

The revolution starts from the bottom up

Sandwich panels – and more. Tecnowall manufactures profiles intended to replace wood in the vehicle's walls, roof and floors, using composite materials, and in combination with lightweight metal elements. The company's new structural profile with an aluminium core allows for floor anchoring, bolting it from the bottom to the frame, saving on time and assembly costs.

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Innovation is everything for a company that wants to be competitive in a global market that is increasingly more complex, which is why TecnoWall doesn't stop at the results it's achieved, but continues to be proactive, year after year. A relatively young business, founded at the start of the millennium, the Italian based TecnoWall has sought right from the outset to bring innovation to the specific segment of sandwich panels from which the bodies of RVs are made, an industrial sector that for a long time has been bound by established, almost immutable patterns. TecnoWall's product catalogue lists various types of sandwich panels, created by combining a variety of different linings (plywood sheets, slabs of fiberglass, aluminium, etc.) with an internal insulating core (EPS expanded polystyrene foam, polyurethane foam, XPS extruded polystyrene foam, and more). The components are bonded in a press using either the traditional liquid polyurethane adhesive method, or more modern systems such as a hot melt thermal fuse adhesive and bicomponent, which is very resistant and allows for savings in material. However, TecnoWall is most innovative with its in-house production of perimeter profiles as an alternative to traditional wooden slats. Indeed, the Tuscan based manufacturer has for some time now been making use of a specific product named TecnoPlast, built with pure, non-recycled, prestigious materials, providing excellent mechanical resistance characteristics. It is produced in plates 78 cm wide by 450 cm long, and a maximum height of 60 mm, which are then cut or shaped as required. Unlike wood, it has an extremely low water absorption capacity (on average less than 2.5% over the long term; under 0.2% in 24 hours, in compliance with EN 12087), making it immune to possible infiltrations in sandwich panels. TecnoPlast is proposed in three variations, based on the density: 350, 400 and 450 kg/m³. But the crown jewel of TecnoWall's offering in this field are bars made with the same polyurethane base as FibroPlast and TecnoPlast: also intended to replace the skeleton of wooden slats inside flo-

ors, but with unique features that make it one of the most interesting entries in TecnoWall's product catalogue. The bar incorporates an aluminium profile that makes the element extremely resistant, while not foregoing its lightweight characteristics. The metallic element does not occupy the entire thickness of the bar, so as to create the necessary thermal break. These structural profiles can be used in various parts of the body of a motorhome, but their optimal application lies in floors. Normally, sandwich floor panels are bolted to the side members of the chassis and then, to cover the heads of the bolts, a PVC coating is laid that forms the floor level inside the cabin. TecnoWall exceeds these limits, thanks to its structural profiles inserted in the floor's sandwich panels. The most evolved version of the structural profile has a cavity in the lower part of the aluminium profile: inside this channel are inserted metal rods with a special threaded hole in which the screws are inserted. Bolted to the chassis from below, the panels therefore have an incorporated fastening system and do not require subsequent work processes. This allows builders to save on production and assembly times, as well as providing extreme freedom in conceiving the interior decor. Using a threaded bar as wide as the entire floor would prove too heavy and costly, so small bars only a few centimeters long are employed, interspersed with pre-calibrated polystyrene elements, so that the fastening hole matches perfectly with the chassis' side member. With technologically advanced products such as these, TecnoWall allows recreational vehicle manufacturers to innovate in their building techniques, providing concrete solutions to the everlasting issue of water infiltration and weight containment.

FibroPlast

Launched on the market two years ago, FibroPlast is one of semi-finished products TecnoWall provides to overcome the limitations of wood in the construction of motorhome bodies. Many similarities exist with TecnoPlast, starting with the polyurethane base and bars. However, FibroPlast goes one step further, introducing into the mixture a percentage of fiberglass (about a third of the total), allowing for a weight reduction of about 30% with the same mechanical characteristics. In essence, FibroPlast is perfect for building perimeter profiles of sandwich panels used for the body: it's a material that has a high resistance to torsion, providing good thermal insulation, adheres easily and, not least, does not deform under the typical heat motorhome bodies are subjected to when exposed to sunlight (operating temperature limits -40/+100°C).

"Fibroplast is an exceptional product," affirms Yuri Pierini, owner and sales manager of TecnoWall, "and finally, two years after its introduction to the market, manufacturers everywhere are beginning to appreciate its qualities, not just here in Italy. We've just completed the supply of bars to a manufacturer specializing in large slide out motorhomes: extreme mechanical resistance was required, especially in terms of torsion, as well as outstanding thermal insulation characteristics, and FibroPlast was chosen as an advanced material capable



DENSITY	ISO 845	kg/m ³	300 ± 10%	350 ± 8%	400 ± 7%
THERMAL PROPERTIES					
Thermal conductivity	UNI EN 13165	W/m ² K	0,041	0,043	0,049
Coefficient of linear thermal expansion		%	0,044	0,049	0,059
Glass transition temperature	DMA (3 point bending)	°C	>140	>140	>145
Temperature limits in use		°C	-0,4	-0,4	-0,4
COMPRESSION RESISTANCE WITH DEFORMATION OF 10%					
Parallel to the fibres direction	ISO 844	kPa	>12000	>13000	>15500
Perpendicular to the fibres direction	ISO 844	kPa	>4000	>4100	>4500
FLEXURAL STRENGTH	UNI EN ISO 178	N/mm ²	>13	>21	>23
ELASTIC MODULUS	ISO 527-2	N/mm ²	>430	>500	>750
FLEXURAL MODULUS	UNI EN ISO 178	N/mm ²	>680	>1050	>1100
FRIABILITY	ASTM C 421	%	<1	<1	<0,5
TENSILE STRENGTH	ISO 572-2	N/mm ²	>9	>15	>15
IMPACT RESISTANCE	DIN EN ISO 179-2	kJ/m ²	>16	>20	>22
ELONGATION AT BREAK	ISO 527-2	%	>1,5	>1,8	>2,2
SCREW EXTRACTION RESISTANCE					
Parallel to the fibres direction	Pull-out test	(N)	>800	>1420	>1600
Perpendicular to the fibres direction	Pull-out test	(N)	>950	>1640	>1800
WATER BEHAVIOUR					
Long term water absorption	EN 12087	%	<2,6	<2,7	<2,8
Dimensional change after 24 hours in the water		%	<0,3	<0,2	<0,2
REACTION TO FIRE	UL94		V-1	V-2	V-2

of ensuring all these qualities. We've invested a great deal in this product, including the very recent acquisition of new machinery to cope with an increase in production. Operational as of January 2016, the new plant will feature a controlled liquid dosing system, with constant temperature monitoring and an automated management of the process capable of guaranteeing constant quality, fewer imperfections and no constraints imposed by hot or cold seasonal changes." Fibroplast is

supplied in plates, starting from 780 mm in width and 450 cm in length, with a maximum thickness of 60 mm. It is produced in three variations: 300, 350 and 400 kg/m³ in density. The intermediate FibroPlast 350 version, for instance, provides a thermal conductivity of 0.043 W/m²K, flexural strength exceeding 21 N/mm², tensile strength greater than 15 N/mm² and long term water absorption (EN 12087) below 2.7%.



Company Profile

TecnoWall was founded in 2001 in Tavarnelle Val di Pesa, working straightaway with companies such as Arca and Mirage, supplying sandwich panels designed for motorhome bodies. In 2006, the company's production site was transferred to Poggibonsi, with a subsequent increase in production space in 2009. Today, the business provides employment for about twenty people, availing itself of a covered production site measuring 5800 square meters. TecnoWall continues to operate in the motorhome body segment, supplying manufacturers with sandwich panels for walls, roofs and floors. It makes use of a variety of core materials, from traditional expanded polystyrene (EPS) to more modern extruded polystyrene foam (XPS), as well as closed cell PVC, polyurethane and honeycomb polypropylene. Traditional internal wooden battens are combined with polyurethane frames, using metal reinforcements. With a strong presence throughout the European recreational vehicle market, TecnoWall also boasts business relations with manufacturers in China, Australia and South Africa. The motorhome sector predominates, but the company also works in the naval and heavy transport vehicle sector, in addition to producing panels for the construction of prefabricated housing. TecnoWall possesses UNI EN ISO 9001:2000 certification.

