

## Product Information

# ROHACELL® Triple F

## IN-MOLD FOAMED CORES FOR GEOMETRICALLY COMPLEX COMPOSITE PARTS

Lightweight design is a key requirement in many industries, with designers today looking to find innovative solutions, like fiber-reinforced plastic (FRP) sandwich construction, for their applications. These FRP composite part designs can be complex and foam cores used in sandwich structures must meet many requirements while still remaining cost- and time-efficient.

With industry established **ROHACELL® Triple F** in-mold foamed (IMF) cores, cost effective manufacture of complex three-dimensional cores for high-volume serial production of FRP composites is now possible.

Even geometries that were previously impossible to create with CNC machining are now quick and easy to produce, since the core is foamed “in situ” – directly inside a mold.

Plus, **ROHACELL® Triple F** offers the potential to lower cost per part through the reduction of waste, manual work and cycle times.

Additionally, **ROHACELL® Triple F** contributes to decreasing resin uptake, resulting in lower resin costs and lower part weight at the same time.

## INTEGRATE COMPONENTS DURING FOAMING

Inserts and other features, such as flow channels, surface texture etc., can be directly integrated during the core foaming process, resulting in a final core part that is ready to be used for lay-up and curing production.

Ready-to-use **ROHACELL® Triple F** foam cores eliminate core preparation time and are quick and simple to use.

## TIME CONSUMING REWORKING AND CONDITIONING – NOT NEEDED!

Fine surface details are accurately reproduced during foaming, so the final core has a smooth surface that provides excellent adhesion to facing layers.

## FAST PROCESSING CYCLES, HIGH VOLUME PRODUCTION

Temperature resistance of up to 130 °C (266 °F) and pressure resistance of up to 3.5 MPa (508 psi) is achievable, depending upon density. Additionally, **ROHACELL® Triple F** is also suitable for most curing conditions used in the aerospace industry which require high compressive creep resistance at curing temperatures up to 180 °C (356 °F) and pressures up to 0.7 MPa (100 psi). **ROHACELL® Triple F** is an ideal foam core for fast and efficient curing processes, not only for RTM or wet pressing, but also for high pressure RTM processes like compression-RTM.

## DENSITY ADJUSTABLE TO YOUR NEEDS

Depending on the mechanical properties required by your production or life service conditions, core density can be adjusted during the foaming process to your choice of a core density between 75 kg/m<sup>3</sup> and 200 kg/m<sup>3</sup> (4.68 lb/ft<sup>3</sup> and 12.5 lbs/ft<sup>3</sup>) – resulting in a ready-to-use shaped core that is customized for your specific application requirements.

## ROHACELL® TRIPLE F FOAM CORES OFFER:

- High volume production at lower per unit production costs
- Freedom of design – for complex geometries
- Function integration – for integrated inserts, custom surface finishes, resin flow channels, etc.
- Tailored and tight density range
- High compression strength and temperature resistance at low density
- Compatibility with fast curing processes
- No hazardous ingredients
- Fire resistance according to DIN 75200 specification

The **ROHACELL® Triple F** particle structure ensures high damage tolerance and is compatible with all common thermosets.

Property	Test Method*	Unit	ROHACELL® 75 Triple F	ROHACELL® 110 Triple F	ROHACELL® 150 Triple F	ROHACELL® 200 Triple F
Density	ISO 845 ASTM D 1622	kg/m <sup>3</sup> lbs/ft <sup>3</sup>	75 4.68	110 6.87	150 9.36	200 12.50
Compressive Strength	ISO 844 ASTM D 1621	MPa psi	1.0 145	1.7 247	2.8 406	4.7 682
Compressive Modulus	ISO 844 ASTM D 1621	MPa psi	64 9,280	117 17,000	172 24,900	229 33,200
Tensile Strength	ISO 527-2 ASTM D 638	MPa psi	1.3 189	1.9 276	2.3 334	2.7 392
Tensile Modulus	ISO 527-2 ASTM D 638	MPa psi	90 13,100	143 20,700	199 28,900	262 38,000
Elongation at Break	ISO 527-2 ASTM D 638	%	1.8	1.7	1.6	1.5
Coefficient of Thermal Expansion		1/K*10E-5	4.5	4.5	4.5	4.5

Technical data values presented above are typical for nominal density, subject to normal manufacturing variations. All data presented is for ROHACELL® Triple F 1-5-X A05 at 23°C if not indicated otherwise. \*: Compressive strength at 3% deformation. Data values are based on ISO standard test methods, however ASTM values can be confirmed upon request.

## INTERESTED IN ROHACELL® TRIPLE F CORES?

Shaped IMF cores, as well as faced sandwich components with an IMF core made of ROHACELL® Triple F, are available worldwide. If you have questions or would like to discuss using a ROHACELL® Triple F core in an application, talk with the ROHACELL® representative in your region.

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