



THERMHEX ORGANOSANDWICH LIGHTWEIGHT SANDWICH MATERIAL

THERMHEX POLYPROPYLENE HONEYCOMB CORE WITH GF SKIN



Picture: Fraunhofer IMWS/Sven Döring

LIABILITY FOR DEFECTS

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ADVANTAGES

- > Major cost reduction
- > Significant weight saving
- > High bending stiffness
- > Energy absorbent
- > Resistant to moisture, acids and bases
- > Easy resource-friendly converting
- > 100% recyclable



THERMHEX WABEN GMBH

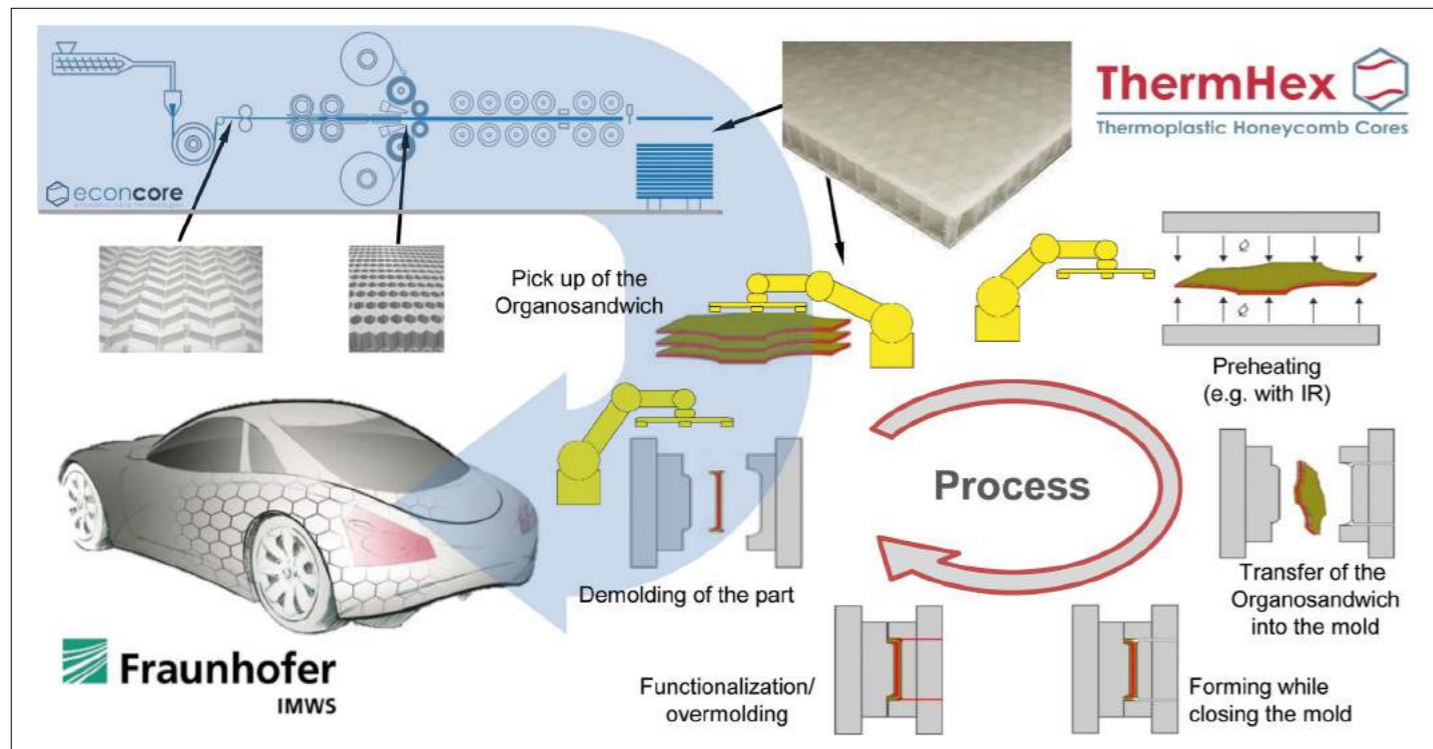
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ThermHex Waben is a licensee of EconCore NV (Belgium), the technology leader for cost-efficient sandwich material production technologies.





Production and processing with functionalization

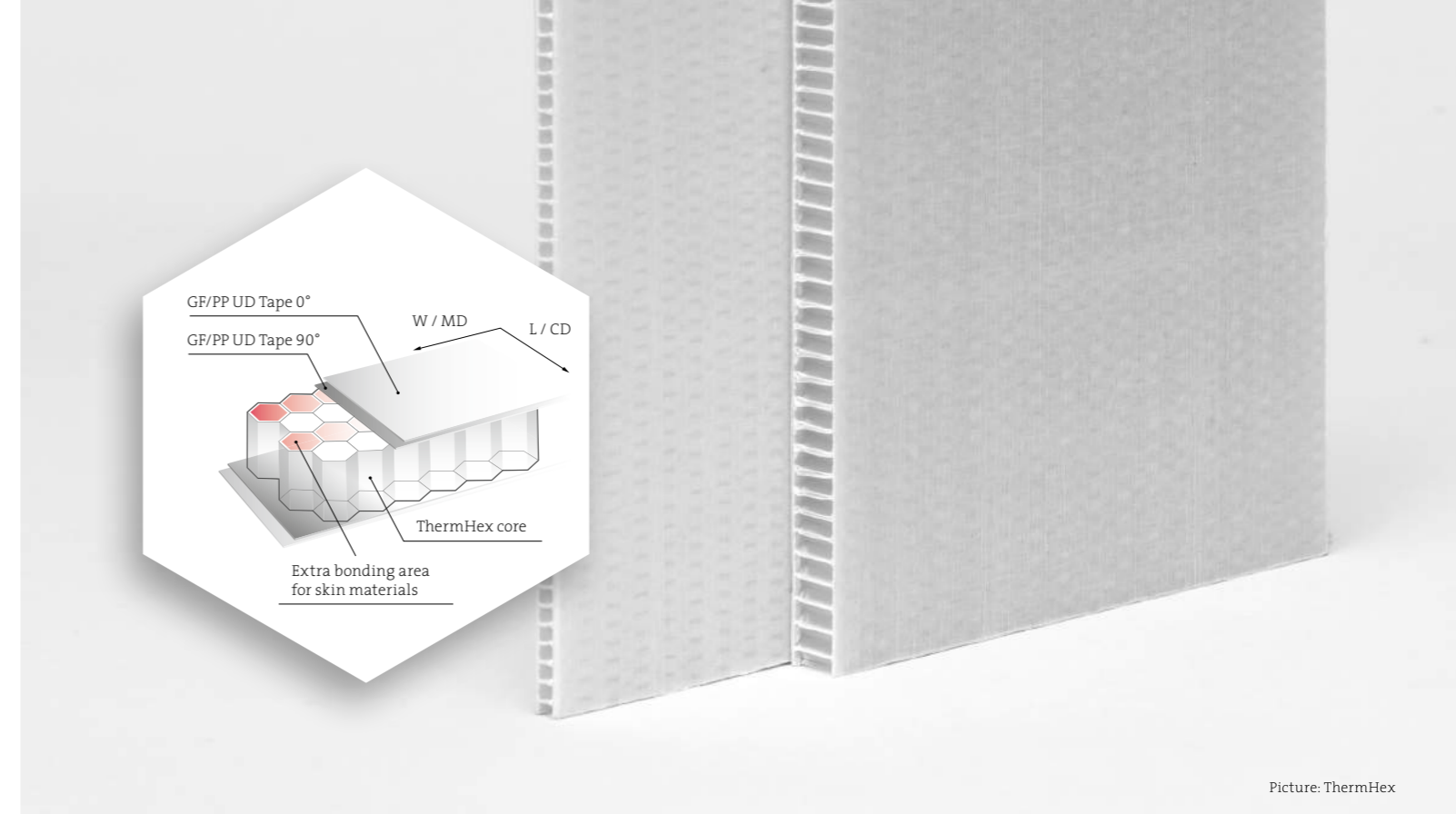
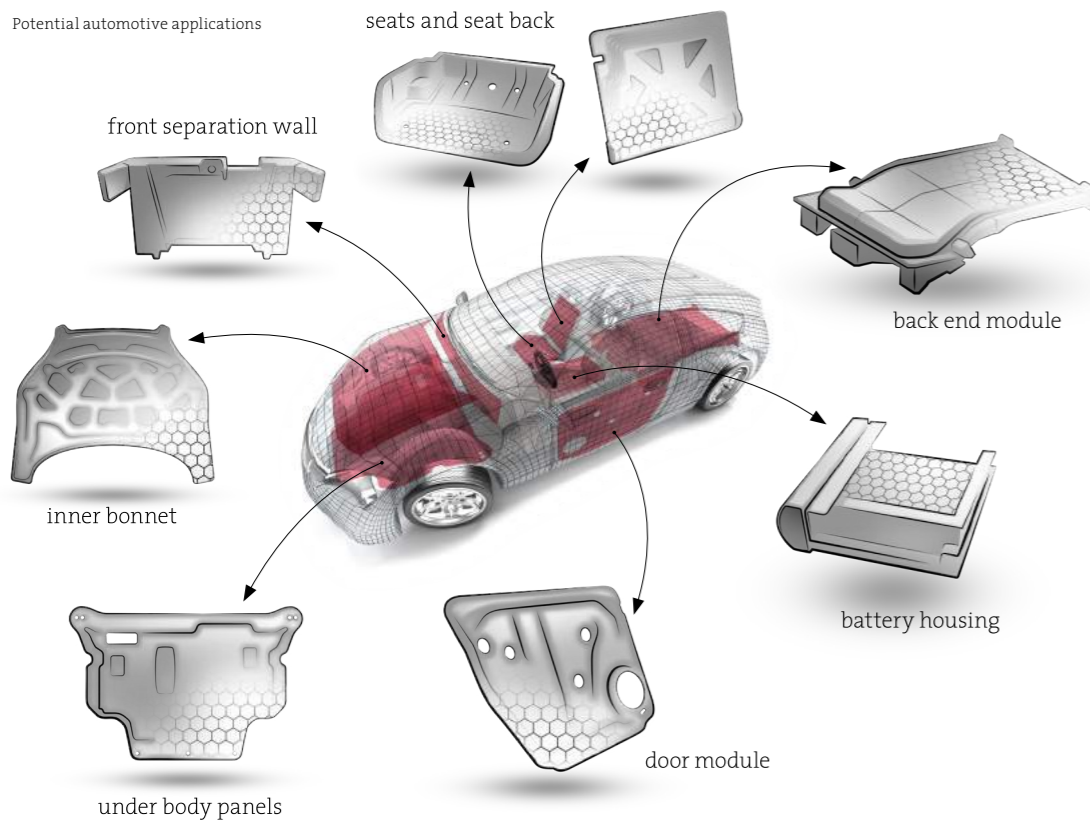
THERMHEX ORGANOSANDWICH – THE NEW SANDWICH MATERIAL.

The Organosandwich production is based on the patented ThermHex process. The process enables the continuous inline production of thermoplastic honeycomb cores in a fully automatic production line.

By using our lightweight Organosandwich weight savings of over 80 % are possible compared to a monolithic construction. In comparison to a monolithic organosheet laminate, a sandwich of the same stiffness requires less number of layers, which means considerable cost savings when using the Organosandwich.

The Organosandwich consist of 0°/90° cross ply laminate skin layers made of continuous glass fiber reinforced polypropylene. The folded honeycomb core material consists of a polypropylene as well. This allows an optimal bonding between core and skin layers in the lamination process by thermoplastic welding. The sandwich can be pressed locally to a monolithic laminate which allows the thermoforming of multi-curved shell structures and the pressing of pressure stable monolithic joining surfaces in one step. The pressed areas offer the possibility of functional integration by means of injection molding. Hence, complex lightweight parts can be produced very cost-efficient in short cycle-times which is essential for many automotive applications.

Potential automotive applications



Picture: ThermHex

PROVISIONAL

PRODUCT DESCRIPTION

Standard dimensions (CD, L x MD, W)	
Sandwich thickness	
Skin layer thickness	
Core thickness	
Cell size	
Weight per unit area	
Sandwich density	
Core density	
Tolerances MD (machine direction), W	
CD (cross direction), L	
Sandwich thickness	
Squareness	

6THPP120CP820

Standard dimensions (CD, L x MD, W)	1.200 mm x 2.500 mm
Sandwich thickness	6 mm
Skin layer thickness	0,5 mm
Core thickness	5 mm
Cell size	4 mm
Weight per unit area	2.400 – 2.460 g/m ²
Sandwich density	400 – 410 kg/m ³
Core density	120 – 130 kg/m ³
Tolerances MD (machine direction), W	+10 / -1 mm
CD (cross direction), L	+2 / -1 mm
Sandwich thickness	+/- 0,3 mm
Squareness	+/- 0,2°

12THPP120CP820

Standard dimensions (CD, L x MD, W)	1.200 mm x 2.500 mm
Sandwich thickness	12 mm
Skin layer thickness	0,5 mm
Core thickness	11 mm
Cell size	5 mm
Weight per unit area	3.120 – 3.240 g/m ²
Sandwich density	260 – 270 kg/m ³
Core density	120 – 130 kg/m ³
Tolerances MD (machine direction), W	+10 / -1 mm
CD (cross direction), L	+2 / -1 mm
Sandwich thickness	+/- 0,3 mm
Squareness	+/- 0,2°

PHYSICAL PROPERTIES

Bending stiffness (CD, L – MD, W)	
Compressive strength (Z-direction) ASTM C365-57	
Compressive modulus (Z-direction) ASTM C365-57	
Shear strength (CD, L – MD, W) ASTM C273-61	
Shear modulus (CD, L – MD, W) ASTM C273-61	
Temperature range for processing and application (°C)	
Thermal conductivity	
Fire-resistance	
Chemical resistance	

Bending stiffness (CD, L – MD, W)	140–125 Nm (at 400 mm span length in 3PB test)
Compressive strength (Z-direction) ASTM C365-57	2,0 MPa (290 Psi)
Compressive modulus (Z-direction) ASTM C365-57	25 MPa (5.800 Psi)
Shear strength (CD, L – MD, W) ASTM C273-61	0,7 MPa – 0,4 MPa (101 Psi – 58 Psi)
Shear modulus (CD, L – MD, W) ASTM C273-61	21 MPa – 6 MPa (3.045 Psi – 870 Psi)
Temperature range for processing and application (°C)	- 30 to +80 short term to +140
Thermal conductivity	0,065 W / mk
Fire-resistance	Normally inflammable (building material class B2 DIN 4102-1, respectively D according to EU classification), higher grades of fire resistance can be obtained in sandwich elements when using specialized skin materials.
Chemical resistance	Excellent resistance to water, most acids, bases and salt solutions.

Bending stiffness (CD, L – MD, W)	590–475 Nm (at 400 mm span length in 3PB test)
Compressive strength (Z-direction) ASTM C365-57	2,0 MPa (290 Psi)
Compressive modulus (Z-direction) ASTM C365-57	45 MPa (5.800 Psi)
Shear strength (CD, L – MD, W) ASTM C273-61	0,7 MPa – 0,4 MPa (101 Psi – 58 Psi)
Shear modulus (CD, L – MD, W) ASTM C273-61	21 MPa – 6 MPa (3.045 Psi – 870 Psi)
Temperature range for processing and application (°C)	- 30 to +80 short term to +140
Thermal conductivity	0,065 W / mk
Fire-resistance	Normally inflammable (building material class B2 DIN 4102-1, respectively D according to EU classification), higher grades of fire resistance can be obtained in sandwich elements when using specialized skin materials.
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