

HIGH PERFORMANCE COMPOSITE PANELS FROM RENEWABLE, BIO-BASED POLYMERS.



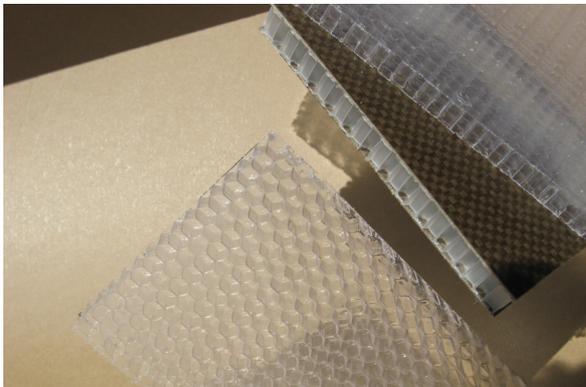
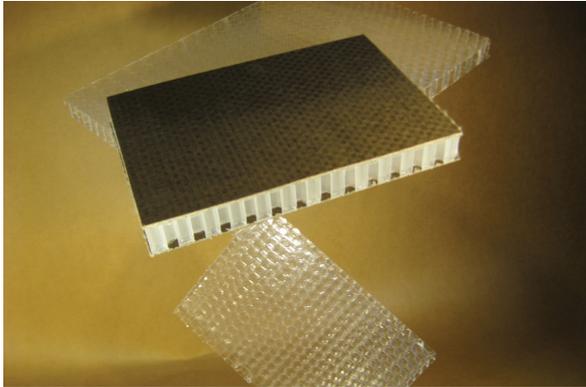
EconCore is proud to present the first 100% bio-based composite panel. Recently EconCore has optimized the patented ThermHex production technology to produce honeycomb cores and sandwich panels made from bio-based plastics.

Today, the exploitation of the economical advantages of weight reduction have become essential for many industries. Bio-based polymer materials are still relatively expensive compared to for example PP alternatives which has limited the use of these materials in structural application. Bio-based sandwich panels can be used in for example re-usable packaging, furniture, automotive interiors or separation walls.

By combining our cost efficient production technology with renewable materials, EconCore is able to present a sandwich panel that has excellent mechanical properties, while still being cost competitive compared to traditional sheet materials.

EconCore has optimized the production technology to produce PLA based hexagonal honeycomb cores using a continuous production process. Only moments after the core is produced skin layers are added in a second step of the continuous production process. These skins could be made from unfilled PLA material to make a mono material panel or, in case a higher performance is required, could be replaced with consolidated flax in a PLA matrix.

Poly-Lactic Acid (PLA) is a biopolymer used to make for example packaging, consumer goods and furniture and is derived from renewable resources instead of oil. A biopolymer offers more disposal options and is more environmentally friendly to manufacture than traditional petroleum-based plastics. Derived from 100% annually renewable resources such as plants, PLA generates significantly less greenhouse gas emissions over the life time when compared to traditional materials like PP.



Key advantages:

- Made from renewable, bio-based polymers
- Increased performance at reduced weight
- Reduced production cost versus traditional panels and materials
- Excellent strength and stiffness
- Good impact

HIGH PERFORMANCE COMPOSITE PANELS FROM RENEWABLE, BIO-BASED POLYMERS.

The below table shows indicative values for a PLA based honeycomb core and a panel made from a PLA core with PLA skins. Three point bending measurements were done according ASTM D790M with a span of 220 mm. The flat compression strength measurements were done according ASTM C365 on samples with 60x60 mm size.

From the table the excellent compression strength of PLA based honeycomb core can be observed.

The right column shows the performance of an actual PLA panel. To make a panel with a comparable stiffness from solid PLA, a PLA sheet thickness of a least 12 mm would have been needed.

PLA ThermHex core and panel technical properties*

Material nomenclature	THPLA80 Core	THPLA80 and 0.8 mm skins Panel
Core material	PLA	PLA
Skin material	Without skin	PLA with a thickness of 0.8 mm
Panel / Core thickness [mm]	3 to 30	18
Panel weight [kg/m ²]	0.25 to 2.5	3.4
Nominal core density [kg/m ³]	80	80
Compression strength [MPa] (ASTM C365-57)	1.1	1.1
Compression modulus [MPa] (ASTM C365-57)	40	40
Flexural strength [MPa] L/W (ASTM D790M)	--	4 / 10
Flexural stiffness [Nm] L/W (ASTM D790M)	--	170 / 350
Flexural modulus [MPa] L/W (ASTM D790M)	--	350 / 500
Temperature range for application use [°C]	-25 to +55	-25 to +55

*preliminary data