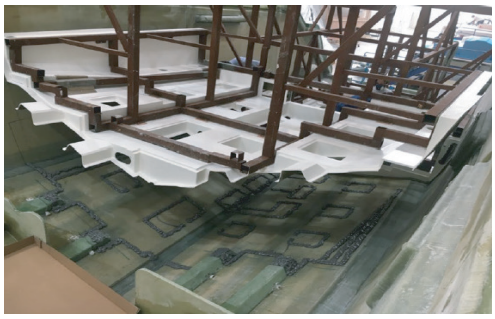
SCIGRIP® ADHESIVES

CUSTOMER CASE STUDY

SCIGRIP's SG230 HV Adhesives Qualified in Key Structural bonding processes at Ferretti Group

SCIGRIP began working with the Ferretti Group with the aim of qualifying SG230 HV and improving production efficiencies through smarter composite bonding processes.



SCIGRIP's Methacrylate adhesives have been used for years in structural bonding applications in the marine sector, reducing surface preparation requirements and providing a versatile bonding system that can be tailored for the individual gap size and working time requirements of each job.

The Situation

Bonding is a crucial parameter that greatly affects the performance and quality of components. In order to consolidate the construction process, as well as implement a new production line, Ferretti and SCIGRIP explored the possibility of replacing classic polyester-based adhesives with SCIGRIP's innovative methacrylate adhesives.

An intensely productive collaboration took place between the two companies, strengthened on one hand by Ferretti's decades of expertise in building leisure boats and on the other with SCIGRIP'S bonding knowledge. With Ferretti's constant drive for production process improvements, always a key characteristic of this innovative company, outstanding results were achieved and, after an extensive period of testing and validation, SCIGRIP methacrylate adhesives were approved for use in Ferretti's moulding yard.

The Solution

SCIGRIP SG230 HV: A Perfect Match

SCIGRIP's SG230 HV adhesive is a two-part methacrylate with an average mixing ratio of 10:1. Thanks to its application characteristics and excellent mechanical performance it was a perfect match for the hull manufacturing process used in the Ferretti assembly lines.

The production lines at the M&S Composite Manufacturing Yard, Ferretti's assembly department, are based on the concept of bonding together structural elements that are built off-site to maximise repeatability in the building stages, resulting in shorter production cycle times. The yard requires the very high performance structural bonding (in terms of both mechanical bond strength and fatigue performance) offered by SCIGRIP's MMA adhesive, when bonding the fibre-glass hull shell and the structural elements, specifically those of the engine room and other key load bearing parts, that are laminated off-line. Adopting a solid and reliable process and using materials that were independently certified for marine use were key requirements for the bonding process.

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FERRETTIGROUP

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SCIGRIP's SG230 HVA Adhesives Qualified in Key Structural bonding processes at Ferretti Group

SCIGRIP SG230 HV: A Perfect Match, Cont'd

The product specified was SCIGRIP's Lloyd's approved SG230 HV adhesive, supplied in 189 litre drums. This high viscosity, thixotropic adhesive can also be applied in void free bead sizes up to 80mm in thickness without sagging or any reduction in bonding performance. Different hardener speeds were supplied allowing customised working times to match the required joining times.

Given the large bonding surface areas, it was necessary to use an application system that dispenses a large quantity of product in the shortest possible time. SCIGRIP also specified a special drum extruder to dispense the product. The large drum product format makes it possible to apply the product without any production stoppage time for changing the drums and using a machine optimises the accuracy of the component mixing.

Further optimisation of the production process is being studied for the future, which will greatly reduce the surface preparation stage and make full use of another feature of SCIGRIP's SG230 HV adhesive: its high capacity to adhere to smooth, gel-coated and moist surfaces makes it possible to avoid/reduce preliminary abrasion of the composite. This will further reduce the production cycle time, while also reducing the production of dust that is often produced by this sanding and grinding. This latter aspect is also strategic for the M&S Composite Manufacturing department, as the dust is not only harmful to personal health but is also extremely detrimental to the quality of the production processes in the moulding department (additional material cleaning costs are required). The impact on operating costs linked to management and disposal of the dust particles generated by all of the surface abrasion processes is also far from being negligible.

This case study was taken from experiences shared with us by Alfonso Ferretti, Shipyard Supervisor and Composite Manufacturing at the Ferretti Group.

SG230 HV Additional Information

PRODUCT PROPERTIES (In Minutes)

Cartridge	Adhesive	Activator	Working Time	Fixture Time
SG230-30	SG230HVA	SG605B	25 - 30	45 - 55
SG230-40	SG230HVA	SG214B	35 - 45	60 - 75
SG230-60	SG230HVA	SG216B	50 - 70	140 - 170
Bulk Only	SG230HVA	SG218B	70 - 90	180 - 210

Time to reach 70% of ultimate strength in lap shear @75°F (24°C)[3]

TYPICAL PHYSICAL PROPERTIES @75°F (24°C)

Tensile Strength[6] PSI (MPa)	>3,000 (21)
Maximum Tensile Elongation[5]	>100%
Tensile Modulus[5,6] PSI (MPa)	80,000 – 103,000 (552 – 710)
Lap Shear Strength[3] PSI (MPa)	>2,000 (14)
Service Temperatures	-40 to 180 °F (-40 to 82 °C)

TYPICAL ADHESIVE CHARACTERISTICS @75°F (24°C)

SG230HV SERIES *Uncured*	Part A *Adhesive*	Part B *Activator*	A+B *Mix*
Color	Off White	Gray	Gray
Mix ratio/volume	10	1	-
Mix ratio/weight	8.4	1	-
Density, g/cc	0.97	1.15	0.99
Density, lb/gallon	8.09	9.60	8.25
Viscosity, cps[4]	900,000-1,400,000	120,000-180,000	-