

ROHACELL® WIND-F



Structural foam for wind turbine blades

ROHACELL® WIND-F is a closed-cell rigid foam based on polymethacrylimide (PMI) chemistry, which does not contain any CFC's and is specifically designed to meet the demands of the wind energy industry. It is the most suitable ROHACELL® grade for use as a core material in sandwich structures of wind turbine blades, e.g., skin or spar section.

Benefits of using ROHACELL® WIND-F cores

- Reduced blade mass › lower turbine loads
 - Significantly scales down resin absorption compared to PVC, Balsa and PET cores
 - Lower core density while maintaining mechanical properties
- Decrease in production costs due to shorter cycle times (pre-curing and post-curing)
 - Endures fast, high temperature processes with advanced resin systems
 - Higher mold efficiency
- Enables extended blade lifetime
 - Superior fatigue behavior (WöC > 16)
 - Increase in specific blade stiffness

Processing and production

ROHACELL® WIND-F is compatible with all common epoxy and polyester resin systems and delivers excellent mechanical properties at low foam densities while sustaining continuous process temperatures up to 150°C (302°F).

The mechanical properties at the required density outperform those of other available polymer foams. Even at nominal densities as low as 50 kg/m³, the requirements for core materials can be met by ROHACELL® WIND-F.

Due to the small cell size, resin up-take during manufacturing (e.g., hand-layup, resin infusion process) is optimized compared to other polymer foams or balsa wood. Consequently, the lower resin up-take reduces the weight of wind turbine blades and the manufacturing costs.

With its excellent resistance to high temperatures, processing or curing temperature can be increased significantly to reduce the total cycle time without exothermal issues.

Thermoforming and shaping

For core manufacturing a wide range of shaping and thermoforming processes are possible.

ROHACELL® WIND-F properties

Property		Test method	Unit	ROHACELL® 50 WIND-F	ROHACELL® 60 WIND-F	ROHACELL® 80 WIND-F	ROHACELL® 100 WIND-F
Density		*	kg/m ³	50 ± 8	60 ± 10	80 ± 15	100 ± 20
Shear strength	Nominal	ASTM C 273	MPa	0.8	1.1	1.6	2.1
	Minimum		MPa	0.6	0.8	1.2	1.6
Shear modulus	Nominal	ASTM C 273	MPa	25.9	33.6	49.0	64.4
	Minimum		MPa	19.6	25.8	37.4	48.9
Compressive strength	Nominal	ISO 844	MPa	0.9	1.2	1.9	2.7
	Minimum		MPa	0.5	0.8	1.3	1.9
Compressive modulus	Nominal	ISO 844	MPa	29.9	40.3	61.3	82.3
	Minimum		MPa	21.4	29.8	45.5	61.3
Tensile strength	Nominal	ISO 527-2	MPa	1.5	1.9	2.7	3.5
	Minimum		MPa	1.1	1.4	2.1	2.7
Tensile modulus	Nominal	ISO 527-2	MPa	69.3	88.3	126.2	164.1
	Minimum		MPa	54.1	69.3	97.7	126.2

*Density values are valid for full-size sheets with a minimum thickness of 10 mm (0.39 inch) only. Other density ranges are available upon request

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