPT (BLACK STAINLESS STEEL)

Entry level spacer. Even though this spacer is made of stainless steel, Intercept spacers still have good performance, in particular, because of the two sealants and its design.

ALUMINUM BOX SPACER

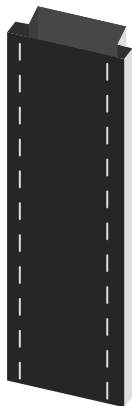
Entry level spacer. Perfect spacer for economic units without low-e glass because it is conductive.

If one of your clients has problems with internal condensation, this phenomenon can be reduced by using a non-conductive spacer since condensation is always the result of a relative humidity problem. For other solutions, consult the Internal Condensation section below.

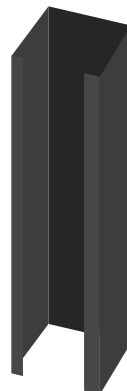
Multiver also manufactures insulated glass units with stainless steel box spacers available in various colours. The use of such spacers does not provide any benefits to residential projects.



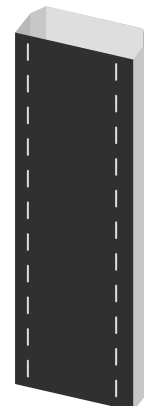
SUPER SPACER



TECHNOFORM



INTERCEPT



BOX SPACER



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SHAPES AND TEMPLATES

Fenestration products give great architectural character to buildings. Your products are constantly evolving to meet your clients' demand, and there is currently a growing demand for architectural shapes. Here are some helpful tips on ordering the units that are at the heart of such products.

The Additional Charges for Shapes section in our price list is your best reference

as it specifies the name of the various shapes as well as the dimensions you need to indicate when placing your order. We often receive templates for shapes that we already offer. It is important to remember that the processing of templates is subject to additional charges and may result in longer production times. We therefore recommend that you consult our price list to save money and speed up your order.

In the event that Autocad cannot be used, please follow the instructions listed below when sending us a template :

- ▶ Request a return # from our logistics department, even if you are the one sending the templates;
- ▶ Place an order with our sales department and indicate your return #;

- ▶ Prepare the templates for shipping by enclosing a copy of your order and return form.

To ensure high quality products, we would like to ask you to :

- ▶ Not draw templates with a lead pencil (always use felt-tip markers);
- ▶ Create templates in one single piece (no joints);
- ▶ Not use any materials that do not regain their shape after being distorted (e.g. masonite, thin plywoods);
- ▶ Avoid folding templates as much as possible;
- ▶ Use plain and clean materials;
- ▶ Ensure that all templates represent the outer shape of the insulated unit;
- ▶ Ensure that all templates correspond to the actual size.

There is no need to cut the templates; the outline, traced with a marker pen, is sufficient. Multiver reserves the right to refuse to process certain templates.





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OVERSIZED UNITS

With the ever more demanding requirements of architects and consumers, there is a growing demand for oversized units. The following is a brief overview of our restrictions applicable to oversized units.

Maximum size for non-tempered glass		Required glass thickness
M ²	PI ²	
1.4	15	3 mm
2.75	29.6	4 mm
3.70	39.83	5 mm
4.65	50	6 mm

Units larger than 50 ft² (4.65 m²) are also available, but such units must be tempered.

In the case of oversized units that will be exposed to wind, using tempered glass will make the unit stronger and prevent the glass panes from touching in the centre. Under certain circumstances, the use of laminated and tempered glass may even be necessary. Upon request, Multiver can conduct wind pressure tests to determine whether the glass thickness used is adequate.

It is important to consider available glass sheet sizes :

- ▶ Clear glass (not low-e) 102 inches x 144 inches (120 inches x 168 inches, longer production time);
- ▶ Low-e glass 96 inches x 130 inches for the majority. In some rare cases, 102 inches x 144 inches;
- ▶ Coloured glass 96 inches x 130 inches;
- ▶ Patterned glass, always verify, but glass sheets are usually small and the orientation of the pattern must be taken into account.



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INTERNAL CONDENSATION

Air moisture condenses when it comes into contact with cold surfaces. This phenomenon generally forms around the glass surface of the insulated glass unit because the spacer acts as a thermal bridge between the outside cold and the inner glass pane. The first thing to check is the relative humidity. Here is a reference table :

Maximum moisture content before condensation		
Outdoor temperature	Standard IG unit	High performance IG unit
0 °C	50 %	63 %
-10 °C	38 %	50 %
-20 °C	26 %	40 %
-30 °C	18 %	30 %
-40 °C	12 %	23 %

To reduce condensation :

- ▶ Lower the moisture content in the room;
- ▶ Keep window treatments away from the windows to allow for good air flow (there should be a minimum distance of 100 mm between the frame and window treatment);
- ▶ Bring a hot air flow closer to the glass surface using a heating source (install a new heating source and/or move any furniture blocking the window);
- ▶ Use an insulated unit with better insulation (argon gas, warm edge spacer, low-e glass and/or triple-glazed insulated glass unit);
- ▶ Reinstall the window so that the insulated glass unit is closer to the room.

*In the case of replacement windows and high moisture content, internal condensation is a sign that the new windows are working properly. However, it is important to pay close attention to ensure that certain problems, such as mould growth, do not occur.

EXTERNAL CONDENSATION (FROST IN WINTER)

The occurrence of this phenomenon is good news as it shows that the insulated glass unit is working properly in terms of thermal insulation. If the insulated unit transmitted heat from the room out of the building, there would be very little external condensation.

External condensation should only occur under rare circumstances where the following conditions are met : clear night sky, still air, high relative humidity and insulated glazing. External condensation should only form early in the morning and then disappear with sun and/or wind exposure. If there is often external condensation on your windows, move any shrubs or plants away from the windows as they release moisture.



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NOISE INSULATION

Certain environments can be particularly noisy. Improving the sound insulation of insulated glass units can help reduce noise problems. In general, using laminated glass is the best solution (laminated glass not only improves sound insulation, it also provides protection from UV radiation and is considered as intrusion resistant glass, depending on its composition). Triple-glazed insulated glass units also have certain soundproofing properties according to their composition.

Double-glazed unit						
Glass Thickness	Airspace	Glass Thickness	Total Unit Thickness (approx.)	STC*		
3 mm	12 mm	3 mm	18 mm (11/16 in)	31*		
6 mm	12 mm	6 mm	24 mm (15/16 in)	35*		
6 mm laminate (2x3 mm+pvb 0.030 in)	12 mm	6 mm	24 mm (15/16 in)	39*		
6 mm laminate (2x3 mm+pvb 0.060 in)	12 mm	6 mm	24 mm (15/16 in)	41*		
6 mm laminate (2x3 mm+pvb 0.030 in)	12 mm	6 mm laminate (2x3 mm+pvb 0.030 in)	24 mm (15/16 in)	42*		
6 mm laminate (2x3 mm+pvb 0.060 in)	19 mm	6 mm laminate (2x3 mm+pvb 0.060 in)	31 mm (1 1/4 in)	44*		
Triple-glazed unit						
Glass Thickness	Airspace	Glass Thickness	Airspace	Glass Thickness	Unit finish	STC*
6 mm	12 mm	6 mm	12 mm	6 mm	42 mm (1 5/8 in)	39*
6 mm laminate (2x3 mm+pvb 0.030 in)	12 mm	6 mm laminated	12 mm	6 mm laminate (2x3 mm+pvb 0.030 in)	42 mm (1 5/8 in)	44*
Examples of Glass Partitions						
Glass partition with 92 mm metal posts and a 12 mm gypsum board on each side					-	36*
Glass partition with 100 mm bricks assembled using mortar					-	45*
Glass partition with lightweight concrete blocks of 152 mm and two coats of paint on each side					-	46*

*approximate data (STC performance needs to be assessed in laboratory)

Laminated glass should be positioned on the inner surface considering that its sound insulating properties can be affected by the cold. However, since laminated low-e glass is not recommended, it may be advisable to position a laminated glass on the outer surface and a low-e glass on the inner surface.

Also, using a spacer like those from the Super Spacer series can slightly improve the sound insulation of insulated glass units.

It is important to keep in mind that windows are not necessarily the weak point of your construction in terms of sound insulation and that if a window is not properly installed, the performance of the insulated glass unit will be seriously compromised.



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 herein is the sole responsibility of the users. Multiver assumes no responsibility for the use of its products.