



Case Study:

## SentryGlas® ionoplast interlayer sets high standards in quality and toughness for the yacht industry

Protection against UV, plus enhanced security

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*The SL108 yacht (top), from the Sanlorenzo shipbuilding yards, uses Viraver glass panels made with high-resistance SentryGlas® ionoplast interlayer for all frontal and lateral glazing. The structural interlayer was selected due to its ability to withstand both impacts and harsh climates. The laminated glass made with high-resistant SentryGlas® interlayer is also used for Sanlorenzo's SL72, SL82 and SL88 models. © Sanlorenzo.*

Viraver Technology s.r.l. (Padua, Italy), a supplier of advanced glazing solutions, uses SentryGlas® ionoplast interlayer for the front and side glazing of new yachts from Sanlorenzo S.p.a shipbuilding yard. Dimensions of the stylish glass panels range from 1 m to 3 m (3,28 x 9,83 ft), by 1 m to 1.5 m (3,28 x 4,92 ft).

The yacht industry demands the use of glass structures that will withstand both impacts and harsh climates. The Italian company Viraver, decided to address these requirements by adopting SentryGlas®. The interlayer enhances the shine and transparency of glass while providing exceptional long-term resistance to weathering and impact. The clearness and strength of the glazing endure after lengthy exposure, even when the thickness of the glass is minimal.

All components used for yacht construction are required to meet demanding standards laid out by the marine construction industry. Glass panels with SentryGlas® were exposed to 500 consecutive hours of salt spray to verify resistance to harsh weathering conditions, particularly saline, and thus guarantee durable safety at sea. Evaluation of the results showed the panels to be unchanged, both in terms of their resistance and their transparency.

The use of SentryGlas® in marine glazing also provides excellent postbreakage properties. The interlayer is designed to withstand hurricanes along United States coastal zones. For marine construction, all windows are required to protect against water pressure and leakage, and to prevent glass from falling out in the event of

breakage. SentryGlas® offers mechanical properties that help glazing remain intact, even if broken, meanwhile maintaining excellent rigidity, strength and clarity.

SentryGlas® provides marine architects and designers new design possibilities, because the interlayer is flexible and tough enough to meet safety requirements at a reduced thickness and weight. Laminated glass made with SentryGlas® interlayer has strength that's equivalent to monolithic glass; however, the laminate reduces total weight - a attribute important to marine design.

This represents one of the first European applications of SentryGlas® in the construction of yachts. "In a segment where weight restrictions for all components are tighter, SentryGlas® was able to demonstrate its extreme versatility and superior quality versus other solutions," comments Roberto Alfonso of laminator Viraver. "The design of a yacht requires both high functionality and aesthetic standards. Design form and aerodynamics must combine tradition with technological innovation in order to respond to contemporary trends and necessities. SentryGlas® lives up to these standards, provides optimal performance and guarantees superior safety and protection performance."

Viraver Technology is a company that has become established in the field of glass manufacture due to its style and personality. Thanks to its effective combination of modern technologies and tradition, Viraver is able to respond to any architectural, design and technological

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necessity. Viraver uses its entire industry know-how to combine quality with safety and comfort, while respecting the specific creative requirements of the marine designer.

The Sanlorenzo S.p.a shipbuilding yard was created in Viareggio (Italy) in 1958, and until 1985 produced semicustom made boats made entirely out of wood. The first Sanlorenzo boat made in fiberglass, model SL57, appeared in September 1985.

In April 2005, Massimo Perotti acquired the shipbuilding yard, and it became known as Sanlorenzo S.p.a. Mr Perotti decided to abandon mass production and the industry he previously worked in, to join an entrepreneurial tradition of absolute perfection based on the production of only a few models a year. The Sanlorenzo philosophy focuses on maximum quality, personalization and complete dedication to clients.

#### **Lighter façade panels enable more subtle supporting structures**

For decades, interlayers made of polyvinyl butyral (PVB) have been the industry standard when producing laminated safety glass. Architects are well aware of the possibilities and limitations of such glass when used extensively in façade engineering, for roofing and window panels. In contrast, SentryGlas® enables an entirely new approach because the interlayer is over 100 times stiffer and five times stronger than PVB. As a consequence, there is an almost perfect transmission of load between two laminated sheets of glass, even at high temperatures, leading to the excellent flexural behavior of the glass when under load - also under direct sunlight in high summer. Accordingly, laminates with SentryGlas® show less than half the rate of deflection when compared to laminates with PVB, when under the same load, and thus almost the same behavior as monolithic glass of the same thickness.

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As well as improved strength and stiffness, other benefits of SentryGlas® include:

- **Safety:** In the event of breakage, glass fragments remain firmly bonded to the interlayer, reducing the chance for injury
- **Security:** SentryGlas® can be used in glazing that withstands bullets, hurricane-force winds and even bomb blasts
- **Durability:** SentryGlas® is extremely durable and resistant to clouding, even after years of exposure
- **Design Versatility:** SentryGlas® can be used in glass manufactured flat or curved, including annealed, toughened, heat-strengthened, spandrel, wired, patterned and color tinted glass
- **UV control:** SentryGlas® is available with or without UV transmittance

Shipbuilder: Sanlorenzo S.p.a  
Laminator: Viraver Technology

## REGIONAL CONTACT CENTERS

Kuraray Co., LTD  
Ote Center Bldg.  
1-1-3, Otemachi  
Chiyoda-ku, Tokyo, 100-8115, Japan  
Phone: +81 3 6701 1508

Kuraray Europe GmbH  
Glass Laminating Solutions  
Philipp-Reis-Str. 4  
65795 Hattersheim, Germany  
Phone: +49 (0) 69 30585300

Kuraray Americas, Inc.  
2625 Bay Area Blvd. #600  
Houston TX 77058, USA  
Phone: +1.800.423.9762

Kuraray Mexico S.de R.L. de C.V.  
Homero 206, Polanco V seccion,  
cp 11570,  
Mexico City, Mexico  
Phone: +52 55 5722 1043

For further information  
about SentryGlas®, please visit  
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