

On the safe side.

Marine glazing solutions and specification



vetrotech
SAINT-GOBAIN

Our Global Presence

Vetrotech Saint-Gobain International AG, a member of the Saint-Gobain Group, specializes in the development, production, and distribution of **marine safety glass**—including fire-resistant, pressure-resistant, and heatable options—as well as **fire-resistant** and **high-security glazing solutions for buildings**.

Its products are manufactured at **Vetrotech production sites** across Europe and Asia, as well as in collaboration with other Saint-Gobain glass partners.



Marine Segment Applications

Our glazing solutions are designed for a **wide variety of marine vessels**, offering both exterior and interior applications that deliver **exceptional performance, durability, and safety** — even in the most demanding maritime environments.



SKYLIGHT
Harmony of the Seas, USA



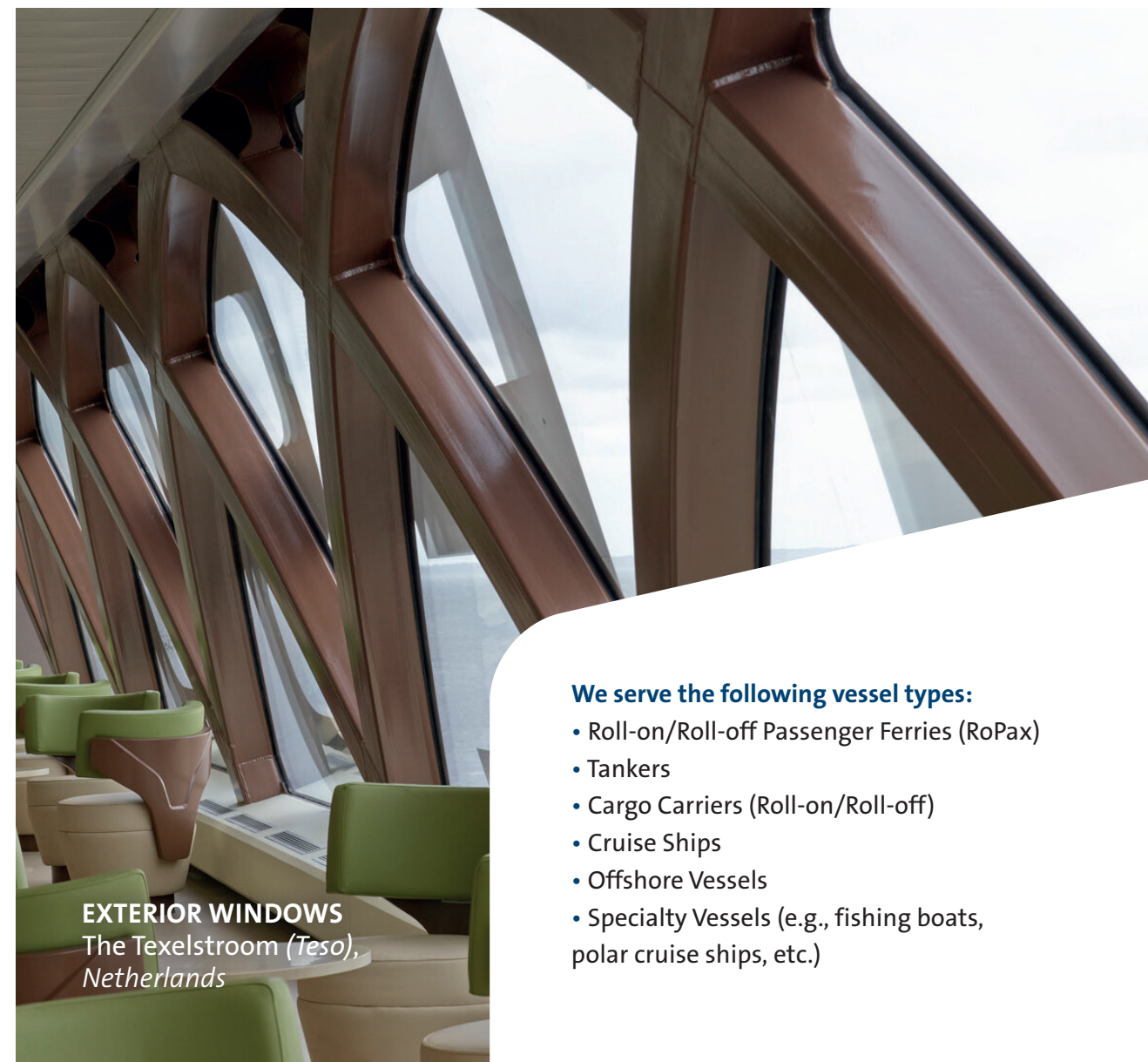
INTERIOR WINDOWS / ATRIUM
Harmony of the Seas
USA



**FIRE-RATED WINDOWS
& SIDE SCUTTLES**
Bornholms Trafikken,
Germany



WHEELHOUSE WINDSHIELD
Delos, Germany



EXTERIOR WINDOWS
The Texelstroom (*Teso*),
Netherlands

We serve the following vessel types:

- Roll-on/Roll-off Passenger Ferries (RoPax)
- Tankers
- Cargo Carriers (Roll-on/Roll-off)
- Cruise Ships
- Offshore Vessels
- Specialty Vessels (e.g., fishing boats, polar cruise ships, etc.)

Core Product Range & Key Performances

We offer a diverse range of high-performance products designed to meet the unique challenges of marine and industrial applications :

FIRE-RATED GLASS

PYROSWISS® is a thin, elegant, fire-resistant glass that has superior mechanical integrity and antibreakage properties compared with ordinary toughened glass.

CONTRAFLAM® meets the highest fire protection standards by providing glass integrity and thermal insulation for up to 120 minutes.

HEATED GLASS

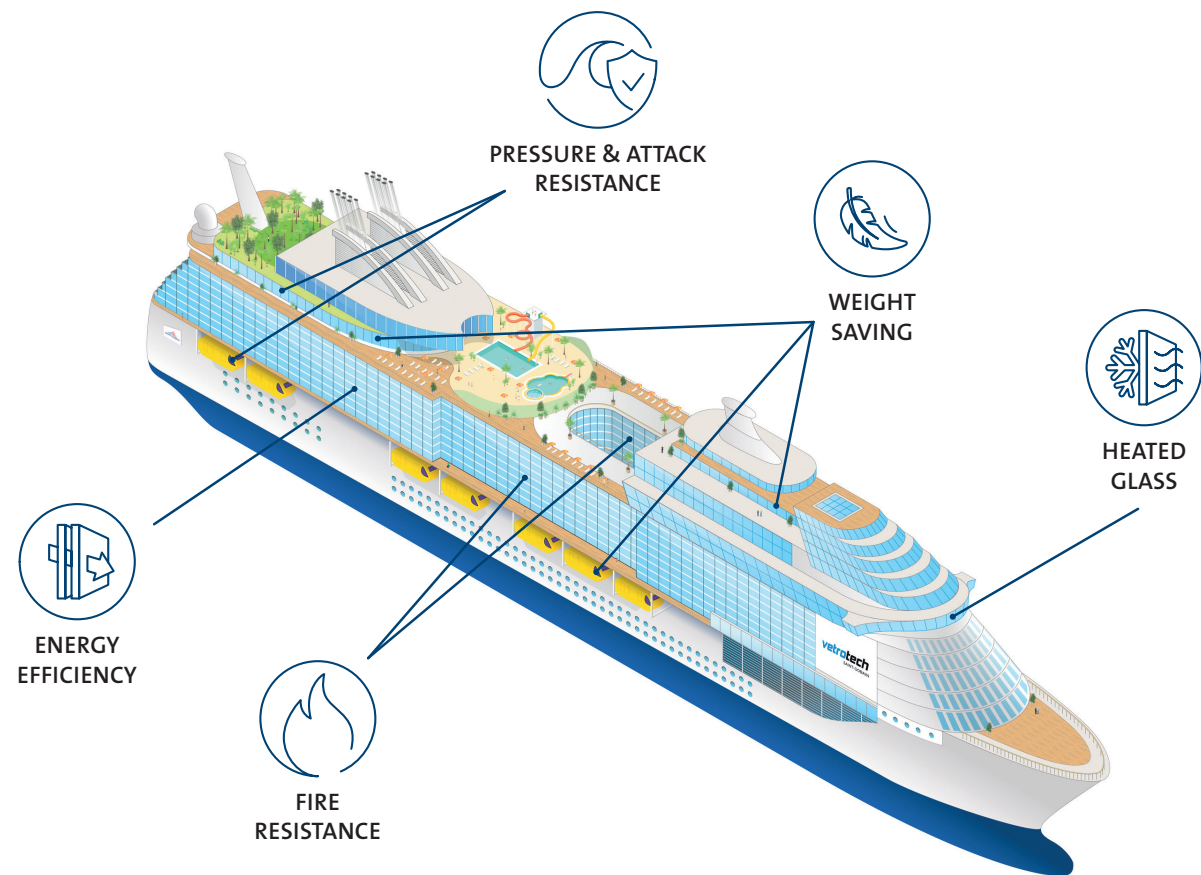
THERMOVIT® Marine is a special laminated glass which is electrically heated using almost invisible

conductive wires. This product is designed to keep windows within the marine environment free from frost, snow, vapor and condensation.

PRESSURE-RESISTANT GLASS

Marine glass windows must endure extreme weather and pressure conditions while ensuring both safety and visibility. Our pressure-resistant glass solutions include ISO 614-compliant glass, available in **monolithic, laminated, STADIP® Marine**, and **high-tempered safety variants**.

All functionalities are available in double glazing units with high-performance coatings to ensure passenger comfort.



Key Glazing Performance factors

LIGHT TRANSMISSION (LT)

Indicates the percentage of visible light that passes directly through the glass.

U-VALUE (Ug)

Represents the rate of heat loss through the glass, measuring thermal transfer from a warmer area to a cooler one. The lower the Ug-value, the better the insulation. Expressed in W/m²K.

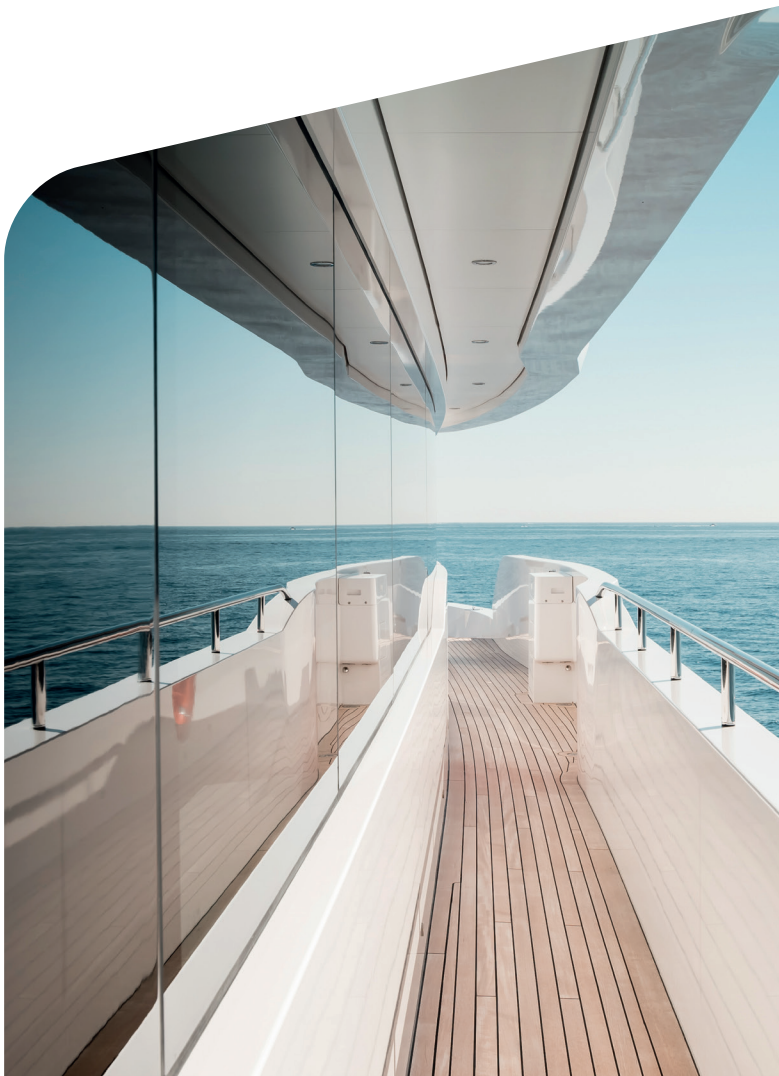
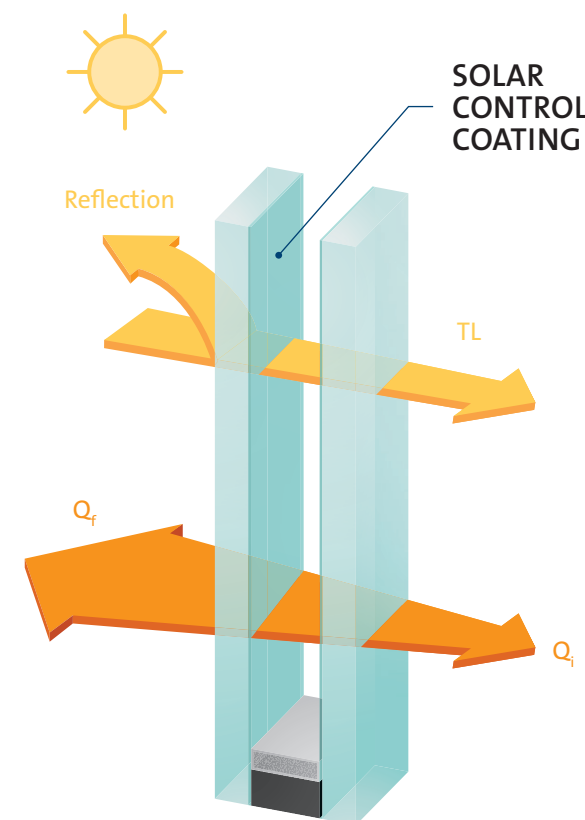
SOLAR FACTOR (G-VALUE)

Measures the percentage of solar energy (infrared radiation) transmitted through the glass. Indicates the glazing's effectiveness in limiting heat buildup inside a space. A lower G-value enhances indoor comfort by reducing solar heat gain.

COMFORT & SUSTAINABILITY BENEFITS

Our double glazing solution combines these advantages:

- ▶ Superior solar control paired with enhanced thermal insulation reduces the need for HVAC systems, resulting in significant energy savings and a substantial decrease in CO₂ emissions.
- ▶ Allows for increased usable space near glazed areas while minimizing glare and creating a more comfortable onboard environment.
- ▶ Improved acoustic performance when combined with STADIP Marine Silence glass, offering enhanced sound insulation.





Frame & Glass Specifications

WINDOWS, SIDE SCUTTLES, WINDOW WALLS & WINDSCREENS

Generally, all windows and side scuttles should be of insulated “energy saving” double glass with transparent soft KMU coating on face 2 for heat radiation. For double or triple glazing units, laminated glass panes with thickness less than or equal to 10 mm should be made with ORAÉ® to minimize the carbon footprint. Crew cabins facing daylight alleys and lifeboat decks shall use one-way mirrors to prevent visibility from outside.

GLASS SPECIFICATIONS

- ▶ **LT:** 60% with variation depending on laminations and glass thickness
- ▶ **Ug:** 1,0 W/m²/K or better
- ▶ **G-value:** 0,27 or better
- ▶ **Glass Coating:** KM ultimate 23/1

GENERIC GUIDELINES FOR FRAMES AND ASSEMBLY

- | | | | |
|--|--|---|--|
| ▶ Windows Material
Steel frames welded to the shell or bulkhead plating. | ▶ Tightness
Windows and portholes must be completely tight according to rule requirements. Tightness must be tested. | ▶ Topcoat Treatment
Must be completed before glass installation. | ▶ Water Tightness Test
Must comply with ISO 3903 standards. |
| ▶ Window Type
Fixed type in accommodation areas. | ▶ Surface Treatment
Sandblasting 2.5, ZN silicate 70 microns. | ▶ Sealing
Permanent elastic and UV-protected silicone packing, tolerating up to 300°C during short welding periods. | ▶ Thermal Bridge
Installed to prevent ice formation on the frame during cold conditions. |
| ▶ Frame Material
Hot extruded high-tensile steel. | | | |

Windows and side scuttles are to be fitted according to Classification Societies' rules (ISO 3903), with sizes and locations as indicated in the General Arrangement (GA). Exterior windows facing life-saving appliances, embarkation stations, and other escape routes must meet fire integrity standards as per regulations.

FIRE-RATED WINDOWS & GLASS

Fire-rated windows must meet both energy efficiency and fire safety performance requirements:

GLASS SPECIFICATIONS

- ▶ **LT:** better than 60%
- ▶ **Ug:** 0,9 W/m²/K or better
- ▶ **G-value:** 0,27 or better
- ▶ **Glass Coating:** KM ultimate 23/1

▶ UV Stability

Tested and certified for no formation of bubbles or yellowing after 5000 hours of UV radiation exposure (EN 12543-4:2011).

▶ Warranty

5 years minimum from Glass Manufacturer and Frame Maker, based on quality guidelines.

All glass must meet these standards:

▶ Tempered Glass

According to ISO 614.

▶ Glass Composition Calculation

As per EN 410-2011 and EN 673-2011

▶ Environmental Product Declaration (EPD)

Verified according to EN 15804 & ISO 14025.

▶ Ground-Edge Finishing

For higher strength.

▶ Selectivity

Must be greater than 2 (Selectivity = Light Transmittance/Sun Factor).

▶ Glass Retainer

Stainless steel (316), ground to corn 180.

Five percent spare glasses (at least one spare glass) should be delivered for each type of window or porthole before the ship departs, excluding wheelhouse windows.

WHEELHOUSE WINDOWS & GLASS

The wheelhouse windows incorporate heated, energy-saving double glazing units.

GLASS SPECIFICATIONS

- ▶ **LT:** 70% with variation depending on laminations and glass thickness
- ▶ **Ug:** 1,0 W/m²/K or better
- ▶ **G-value:** 0,31 or better
- ▶ **Glass Coating:** KM ultimate 24/1

▶ Heating Mechanism

Wire-heated glass, compliant with DIN ISO 3434 and IMO Load Line Convention (3-30 W/dm² power consumption).

▶ Tempered Glass

According to ISO 614.



SKYLIGHTS

Skylights must be provided as shown on the General Arrangement (GA) and protected by railings. The glass construction features a double design with welded steel frames, adhering to the same specifications as the other windows in the structure.

GLASS SPECIFICATIONS

- ▶ **LT:** max 47% with variation depending on laminations and glass thickness
- ▶ **Ug:** 1,0 W/m²/K or better
- ▶ **G-value:** 0,21 or better
- ▶ **Glass Coating:** KM ultimate 25/1



WINDSCREENS

Windscreens should be installed on deck areas as per the GA drawing. The final height will be determined during the basic design phase.

► Main Frame

Steel structure.

► Glass Frame

Sea-resistant aluminum profiles.

► Glass

SGP laminated to reduce the risk of delamination due to humidity ingress.

Weight savings & CO₂ reduction

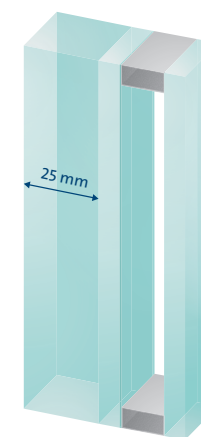
STADIP MARINE VETROTECH GLASS

A lighter solution providing the same performance

A specific laminated glass with thinner compositions, maintaining the same mechanical strength and certified by an approval classification society.

STANDARD DGU SOLUTION

25 mm ISO 614 pressure pane

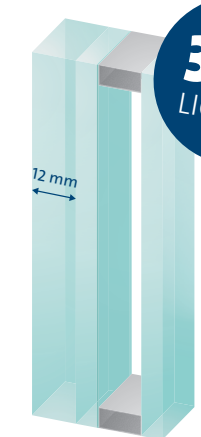


Weight 94,1 kg/m²



From a double glazing
with a 25 mm + 6 mm
to a solution with
a 12 mm + 6mm

VETROTECH SOLUTION



35%
LIGHTER

Weight 61,6 kg/m²

ORAÉ® LOW EMBODIED CARBON GLASS

ORAÉ® is a glass with a low embodied carbon achieved by using 64% recycled content and renewable electricity.

► Benefit:

• **Verified Environmental Product Declaration (EPD).**

• **Carbon footprint:**
6.64 kg CO₂ eq./m²
(for a 4mm substrate),
reducing CO₂ by 42% compared
to the standard European
product PLANICLEAR.



FIND TOMORROW'S GLASS TODAY



Calumen® is a glazing configurator designed for all building professionals, whatever their level of expertise in glass products: architects, designers, engineering offices, consultants, façade makers, window manufacturers, glass processors and general contractors.

**DO YOU STILL HAVE QUESTION?
PLEASE CONTACT US!**

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