MULTIVER
GLASS

PRACTICAL ADVICE ON WRITING ARCHITECTURAL SPECIFICATIONS

DATA SHEET / Quebec

Version 2.0

MULTIVER Ltd
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MULTIVER
Cutting edge of the glass industry

Working with **MULTIVER'S EXPERIENCE**

With more than fifty years' experience in the glass industry, we believe that sharing our knowledge and know-how in the industry can benefit your company.

We have produced this document **to facilitate the writing of architectural specifications,** in particular with regard to glazing. This document will help you avoid making errors that could have an impact on the project. This document provides general information, and certain changes can be made depending on the complexity of projects. A number of **technical documents are also available on Multiver's Web site.**

IMPROVING THERMAL RESISTANCE (R-Value)

- Opt for **a low emissivity (low-e) glass** on surface 2 or 3, an inert gas such as **argon or krypton** as well as a **Technoform-M spacer** with low thermal conductivity, available in five colours : **black, white, grey, bronze and champagne.**

- **Reduce heat gain (shading coefficient, heat gain coefficient, relative heat gain).** Low-e glass must be positioned on surface 2 in a double-glazed insulated glass unit and on **surface 2 and/or 4** in a triple-glazed insulated glass unit (to achieve optimum performance).
  In the case of **large glass surfaces,** it is recommended to position low-e glass on surface 2 (also applies to the residential sector) to **limit air conditioning costs.**

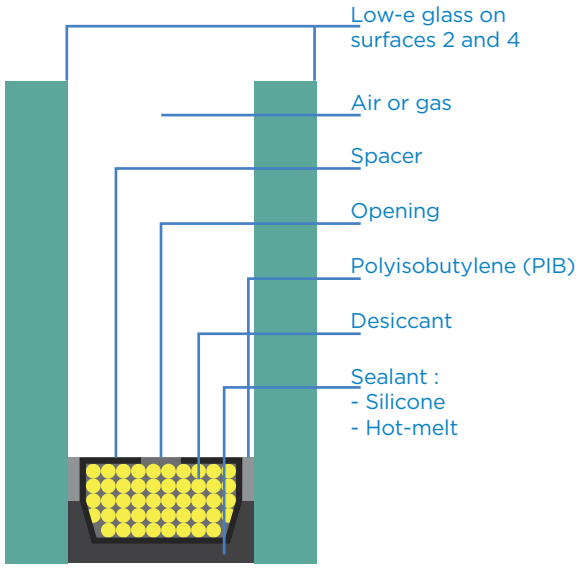
- **Maximize heat gain (shading coefficient, heat gain coefficient, relative heat gain).** Low-e glass must be positioned on **surface 3** in a double-glazed insulated glass unit and on **surface 3 and/or 5** in a triple-glazed insulated glass unit (to achieve optimum performance).

- Maximizing heat gain is more common in the **residential sector to lower heating costs.**

- **Some low-e glass products cannot be positioned on surfaces 3 and 5.** For further information, consult a Multiver specialist.

***** NEW *****

It is now possible to combine **two low-e glass panes in the same double-glazed unit for this type of assembly.** Low-e coatings are applied to **surfaces 2 and 4.** Such assembly is a less expensive solution than triple-glazed insulated glass units to improve thermal resistance. Please contact us as it is recommended to use **pyrolytic** coatings on surface 4.



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SEALANT FOR INSULATED GLASS UNITS

In your specifications, indicate that the first sealant is **polyisobutylene (PIB)** and that the second sealant is **silicone (black or grey), for most applications.**

In the residential sector, **hot-melt** (available in black) is the perfect product because it is very effective against water vapour. This product also stands out because it hardens very quickly (in approximately 30 minutes), which allows to quickly produce vacuum insulated units and deliver them to the customers without having to wait several hours for the sealant to be hard.

Window and curtain wall manufacturers **must use sealants that are compatible with our sealants.** Consult the documents on sealant compatibility available on Multiver's Web site. You can make reference to these documents in the architectural specifications to reduce the risk of incompatibility.

SETTING BLOCKS

Regarding their compatibility, **it must be indicated that setting blocks have to be silicone-based in cases where the insulated glass units were assembled with a silicone sealant.** Failure to comply with this instruction could result in the voiding of the Multiver warranty.

SPACERS

Considering its gas retention, low conductivity and affordability, we generally recommend using a Technoform-M warm edge spacer of the colour of your choice.

Spacers play a major role in reducing heat loss as well as condensation on insulated glass units. Multiver offers a large selection of spacers in a variety of thicknesses. **For further information, consult the documents on spacers available on our Web site.**

LOW-E GLASS

To ensure that you select the right low-e glass, consult the **Comparative Table with Low Emissivity Glass** document available on Multiver's Web site. The document contains performance data on most low-e products available on the market.

REFLECTIVE GLASS

Reflective glass is **recommended on surface 2** of insulated glass units because on surfaces 1 and 4, there is a short or long-term risk of oxidation of the reflective oxide layers deposited onto the glass.

SPANDREL GLASS

Ceramic frits or OPACI-COAT 300® coatings must be applied to surface 2 of monolithic glass and on **surface 4 of insulated glass units with spandrel glass.**

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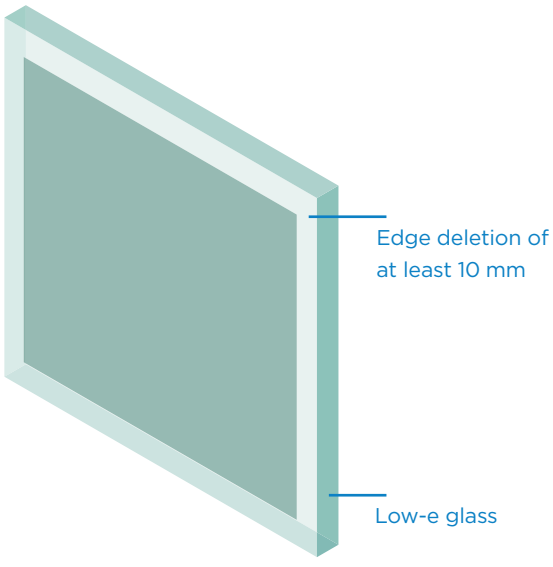
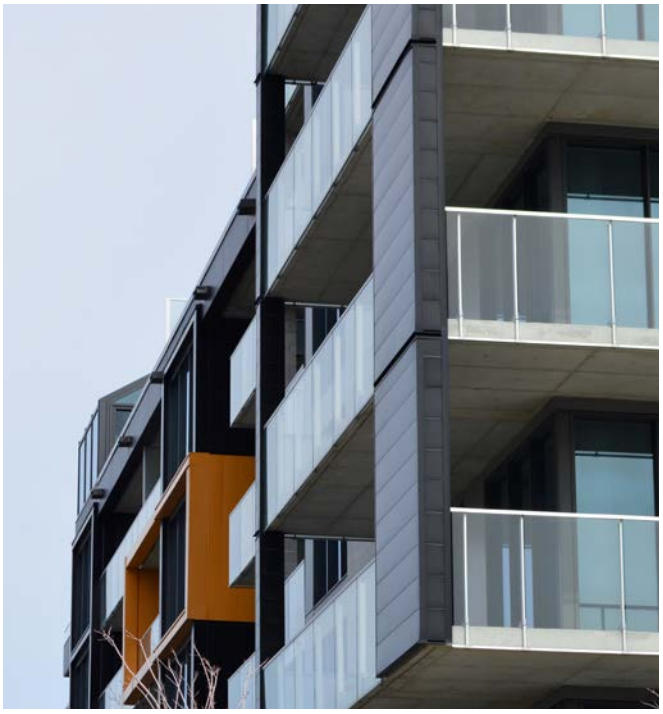
Our suppliers advise against applying ceramic frits or OPACI-COAT 300® coatings to surfaces 1 and 3.

EDGE DELETION

Regarding the manufacture of insulated units with soft coat low-e glass, **Multiver strongly recommends a minimum edge deletion of 10 mm on the glass surface to which the metallic oxide layers were applied.** Edge deletion involves removing from the edge metallic oxide layers that could come into contact with the sealant. Edge deletion has a number of benefits : it allows the sealant to better adhere directly to the glass, rather than the metallic oxides; it increases the lifespan of insulated units; and it reduces the risk of contamination and corrosion. **Multiver encourages specialists in architecture to mention edge deletion in the architectural specifications.**





INSULATED GLASS UNITS

Specify the thickness, type of spacer, positions of the glass panes and whether shaping is required. Information must be clear and concise. Here is a concrete example :

OUTER GLASS PANE : 6 mm thick low-e glass, **Econover Select 40 on surface 2, tempered.**
SPACER : Black **Technoform-M** spacer with low thermal conductivity, 13.39 mm thick.
INNER GLASS PANE : 5 mm thick, grey tempered glass laminated to a **1.5 mm thick PVB interlayer** laminated with 5 mm thick, clear tempered glass.

Insulated units larger than 110 inches (2.794 mm) or with 80 inches (2.032 mm) or more in length and width have to be wrapped in crates. Additional costs are to be expected.

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SILK-SCREENED AND ETCHED GLASS

Silk screen or glass etching (image or pattern sandblasted onto glass) **are recommended on surface 2** of monolithic glass and on **surface 2 and/or 4** of insulated glass units.

Certain conditions apply, please contact us for further information.

TEMPERED GLASS

Note that the products listed below **should usually be tempered :**

Glass panes and insulated glass units larger than 55 square feet (approximately 5.11 square metres); highly efficient low-e glass with a strong tint; most tinted and reflective glass products; ceramic frit and OPACI-COAT 300® spandrel glass; silk-screened glass products; balustrade glass; door glass or glass that could be mistaken for a door; insulated glass units with glass extending beyond the spacer frame.

Maximum size of heat treatment furnaces : 96 inches X 162 inches (2.438 mm X 4.114 mm)

LAMINATED GLASS

Note that the products listed below **should usually be laminated :**
Safety and security glass that can withstand attacks, bullets and hurricanes; balustrades; sound-insulating glass, coloured glass other than our selection of tinted glass (e.g. the Montreal Convention Centre), automotive windshields.

Maximum size of automatic laminating line : 84 inches X 144 inches (2.134 mm X 3.657 mm).

INSULATED GLASS UNITS WITH PRIVAVISION INTEGRAL BLINDS

Privavision integral blinds can be either magnet operated or electric. Regarding magnet operated (manual) blinds, they can be opened or closed, and the raise/lower functions are optional. Such blinds are controlled using a small magnetic handle.

As for electric blinds, they can be opened, closed, raised and lowered in the insulated glass unit. Such blinds can be operated in various ways with a remote control or switches (automatic or radio frequency/infrared remote control).

For both magnet operated and electric blinds, **slats and spacers are available in various colours.** Various glass thicknesses can be used and **combined with most low-e, tinted and reflective glass products available on the market** to achieve the desired performance.

For further information, contact us or consult the *Privavision Integral Blinds section.*

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SAMPLE REQUEST

For a sample request, please fill out the Sample Request form available on Multiver's Web site and then send it to us. We will process your request in a timely manner (certain conditions apply).

SHAPING

Using state-of-the-art computer numerical control (CNC) machines, Multiver will assist you in your creations, however complex they are. When it come to glass with a non-standard shape, holes, notches or edgework, contact a specialist so that he may assist you in choosing from our wide range of products, or consult the Examples of Glass Shaping document available on our Web site.

LEED CANADA AND **MULTIVER**

Multiver is proud to be involved in the continued growth of the green building and sustainable development movement. Our large selection of products can help achieve **LEED**® certification for your projects.

Please contact us and our specialists will assist you with your **LEED**® certification.

Campus Bell

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VIRTUALLY ENDLESS POSSIBILITIES WITH MULTIVER

The following is a list of some of the specialty products offered by Multiver. For assistance with your selection, contact a Multiver specialist.

- Low-iron glass (Optiwhite™, Ultrawhite™, Krystal Klear)
- Ceramic frit and OPACI-COAT 30® spandrel glass
- Laminated glass that can withstand hurricanes, attacks and bullets
- Insulated glass units with Privavision integral blinds
- Laminated glass with an acoustic interlayer (Saflex® Q Series, TROSIFOL® SC+, Pilkington Optiphon™)
- Laminated safety glass (DuPont™ Sentry Glas®)
- Acid-etched or sandblasted glass
- Silk-screened and etched glass
- Coloured laminated glass (Saflex®, Vanceva®, TROSIFOL® COLOUR)
- On-site delivery or delivery to the factory
- Technical assistance with projects (physical and theoretical tests)
- Research and development of new products
- Curved glass
- Laminated glass with maximum UV transmittance (TROSIFOL® UV +)
- Patterned glass
- On-site technical expertise
- Thick glass for glass partitions
- Smart glass
- Tinted and reflective glass
- Assistance with LEED® projects
- Spider wall systems
- OptiView™ anti-reflective glass
- SpaciaTM vacuum insulated glazing
- Performance data
- Low-e glass
- Activ™ self-cleaning glass
- Decorative glass
- Fire-resistant and fire protection glass
- Tempered glass
- Laminated glass
- Heat Soak tested heat-treated glass
- Oversized glass
- Digital printing of ceramic ink on glass

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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.

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