

LIGHTWEIGHT POLYPROPYLENE PANELS



Lightweight polypropylene panels for reusable packaging, automotive and building & construction

Several companies worldwide use today the EconCore's patented ThermHex technology producing lightweight polypropylene panels and benefiting from the cost efficient continuous production process.

The products of the technology - easily recyclable PP panels can be applied in reusable packaging (sleeve, layer pad, etc.), automotive interior (spare wheel cover, headliner, door panel, etc.) and building & construction applications (concrete casting / formwork panels).



Gifu Plastics from Japan was among the first companies to obtain a license that enabled the use of the patented ThermHex production technology. After the rapid construction of the production line and a startup phase, Gifu Plastics introduced the new product into the Japanese market in 2009. Right from the start the PP panels were available in a thickness range from 5 to 15 mm and later thicknesses up to 30 mm have been added.

The Gifu Plastics product is marketed under the TECCELL product name and comprises of a range of high quality, reusable packaging applications which include boxes, sleeves, divider sheets and collapsible containers.



By now several other market leaders (e.g. Karton S.p.A. or Renolit GOR in Europe or CoroPlast in the US) decided to innovate their products installing ThermHex technology for PP panels. For the packaging industry ThermHex technology enables the production of light weight boxes with outstanding mechanical properties. This reduces CO₂ emissions and transportation cost for the end user.

Applications: Reusable packaging containers & boxes, graphical displays, formwork, temporary fencing, automotive interior, van cladding, ...



Key advantages:

- Increased performance at reduced weight
- Equal performance in both directions
- Reduced PP usage versus traditional PP board
- Reduced production cost versus traditional PP board
- Excellent surface appearance
- Excellent impact resistance
- Excellent compression strength

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For box producers the ThermHex panels are easy to cut, crease, weld and print. Properties as stiffness, strength and impact performance are unmatched by any other PP panel production technology. The equal performance in both principle directions allows for lighter weight box design and reduces trim losses.

In the cost sensitive automotive applications the customers appreciate the resources saving technology very much and achieve a very high level of weight reduction with the PP honeycomb boards. Due to the ability to shape 3D parts by thermoforming the sandwich panels can also be used for more complex parts and where necessary composite skins can be applied on top of the honeycomb.

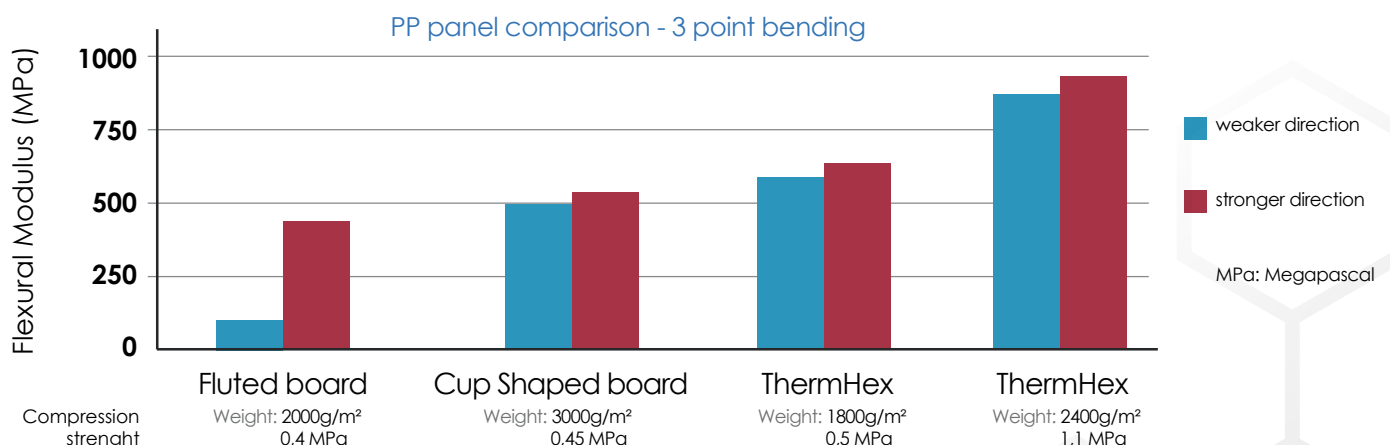
Generally for all applications, including also building & construction segment, ThermHex offers an exceptional rigidity to weight ratio.

Moreover, compared to other PP panel technologies, the ThermHex honeycomb panels can be made in higher thickness and while the panel weight is kept exceptionally low, the stiffness might be even more than 10 times higher compared to the competitive solutions!

For the manufacturer of panels, the ThermHex production technology allows for “resin to panel” conversion in one single continuous production line. Line speeds of up to 10 meter/minute are a reality. Due to the robust performance of the different components in the production line a minimal amount of operators is needed, the production yield is optimized and the product switch overtime is reduced.



The chart shows the results of a comparative study which has been performed on different PP boards. The traditional fluted board uses an extruded I-beam core and is also known as twin wall. The traditional cup shaped board uses a core with vacuum formed cups to support the skins and is also known as bubble board. The overall panel thickness was approximately 10.5 mm. Three point bending measurements were done according ASTM D790M with a span of 220 mm.



The 3 point bending measurements demonstrate that the ThermHex based panels outperform the traditional fluted and cup shaped base panels on stiffness. The ThermHex performance is even more remarkable if one realizes the significant weight reduction of these ThermHex panels versus the traditional products.