marine glazing Brombach + Gess

IDEAS IN GLASS

marine glazing
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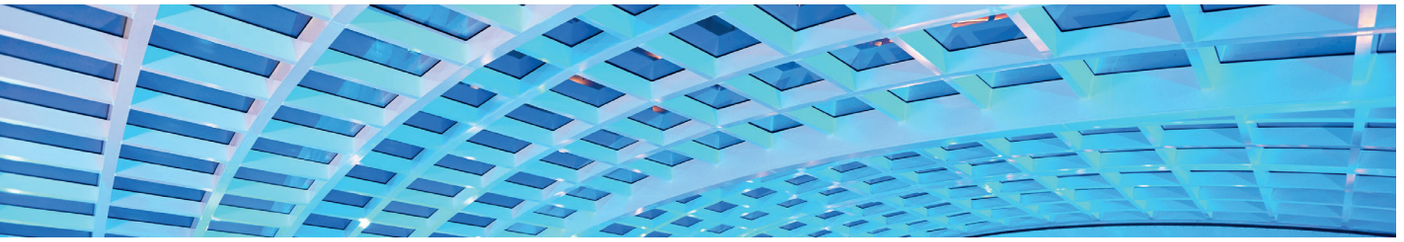
marine glazing - Ideas in Glass®



About Brombach + Gess

30 years ago, Brombach + Gess was one of the first company to introduce glass bonding in commercial shipbuilding.
A new mounting solution was needed for new design requirements such as continuous window bands or glass facades. Here, for the first time, glass was included in the design on a larger scale and was directly bonded to the ship structure.

Facade systems, which are common in onshore building, can only be used to a limited extent on ships, which are subject to movement and torsion during operation.
Stress peaks, which lead to breakages and leaks over time, occur between the hull, facade systems and glass. As a result of these conditions, glass bonding suggested itself as a solution.

Today our construction expertise covers smaller inland waterway vessels, river cruise vessels and cruise ships for world wide cruise.

Steel and Metal components

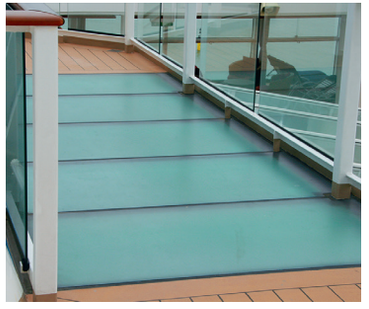
With our own metal processing company we are able to offer steel and metal components for our products.

This allows us to respond flexibly to our customer wishes.

Why Brombach + Gess?

Our Skills - Your Benefit

- Product Developments for Future Ship Design
- Individual and innovative solutions
- Comprehensive technical advice
- Constant product improvements
- Many years of experience
- High Quality Standards
- Cooperation with experienced glass suppliers and engineering offices
- Reliable management of complex projects



ABOUT BROMBACH + GESS

The gluing and installation process

With the glass gluing technology the glasses are included in the construction on larger scale.
The glasses are directly glued to the ship structure to create continuous window bands or glass facades and are embedded flush in the outer skin of the ship.

Considering the following conditions, the product quality can be significantly improved:

- The construction and work steps which precede installation must be adapted for the bonding.
- The structure must be designed such that the glass can be embedded appropriately for its geometry.
- The coating on the substructure must be designed to be suitable for the adhesive.
- The corrosion protection which is applied to the substructure must be compatible with the adhesive.

The gluing and installation process requires expertise and experience. Our team consists of specialists, certified as „European Adhesive Bonders“.

Glass Characteristics and Technical Consultation

Brombach + Gess supports in the technical consultation of glass and steel/metal components of your project.
We help in choosing the right glass product according to technical glass values, like light-transmittance t_v (%), thermal properties U-value [W/(m²K)] and solar energy/solar factor g-value (%) and show the possibilities of glass colours.

Our glasses are proofed according to DIN ISO 614.

Glass gluing technology offers benefits

- The glass is glued directly to the load-bearing supports for the deck. As a result, the supports are in line with the window plane and allow for a barrier-free interior.
- Thanks to the uniform positioning on the adhesive bed, there are no stress peaks which overstrain the glass even under extreme distortions
- The bonding technology even allows the glass to be installed into prefabricated blocks during the construction phase before these are put together in the dry dock to form the ship.
- Construction tolerances in steel construction can be offset to a certain extent through the application of adhesive in various thicknesses.
- Leaks are avoided since no water can collect on the edges of protruding frame sections. The glass is entirely embedded in sealant.
- Cleaning is made much easier.

Architecture & Design

Continuous, frameless glass surfaces make elegant and transparent construction forms possible.
For a ship, on which space is a valuable commodity, glass projects with a frameless design support the illusion of more space and an unbounded view of the panorama which is rolling by.

In design and architecture, this technology offers valuable possibilities such as

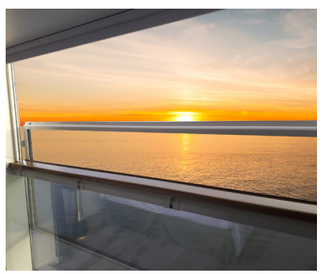
- Architectural freedom
- Modern design
- Innovative glass structures

STRUCTURAL SEALANT GLAZING SYSTEM

Loggia-Cabin Window System

The innovation for more comfort, transparency and privacy in passenger cabins.

- New and innovative cabin category
- With touch of a button the living space becomes the „Loggia“
- Infinite-feeling - Walking right out to the water’s edge
- Protection from environmental influences without excluding from the environment



In a conventional balcony cabin, the outdoor area can only be used in good weather conditions and at comfortable temperatures. The balcony is only available for the exterior area and limits privacy to the sides.
Therefore Brombach + Gess developed the idea that the former balcony area becomes a permanent part of the cabins and can be used, in its entirety, while maintaining privacy.
The new cabin type is delineated by a horizontally sectioned panoramic glass front.

Special Driving Concept

The upper movable pane can be lowered in front of the fixed lower pane by the passenger. For opening the upper glass element moves outward and down in front of the lower element.
Together with the movable handrail, located in front of the window, then forms a glazed balustrade. The result is a “Loggia”.
When closed, the two glass elements form a room-height, even and sealed glass facade.

Experience this innovative concept by watching the short video clip!
(also available on our website)

Glass Sliding Roof out of Composite Structure

Effective weight saving, durability, transparency and innovative design.

- Significant weight saving of 43% in comparison with an aluminium roof
- Optical Lightness
- Architectural benefits owing to a more pleasing design
- „Self-Supporting“ structure
- No corrosion and lower material fatigue

Brombach + Gess has developed, in cooperation with DNV-GL, Stükerjürgen Aerospace Composites and Schiffstechnik Buchloh, a new and innovative lightweight construction in composite material for a glass sliding roof.
This self-supporting composite design is a modern and beneficial alternative to designs supported on a supporting structure, for example in weight reduction: in comparison with an aluminum roof, 43% weight saving can be achieved here. This means a net reduction of 20.1 tonnes in the total weight.

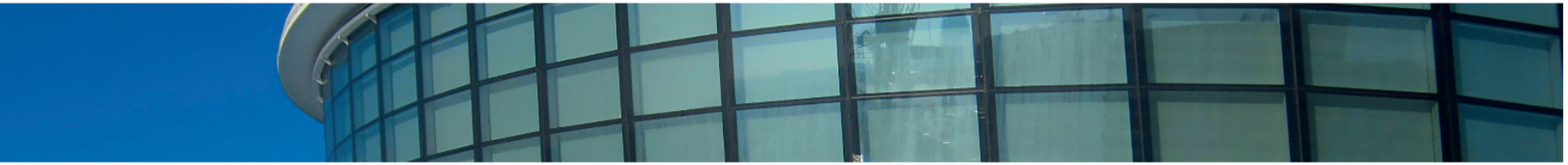
Composite Structure

Composite materials offer additional benefits because they are not vulnerable to corrosion and have better resistance to fatigue.
Thanks to the new design, the new glass area is increased by 18% and results in a lighter and more aesthetically pleasing structure. The grill-type supporting structure with modern semicircular design and the simple modular construction provide additional benefits.

For an architects point of view, ideally the supporting structure for a design should be invisible. While this is still not entirely possible, the new glass sliding roof concept comes very close to this ideal.

Experience this innovative concept by watching the short video clip!
(also available on our website)

PRODUCT NOVELITIES



Glued Glass Facade

- Architectural freedom of glass surfaces
- Technical advice on glass and glass values
- Consideration of sun-, light-, and heat protection and combinations

DUROmare Glass - Safe & Light

- High pressure load with thinner glass buildup
- Explicit weight reduction possible
- Especially developed for maritime needs

Special Glasses

- Walkable Glass
- Curved Glass
- Dimmable Glass
- Switchable Glass
- Printed Glass
- Heated Glass

Frameless Sliding Window

- Frameless over the whole suface - maximum transparency
- Simple and intuitive operation

Panoramic Glass Sliding Roof

- Complete turn-key solution
- Use of public spaces whatever the weather
- Solar-filtered glass lets enough light in but insulates against the heat

Glass Dome

- For light-flooded areas, like receptions areas
- Complete turn-key solution

Fire-Resistant Glazing

- Narrow frame and unobtrusive design
- Maximum Transparency
- MED Approval (A0 MED-B-8775; A60 MED-B-8776)

Windscreen, Balustrades and Partitions

- Multifunctional System
- Flexible with supplementary equipment
- Available in lightweight aluminium or as steel construction

Glass Sliding Door integrated into the Facade

- Perfect integration of the sliding door into the facade
- No interruption of the overall view

Skylights which can be openend

- Efficient ventilation of roofed areas
- Natural lighting in roofed areas

NEW

Loggia-Cabin Window System

- New and innovative cabin category
- Infinite-feeling – Walking right out to the water's edge
- With touch of a button the living space becomes the „Loggia"

Glass Sliding Roof out of Composite Structure

- Innovative lightweight design
- Weight savings of 43%, compared to the total weight of a reference aluminium roof
- Net reduction of 20.1 tonnes in the total weight

PRODUCT PORTFOLIO

AIDA Cruises

- AIDAnova
- AIDAstella
- AIDAmar
- AIDAsol
- AIDAblu
- AIDAbella
- AIDAluna
- AIDAdiva

Celebrity Cruises

- Reflection
- Silhouette
- Eclipse
- Equinox
- Solstice
- Century

Hapag Lloyd Cruises

- Europa 2

Viking River Cruises

- Fleet of over 50 River Cruise Ships

Royal Caribbean Cruise Line

- Spectrum of the Seas
- Ovation of the Seas
- Quantum of the Seas
- Anthem of the Seas
- Jewel of the Seas
- Radiance of the Seas
- Brilliance of the Seas
- Serenade of the Seas

TUI Cruises

- Mein Schiff 2 (ex. Mercury)
- Mein Schiff 1 (ex. Galaxy)

Yacht

- Variety of glass projects on yachts

Crystal River Cruises

- Crystal Bach
- Crystal Mahler
- Crystal Debussy
- Crystal Ravel

Dream Cruises Star Cruises

- World Dream
- Genting World
- Superstar Virgo

Norwegian Cruise Line

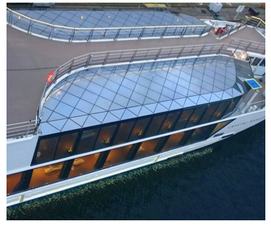
- Norwegian Encore
- Norwegian Bliss
- Norwegian Joy
- Norwegian Escape
- Norwegian Getaway
- Norwegian Breakaway
- Pride of America
- Norwegian Pearl
- Norwegian Jade
- Norwegian Jewel
- Norwegian Dawn
- Norwegian Gem
- Norwegian Star
- Norwegian Spirit

Diverse Passenger Vessels

- Sonnenkönigin
- Panorama Yacht MS Saphier

Diverse River Cruise Vessels

- Gräfin Cosel
- August der Starke
- Dresden
- Katharina
- Brunnen
- Flüelen
- Turicum 1-3
- Black Jack
- Gilles



REFERENCES