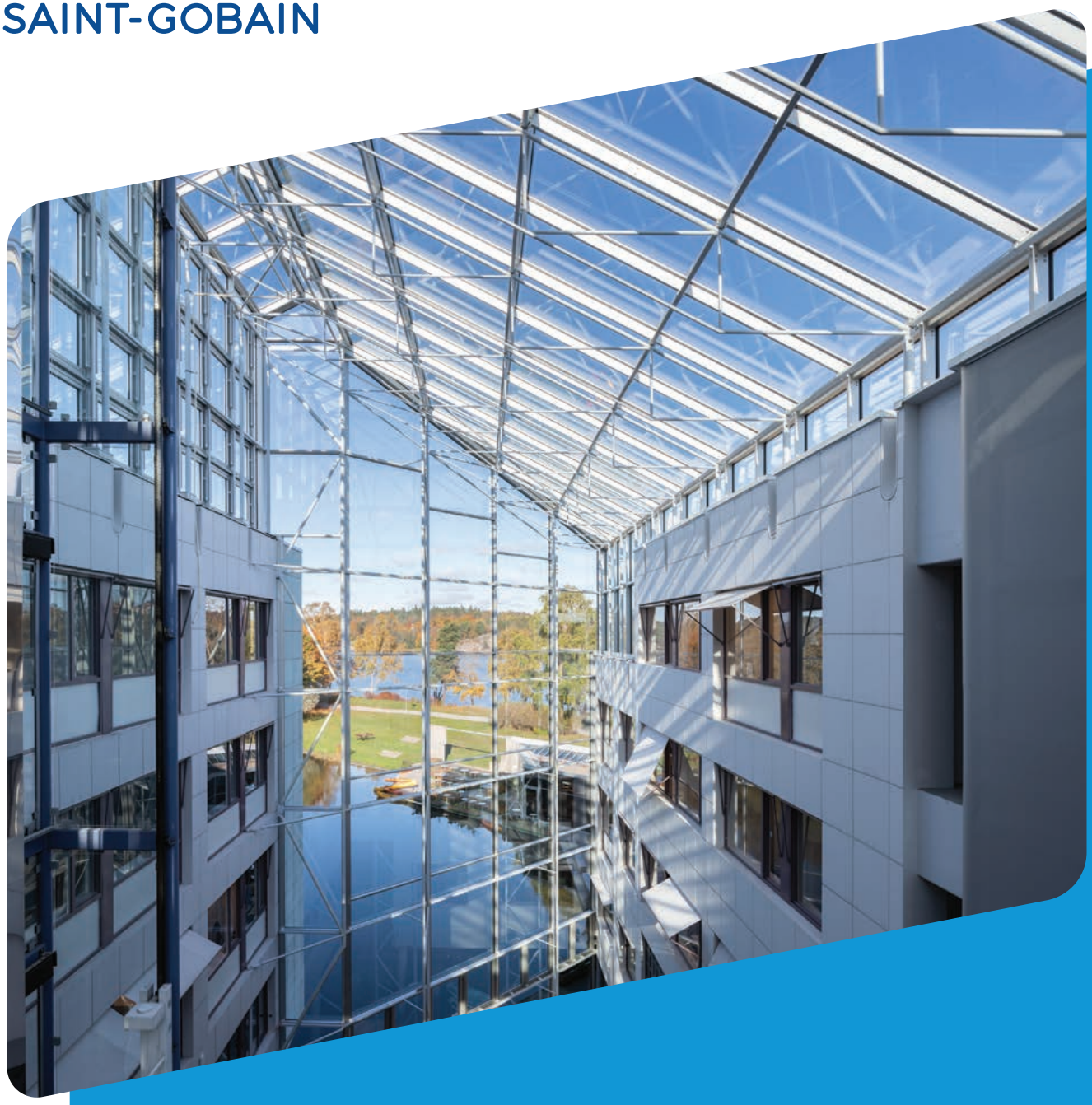
SAINT-GOBAIN



ORAÉ®
LOW-CARBON GLASS

SAINT-GOBAIN GLASS

ORAÉ

THE WORLD'S FIRST LOW-CARBON GLASS WITH VERIFIED EPD

ORAÉ® has been developed with a sustainability first perspective, reducing carbon emissionsand helping to advance the circular economy without compromising on aesthetics or technical standards.

Achieving a remarkably low carbon footprint of 6.64 kg of CO_2 eq/m^2 for a 4mm glass, ORAE® owes its eco-friendly credentials to a robust combination of factors. Notably, it incorporates an impressive 64% recycled content alongside the utilisation of renewable electricity sources.

WHAT YOU NEED TO KNOW

- COOL-LITE® XTREME ORAÉ® is available in standard sizes and thicknesses (4, 6, 8 and 10mm).
- The COOL-LITE® XTREME ORAÉ® can be assembled in double or triple glazing.
- COOL-LITE® XTREME ORAÉ® delivers the same high performance and quality as COOL-LITE® XTREME PLANICLEAR® but with a lower carbon footprint.
- The COOL-LITE® XTREME ORAÉ® is fully EPD verified.

PRODUCT PERFORMANCE

ORAÉ® offers the same level of performance and quality as PLANICLEAR®, but it has a significantly reduced carbon footprint.

As verified by its Environmental Product Declaration (EPD), ORAÉ® benefits from a 6.64 kg CO_2 eq/m^2 carbon footprint for a 4mm substrate. This represents an impressive 42% reduction when compared to PLANICLEAR®.

	Light Transmission (LT) %	Solar Factor (g-value)[1] %	Outside Reflection (LRe)[1] %	Inside Reflection (LR)[1] %	Carbon Footprint (GWP) A1-A3[2] [kg CO_2 eq/m]	Carbon Footprint (GWP) A1-C[3] [kg CO_2 eq/m]	Carbon Reduction vs PLANICLEAR®[3] %
ORAÉ® 4mm	91	88	8	8	5.88	6.64	-42
PLANICLEAR® 4mm	91	88	8	8	10.90	11.50	

1 *According to EN410*
2 *Global Warming Potential (GWP) A1-A3 Stages (Cradle to Gate); detailed environmental data are documented in the available Environmental Product Declarations (EPD) of PLANICLEAR®*
3 *EPD can be verified by an external third party. Global Warming Potential (GWP) A-C Stages (Cradle to Grave); detailed environmental data are documented in the available Environmental Product Declarations (EPD) of PLANICLEAR® EPD can be verified by an external third party.*

APPLICATIONS

ORAÉ® is versatile by design and suitable for both new construction and renovation projects, across both residential or non-residential sectors. It serves as a direct replacement for standard clear glass of equivalent thickness, regardless of the application:

- **Building envelope: Ideal for use in insulating glazing for windows, facade elements, or glass roofs.**
- **Other external or internal applications (e.g., balustrades, doors, partitions): Available upon request to meet your specific project needs.**

AESTHETICS

ORAÉ® delivers the same visual appeal and properties as our well-established PLANICLEAR® glass.

RANGE

ORAÉ® is offered as monolithic clear float glass, available in thicknesses of 3, 4, 6, 8, and 10 mm.

It can be incorporated into safety glass solutions such as STADIP® or STADIP® SILENCE for enhanced safety or reinforced acoustic insulation.

Additionally, it seamlessly integrates with our highly selective solar control product families, including COOL-LITE® XTREME and COOL-LITE® SKN.

PRODUCT PERFORMANCE FAÇADES

Designed specifically for integration into the glazed sections of architectural façades such as curtain walls, double skin façades, and skylights, COOL-LITE® ORAÉ® has been optimally designed to meet the increasingly stringent sustainability standards within the construction sector, providing uncompromising performance, both technically and aesthetically.

COOL-LITE® ORAÉ® achieves a successful balance between embodied and operational carbon levels:

- **The glass substrate ORAÉ®, boasts a low carbon footprint validated by an Environmental Product Declaration (EPD).**
- **The exceptional energy efficiency provided by the COOL-LITE® XTREME and COOL-LITE® SKN coatings. These coatings significantly mitigate carbon emissions associated with energy consumption during building operation. Their superior capabilities in daylight management, solar control, and thermal insulation contribute to substantial reductions in energy usage.**

Based on its verified Environmental Product Declaration (EPD), coated ORAÉ® demonstrates an impressively low carbon footprint of just 10.71 kg CO_2 eq./m² (for a 6mm substrate). This figure represents a substantial 43% reduction compared to our European standard product coated PLANICLEAR®.

When integrated into an insulated glazing unit, this reduction typically ranges between 30% to 40%.

	Carbon Footprint (GWP) A1-A3[2] [kg CO_2 eq/m]	Carbon Footprint (GWP) A1-C[3] [kg CO_2 eq/m]	Carbon Reduction vs PLANICLEAR®[3] %
COATED ORAÉ® 6mm	91	88	8
COATED PLANICLEAR® 6mm	91	88	8

Standard build up double glazing unit 6/16/4mm. One pane coated 90% Argon	Carbon Footprint (GWP)[2, 4] [kg CO_2 eq/m]	Carbon Reduction vs PLANICLEAR®[2, 4] %
COATED ORAÉ® 6mm (face #2 or #3)	24	-39%
COATED PLANICLEAR® 6mm	28	-36%

Standard build up triple glazing unit 6/12/4/12/4mm. One pane coated 90% Argon		
COATED ORAÉ® 6mm (face #2 or #3)	36	-38%
COATED PLANICLEAR® 6mm	39	-35%

2 Global Warming Potential (GWP A1-A3 Stages) values with PLANICLEAR® and ORAÉ® are calculations made with Calumen® for each composition of insulated glazing unit (IGU) on the basis of the standard EN 15804+A2. Detailed environmental data are documented in the available Environmental Product Declarations (EPD) of PLANICLEAR® and ORAÉ®. Only complete EPD can be verified by an external third party.

4 All panes of the IGU with the same substrate; first pane respectively annealed or tempered (II) with the same glass compositions; counter panes always annealed.

LOW CARBON MANUFACTURING OF FLAT GLASS AT SAINT-GOBAIN GLASS

1. GLAZING RECOVERY

Recycling glazing at the end of its life has two major advantages: reducing the carbon footprint of glass and preserving exhaustible resources such as sand.

Today, one of the challenges is to structure glazing recovery channels to recycle flat glass in a closed loop.

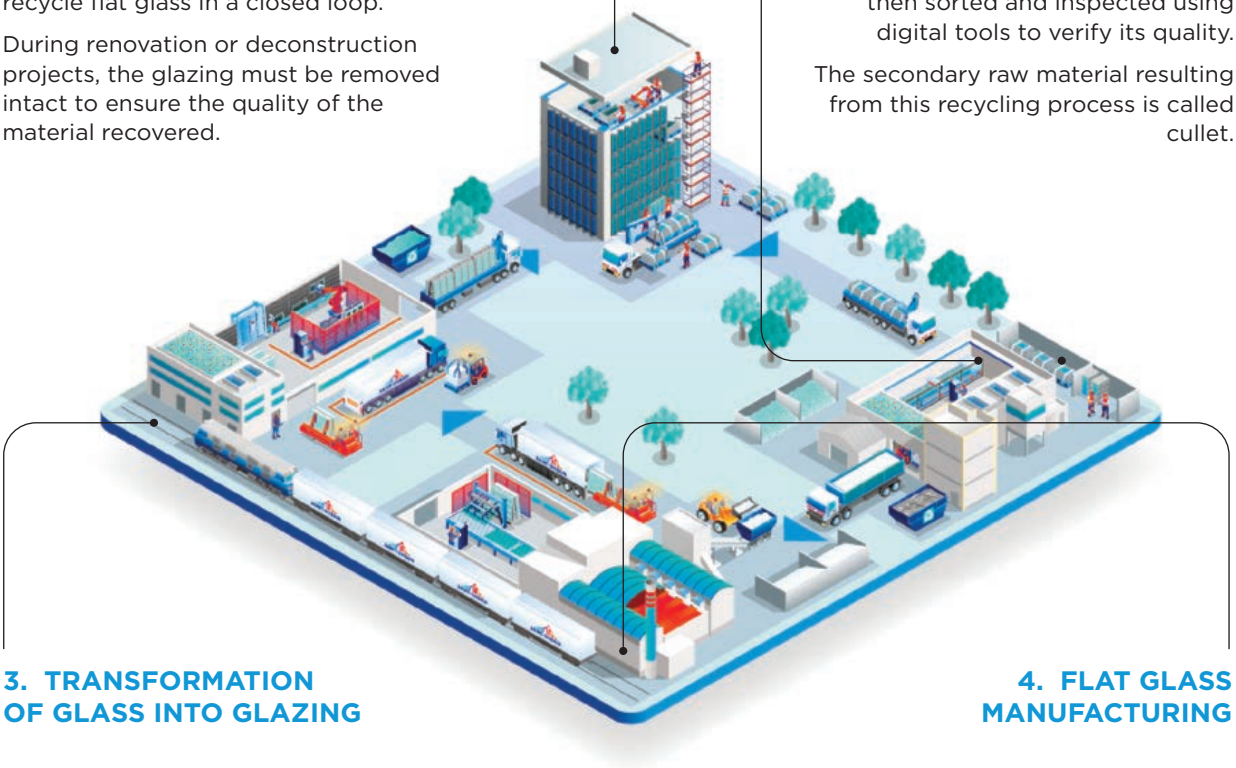
During renovation or deconstruction projects, the glazing must be removed intact to ensure the quality of the material recovered.

2. CULLET PRODUCTION

Once the glazing has been removed, it is transported to a dismantling site. The different parts of the windows are separated and the glass is dismantled.

The recovered glass is crushed and then sorted and inspected using digital tools to verify its quality.

The secondary raw material resulting from this recycling process is called cullet.



3. TRANSFORMATION OF GLASS INTO GLAZING

Once the flat glass is manufactured, it is transported in an inloader truck to the processing site, where it becomes a glazing unit ready for installation.

Digital tools optimize the flow between sites, reducing transport-related emissions. On the way back to the plant, the truck can be loaded with cullet from the processing scrap.

To reduce road traffic between manufacturing sites, the use of multimodal transport (train and road) is growing rapidly.

4. FLAT GLASS MANUFACTURING

The cullet used to manufacture glass does not emit CO_2 during its melting, which also requires less energy than for virgin raw materials.

The use of low-carbon energy sources, such as biogas and green electricity, further reduces emissions from glass production.

Other industrial innovations also improve energy consumption in the plant. For example, the heat generated by the furnace can be used as energy in other parts of the production line.

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