

DESIGNED FOR A CLEANER TOMORROW

# From bottle to foam

Armacell offers a wide range of eco-friendly, lightweight materials for structural core and insulation applications based on 100% recycled polyethylene terephthalate (PET). From a throw-away bottle to lasting value we are making a difference around the world.

[www.armacell.com/OneBillionBottles](http://www.armacell.com/OneBillionBottles)



**armacell**<sup>®</sup>

MAKING A DIFFERENCE AROUND THE WORLD

## FROM AN EMPTY BOTTLE TO A HIGH-TECH FOAM

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The impact of plastic on our ecosystem is undisputed. Every second more than 16,000 plastic bottles are sold worldwide. Less than 50% of these bottles are collected for recycling, and only 7% go to make new PET bottles. The majority of plastic bottles ends up in a landfill or our environment, where plastic takes hundreds of years to decompose.

Now is the time to encourage innovative entrepreneurship in production methods and product solutions designed to boost sustainability and the circular economy. The latter involves switching from a linear 'make-take-dispose' economy to a circular model based on 'reduce, reuse and recycle'. An economy in which waste and pollution are designed out, products and materials are kept in use longer and natural systems regenerated. Both the UN and the EU have launched circular economy initiatives. This macro level effort is being matched by initiatives at the micro level of companies, NGOs and citizen action groups.

» As a company processing plastic, we have a clear responsibility to play our part in accelerating the transition to a circular economy. «

Bart Janssen, Vice President Engineered Foams

Today, we are recycling PET from plastic bottles, discovering and analysing new sources of recycled PET and maximising the collection of internal scrap, which is returned to the production process.

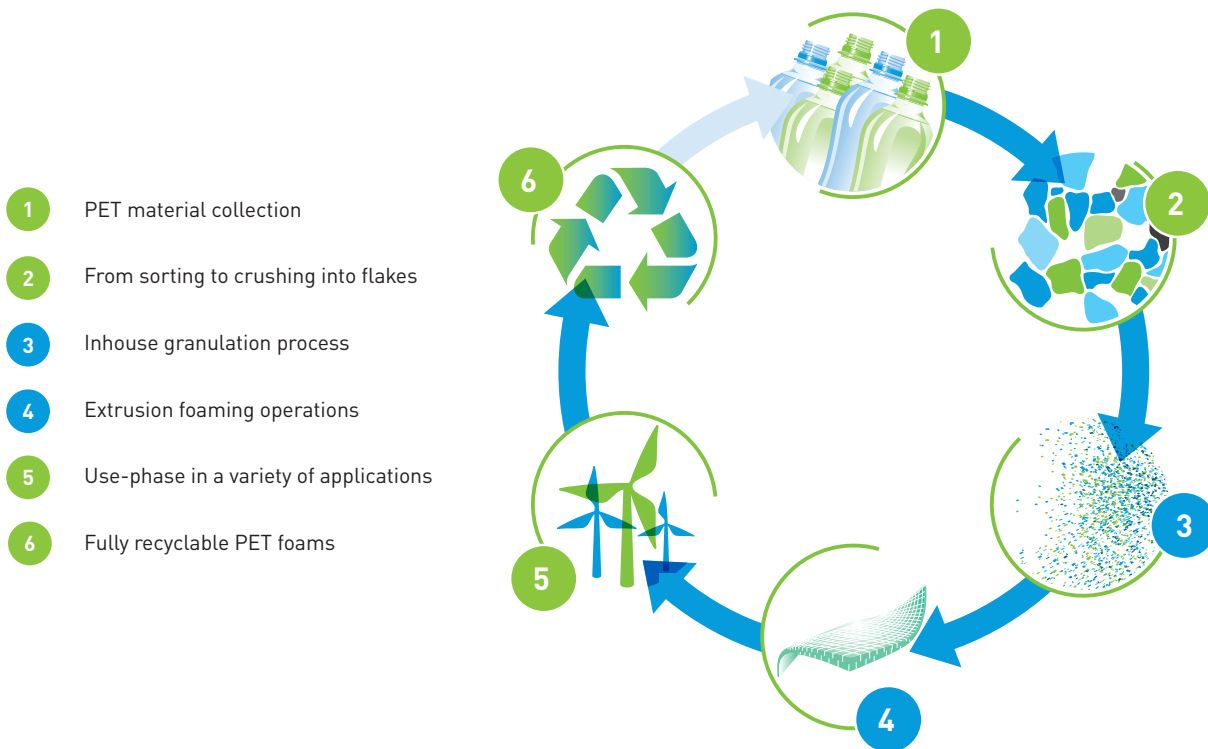


## CLOSING THE LOOP

Armacell is the pioneer in the field of polyethylene terephthalate (PET) technology and initiated the breakthrough of PET foams as a structural core material in the composite industry. In the early days, our PET foams were made from virgin PET. Over the past decade, our global research and development team developed a process technology enabling the production of PET foam products made entirely from recycled beverage bottles.

### THE ECO CIRCLE

During the post-consumer life-cycle of the plastic bottle, Armacell focuses on the reprocessing:



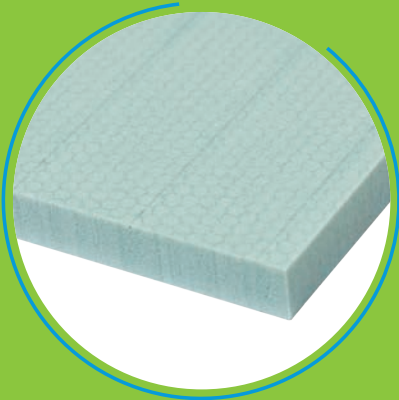
» We convert single-use recycled PET bottles into long-lifetime, high-value foam core materials for composite sandwich structures utilised in up to 90-metre-long wind turbine blades, high-speed train body structures, surfboards, as well as on the 24-karat gilded roof of an orthodox cathedral. «

Thomas Kessel, General Manager PET Foams



## PET FOAMS - PORTFOLIO

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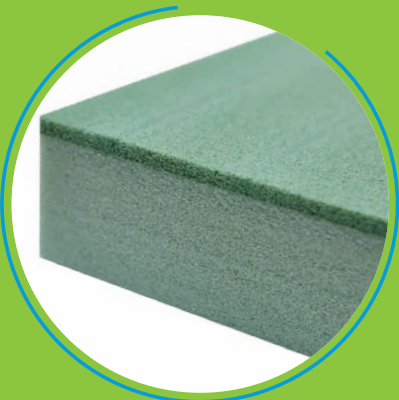


### ArmaForm® Core

structural foam cores provide a unique combination of material and processing properties, such as a high strength-to-weight ratio, durability, superior service temperature stability and excellent compatibility with most common resins and manufacturing methods.

### ArmaForm® Foil

is the first fully recyclable and thermoformable thermoplastic foil product designed to provide a sustainable and improved alternative to cross-linked polyethylene (XLPE) and polypropylene (XLPP) products in mainly thermoforming applications.



### ArmaForm® MultiCore

combines different densities in one foam core to improve impact and point load resistance while minimising weight. Designed to replace conventional plywood-XPS and other multi-ply panels.

### ArmaForm® Eco

low density foam board for structural insulation panels combining long-term insulation and structural integrity with process versatility.

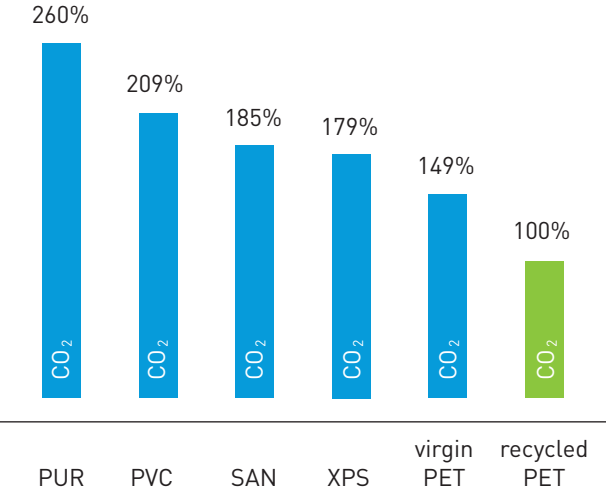


### ArmaShape

loose beads are utilised for manufacturing lightweight and strong 3D shaped foam cores for composite sandwich structures. Used as a loose filler grade, it is a high performance alternative to conventional materials with superior compression strength and temperature resistance.

# PET FOAMS - ECO BALANCE

Using 100% recycled PET as a raw material base for our PET foam products delivers significant CO<sub>2</sub> emission savings:

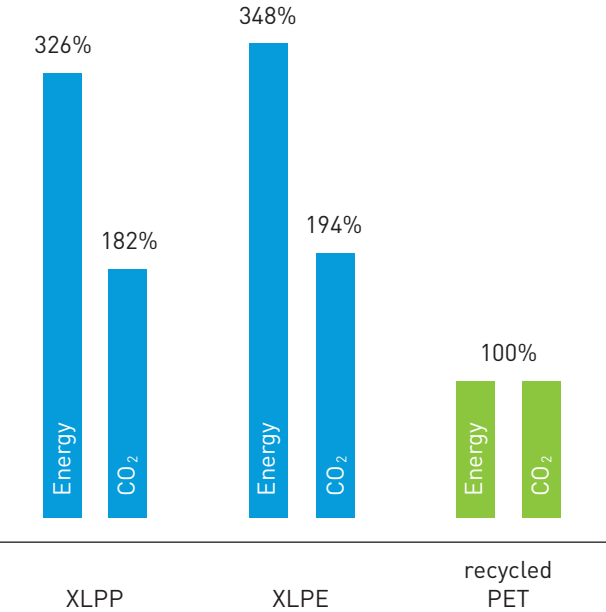


PUR Polyurethane  
 PVC Polyvinyl Chloride  
 SAN Styrene Acrylonitrile  
 XPS Extruded Polystyrene

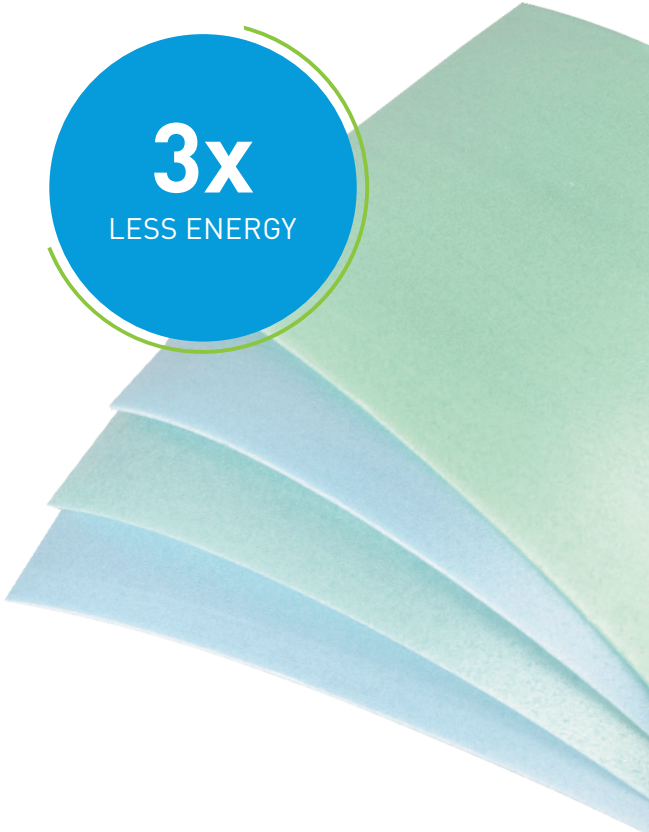
**>33%**  
 CO<sub>2</sub> EMISSION  
 SAVINGS



To manufacture ArmaForm Foil, three times less energy is required than to produce comparable XPE and XPP foil products.



**3x**  
 LESS ENERGY



## OPERATIONAL EXCELLENCE

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All our products are manufactured in an energy- and resource-efficient production process.

We only use halogen-free, flame retarded additives. 100% of production scrap is returned to the process and re-used for foam manufacturing.



## FROM THROW-AWAY TO SUSTAINABLE VALUE

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Over the past decades, fibre-reinforced composites have proven their worth as weight-saving structures that deliver energy efficiency, durability, functionality and cost effectiveness over the long term. In transportation applications, for example, fibre-reinforced composite sandwich panels are utilised to lower weight. Less weight on a train, boat, bus or anything else that moves is directly correlated to higher energy efficiency. The lighter a vehicle is, the less energy consumed.

Today, the sustainability of the individual component is becoming a compelling argument in the materials selection process. The trend of designing environmentally-friendly composite structures which are light, strong and recyclable has led industrial designers, specifiers and composite manufacturers to accelerate the substitution of conventional core materials such as Balsa, SAN, PUR or PVC with our PET foam cores.

» Adoption rates of our ArmaForm product suite are growing globally across our key end markets including wind energy, transportation, building & construction and industrial. «

Henri Chapelle, Sales & Marketing Manager PET Foams

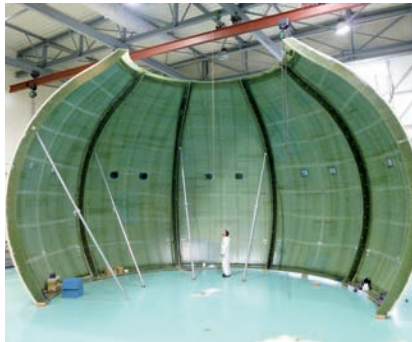
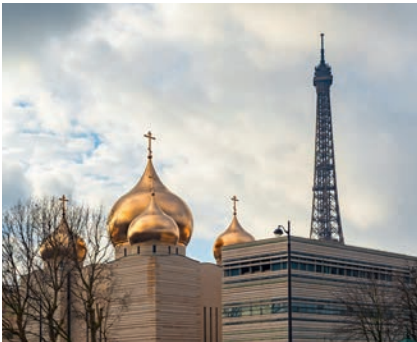
# PET FOAMS IN ACTION



**YOU CAN FIND OUR STRUCTURAL PET FOAM CORES IN VARIOUS CONSTRUCTIONS AND ICONIC PROJECTS AROUND THE WORLD.**

// Sandwich constructions for rotor blades, nacelles and spinners of wind turbine application.

ARMAFORM  
USED IN  
**100,000**  
ROTOR BLADES  
GLOBALLY



// Five gilded domes of the Russian Orthodox Cathedral in Paris, France. The domes were manufactured off-site and it took 15 minutes to put the largest dome, spanning 12 metres in diameter, in place by crane.



// Façade cladding of King Abdullah KAFD World Trade Centre in Riyadh, Saudi Arabia. It covers a surface area of more than 40,000m<sup>2</sup>. It is the second tallest tower in the area with an observation deck open for public at a height of 300 metres.



// Nose of the CRH3A bullet train that connects the 700km distant cities of Chengdu and Xi'an in Western China in less than four hours. The success of the CRH3A has put an end to flights between the two cities, thus reducing the carbon footprint on this route.



## CONNECTING THE FLAKES

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» Opening our unique and patented process technology to others leverages Armacell's contribution to a greener tomorrow. «

Dr. Justyna Dolega, Global Innovation Manager

We are proud to have used more than one billion recycled PET bottles in our production so far. Going forward, we will create partnerships and enter global networks to increase our efforts.

Armacell is participating in the EU-funded PlastiCircle project as a research partner. PlastiCircle aims to improve plastic packaging waste collection, transport, sorting and recycling rates across Europe. By enhancing the plastic packaging waste chain through a circular economy approach, PlastiCircle is striving to reinvent the plastic packaging treatment process and transform waste into valuable products. Besides our own research in this field, we are using the PlastiCircle network to find new opportunities for post-consumer PET sourcing and its conversion into full-value products.

We are a partner of the Operation Clean Sweep® initiative, a global product stewardship programme to drive best practices in plastic material loss management. The programme encourages plastic processing companies to improve their worksite set-up for plastic pellet prevention and achieve zero material loss. The unintentional loss of plastic pellets, flakes or powders can occur at all stages along the foam manufacturing process, including raw material handling, production, storage and transportation. If not contained or disposed of properly, microplastics may end up being washed down drains and into groundwater before eventually flowing into the ocean. Among many initiatives, Armacell sets internal procedures to achieve zero material loss, provides employee training and encourages accountability for responsible waste handling.

Another way of contributing to higher recycling rates beyond our own production is to share our technology with others. Armacell is granting licenses to other PET foam producers in the composite industry to adapt and operate our patented process technology in their manufacturing.





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## RECYCLED PET BOTTLES USED IN OUR PRODUCTION

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At Armacell we constantly innovate, improve and rethink what we are doing and are focused on sustainable, profitable growth through the development and manufacturing of our products to ensure a positive impact on our community.

Decades of research and development, as well as our experience, have made us what we are today: the leading innovator in PET foam technology and a pioneer in sustainability.

» Our unique PET foam products meet the stringent technical requirements of today's composite core materials and follow the circular economy guidelines to preserve our environment. Leadership to us is all about caring and assuming responsibility. «

Patrick Mathieu, President & CEO

## ABOUT US

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Armacell is the inventor of flexible elastomeric foams for equipment insulation. We develop innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for our customers. Day in, day out, our products make a significant difference around the world. As a multi-material and multi-product company, we operate two main businesses: Advanced Insulation and Engineered Foams. Our product focus is on insulation materials enhancing the energy efficiency of technical equipment, high-performance foams for sophisticated and lightweight applications, 100% recycled PET products and next-generation aerogel technology.



### // Passionate

Dedicated and professionally-minded employees with an entrepreneurial spirit are our greatest asset. They share a common set of core values: customer experience, commitment, empowerment and accountability, integrity and sustainability.

**3,054**

employees worldwide  
representing 70 different  
nationalities

**24**

production facilities  
in 16 countries on  
4 continents

**+100**

countries where  
customers are  
served





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 more than 3,000 employees and 24 production plants in 16 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 information, please visit:  
[www.armacell.com](http://www.armacell.com)

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

  
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