

DESIGNED FOR A GREENER TOMORROW

# ArmaShape

Combines the high mechanical properties of structural foam core with the advantages of particle foams to offer lightweight and strong three-dimensional foam parts which are producible in nearly any shape.

[www.armacell-core-foams.com](http://www.armacell-core-foams.com)

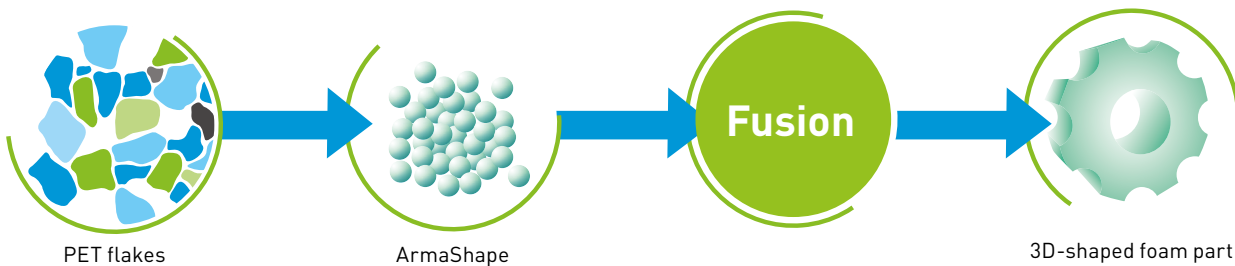


 **armacell**<sup>®</sup>  
ArmaShape

## FIRST PET-BASED PARTICLE FOAM

# ArmaShape

At Armacell, we demonstrate continuous development and driving innovation. We are proud of our recent innovation – the first mouldable particle foam based on PET. It is designed to be used in large-scale production of ready-to-use 3D shaped foam cores for composite sandwich structures. This is our solution for cost-effective serial production of structural composite parts at highest design flexibility and sustainable responsibility.



Starting from recycled PET flakes (recycled PET bottles), the polymer is granulated and further processed by Armacell's patented technology to produce ArmaShape. The loose PET beads are then filled into a mould and fused by a newly developed technology into the finished part.

ArmaShape combines the high mechanical properties of structural core foams with the advantages of particle foams, offering lightweight and strong three-dimensional foam parts which are producible in nearly any shape.

### Cost-effective manufacturing of complex 3D shaped foam parts for serial production:

- // Foaming directly inside the mould
- // No milling and cutting
- // Virtually waste-free production
- // Reduced production complexity

## Temperature stability of ArmaShape reduces cycle times

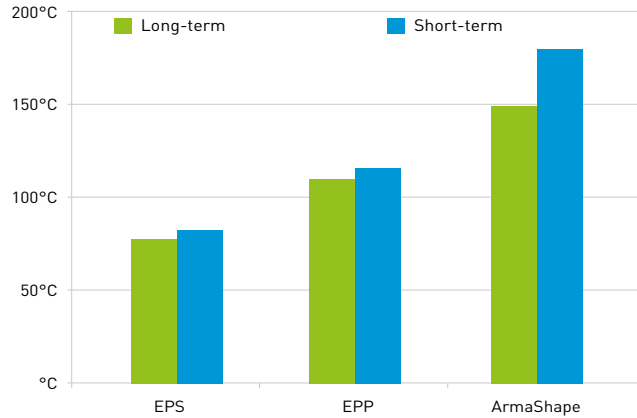
PET has a melting point of 240-250°C / 464-482°F allowing for a wide range of processing temperatures. A temperature of +150°C / +302°F allows for long-term processing of PET foams. At elevated temperatures of e.g. +180°C / +356°F, processing is accomplished within a couple of hours.

**ArmaShape is the ideal material for fast curing processes at high processing temperatures.**

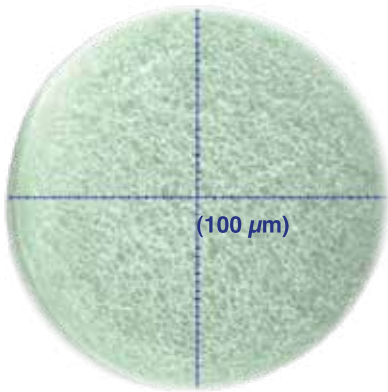
At room temperature:



After 30 minutes at 180°C:



## Microcellular closed cell structure

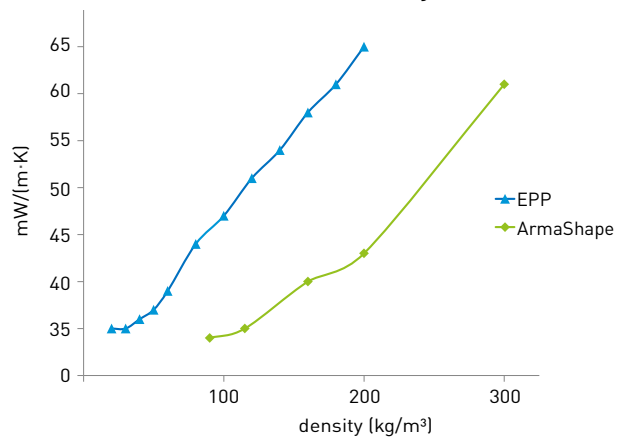


The fine and smooth surface structure of ArmaShape moulded foam parts provides an excellent bond to facing layers and limits resin uptake without additional treatment or the need of extra layers.

The use of ArmaShape particle foams allows for reduced cost and weight of the finished part. ArmaShape is compatible with all common resin systems and thermoset materials.

Water or liquid ingress is prevented by the closed cell structure which ensures unchanged high mechanical properties (compression & shear) over time. Further more, ArmaShape moulded foam parts exhibit very good insulation properties:

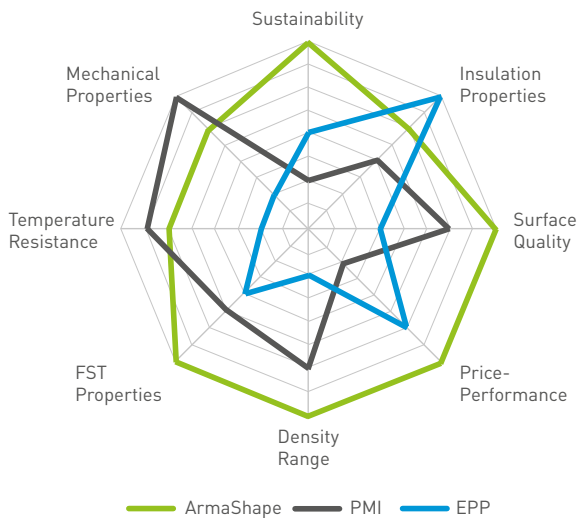
### Thermal Conductivity at 23°C



## Technical data (preliminary)

Today, ArmaShape allows the production of foam parts with densities from 70 – 300 kg/m<sup>3</sup> to cover different needs of mechanical properties during production or life service conditions. Customized fire properties are possible.

			ArmaShape 90	ArmaShape 115	ArmaShape 160	ArmaShape 200	
<b>Density Moulded Part</b>	<b>ISO 845</b>	kg/m <sup>3</sup>	90	115	160	200	Tolerances: +/- 15%
		lb/ft <sup>3</sup>	5.6	7.2	10.0	12.5	
<b>Compression Strength (25% deformation)</b>	<b>ISO 844</b>	MPa	0.45	0.65	1.2	1.6	
		psi	65	95	175	230	
<b>Compression Modulus</b>	<b>ISO 1922</b>	MPa	7	10	16	22	
		psi	1,015	1,450	2,320	3,190	
<b>Thermal Conductivity</b>	<b>at 23 °C</b>	W/(m·K)	0.034	0.035	0.042	0.043	
		<b>at 73.4 °F</b>	BTU.in/ FT <sup>2</sup> .hr.°F	0.236	0.243	0.291	
<b>Cell Diameter</b>		µm	< 500	< 500	< 500	< 500	



## Primary benefits

- // High mechanical properties
- // Superior temperature resistance
- // Tailored fire properties
- // Good resistance to chemicals & oils
- // Closed-cell structure
- // Good insulation properties
- // No outgassing
- // Made from 100% recycled PET
- // 100% recyclable after use-phase

## Application

ArmaShape targets large volume applications in many industries, where lightweight yet strong plastic parts are prerequisites for a successful product design. Among these the automotive industry, where ArmaShape is designed for applications like car bodies chassis and structural add-on parts.

lightweight  
&  
strong

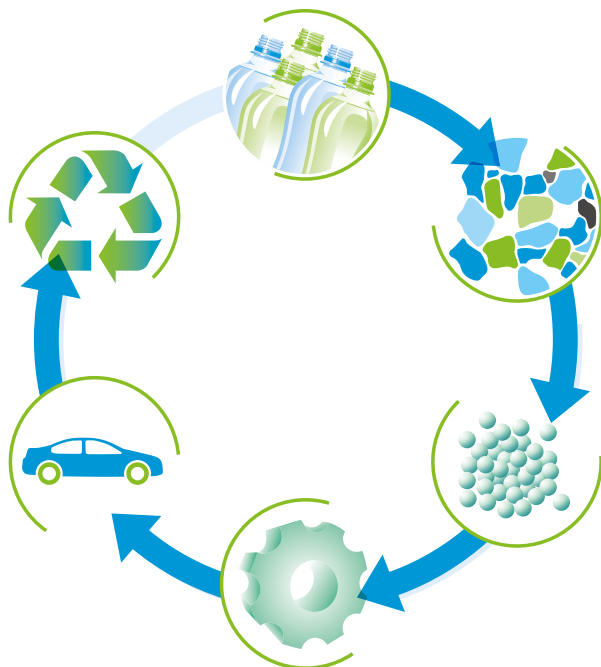
cost-effective  
serial  
production

# FROM A BOTTLE TO A GENUINE PET FOAM



At Armacell, our vision has always been to create innovative technical solutions. We have spent years of intensive research to develop a benchmark process technology that enables production of consistent foam qualities from 100% post-consumer PET, more precisely from recycled beverage bottles. Instead of being landfilled or incinerated, the recycled PET returns to the system, and thanks to Armacell's patented technology, are remanufactured into a full value product.

Armacell has underlined its technical leadership in PET foam technology with a series of pioneering innovations: with the market introduction of ArmaForm® Core, our structural foam cores, Armacell paved the way for PET foam cores in the composite industry. This was followed by ArmaForm® Foil, the first 100% recyclable thermoplastic foil product, for thermoforming application. ArmaShape is a continuation of this success.



In addition to its sustainable raw material base, ArmaShape is manufactured and processed in an eco-friendly manner without using CFCs or HCFCs.

Furthermore, grades with tailored fire retardancy characteristics have been developed which employ the newest generation of halogen-free flame retardants. Made from 100% recycled PET and recyclable again after their use phase,

ArmaShape follows the guidelines for circular economy and helps to preserve and enhance the environment.



All data and technical information are based on results achieved under typical application conditions. It is the customer's responsibility to verify if the product is suitable for the intended application. The responsibility for professional and correct installation and compliance with relevant building regulations lies with the customer. By ordering/receiving product you accept the **Armacell General Terms and Conditions of Sale** applicable in the region. Please request a copy if you have not received these.

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## ABOUT ARMACELL

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As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,000 employees and 27 production plants in 17 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.

For more product information, please visit:  
[www.armacell-core-foams.com](http://www.armacell-core-foams.com)

