

DESIGNED FOR A CLEANER TOMORROW

FROM BOTTLE TO FOAM

Armacell offers a wide range of innovative eco-friendly PET foam solutions for structural and insulation applications based on 100% recycled PET. From a throw-away bottle to lasting value we are making a difference around the world.

www.armacell-core-foams.com



 **armacell**[®]
MAKING A DIFFERENCE AROUND THE WORLD

FROM AN EMPTY BOTTLE TO A HIGH-TECH FOAM



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.

IN THE ECO CYCLE

Armacell is a 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 (2005). But our research did not stop there; as a technology leader, Armacell went on to further developed its unique and patented rPET process technology that enables PET foam products to be made entirely from recycled beverage bottles (2010). Today, Armacell offers a diverse product portfolio of environmentally friendly solutions based on 100% recycled PET: structural foam cores, thermoformable flexible sheets and particle foams.

In the post-consumer life cycle of a plastic bottle Armacell's reprocessing technology creates a virtuous eco cycle. After collection, the PET bottles are sorted and crushed into flakes. This is followed by an in-house granulation process and, finally, extrusion foaming.

1. PET bottles
2. rPET flakes
3. Inhouse granulation
4. Extrusion foaming
5. Use-phase
6. Recyclable PET foams
The entire ArmaPET portfolio is 100% recyclable

PUTTING PLASTIC WASTE TO GOOD USE



» We convert 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

ARMAPET® - PORTFOLIO

Our ArmaPET family consist of innovative eco-friendly product solutions featuring our unique rPET technology with lowest ecological footprints. ArmaPET products enhance efficiency throughout the manufacturing process and elevate the life cycle performance of your composite structure.

ArmaPET Struct

is the versatile and durable solution for structural sandwich applications, with a more environmentally responsible approach.

ArmaPET Eco

combines insulation and structural integrity, ensuring energy and emission efficiency for decades of use.

ArmaPET Curve

is designed for recyclable thermoformable micro sandwich solutions produced in continuous manufacturing processes.

ArmaPET Shape

particle foam offers maximum design flexibility to produce lightweight rigid 3D foam parts using innovative fusion technology.

» Our unique ArmaPET 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. «

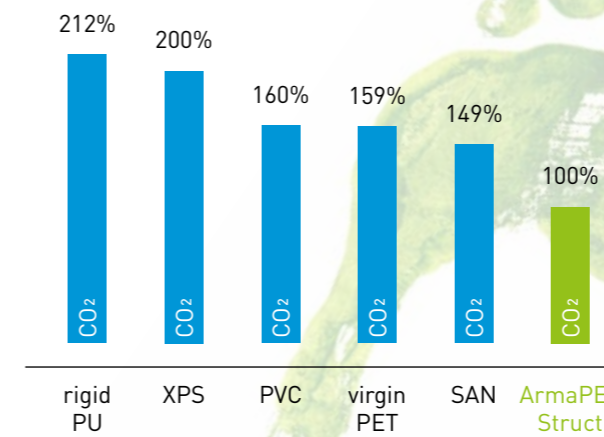
Patrick Mathieu, President & CEO

ARMAPET – CARBON FOOTPRINT

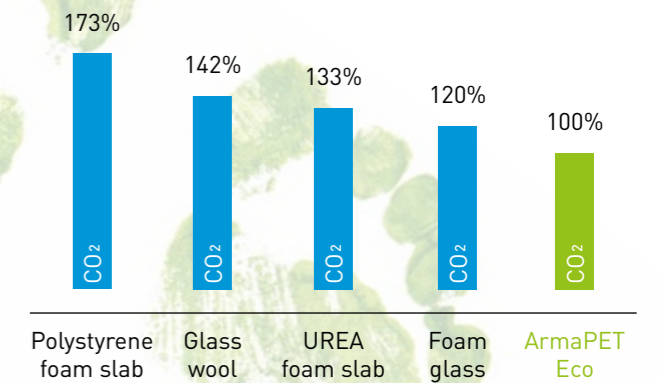
The most important environmental indicator, global warming (GWP100a), is commonly known as the **carbon footprint**. A carbon footprint is the amount of greenhouse gases — primarily carbon dioxide — released into the atmosphere by a particular human activity (such as a product's manufacture and transport). It is usually **measured as tonnes of CO₂** and is the assessment of the **product's global warming potential**.

Using 100% recycled PET as the raw material base for the ArmaPET product family delivers significant CO₂ emission savings compared to its main competitive materials currently on the market.

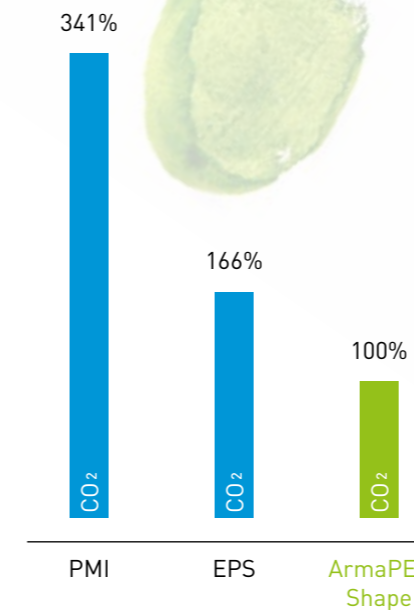
ArmaPET Struct



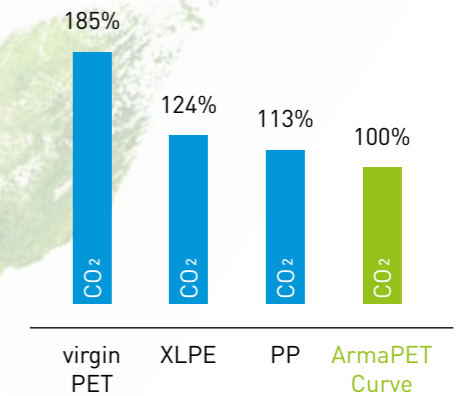
ArmaPET Eco



ArmaPET Shape



ArmaPET Curve



CO₂ emissions of ArmaPET products in comparison to competitive materials. ArmaPET = 100% reference.

OPERATIONAL EXCELLENCE

All ArmaPET 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

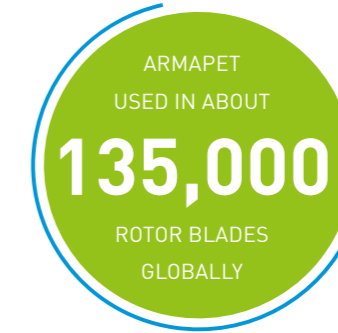
Over the past decades, fibre-reinforced composites have proven their worth as weight-saving structures that deliver energy efficiency, durability, functionality and cost effectiveness over the long term. In transportation applications, for example, fibre-reinforced composite sandwich panels are utilised 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 ArmaPET.

» Adoption rates of our ArmaPET 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

ARMAPET IN ACTION



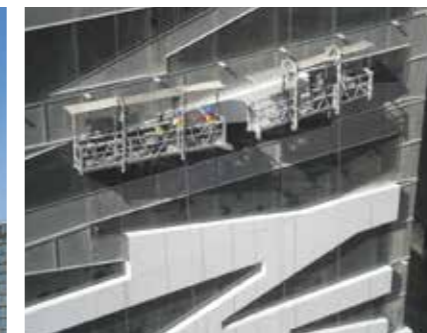
YOU CAN FIND ARMAPET IN VARIOUS CONSTRUCTIONS AND ICONIC PROJECTS AROUND THE WORLD.



// Eco-friendly house in Nova Scotia, Canada. The 186 square metres prototype bungalow consists of 170 ArmaPET cored SIPs and was assembled in just 14 hours. 612,000 recycled PET bottles brought this eco house to life.



// 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 Center in Riyadh, Saudi Arabia. It covers a surface area of more than 40,000 square metres. 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 700 kilometres 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

» 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 1,7 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.



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.

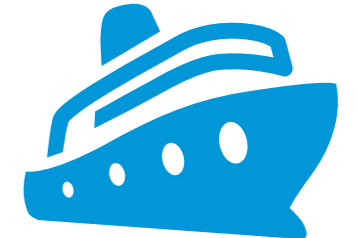
Over the past decade, Armacell's rPET facilities have reused over 1,700,000,000 PET bottles and **saved more than 76,800 metric tonnes of CO₂ emissions in the process.** That is equivalent to the emissions of ...



Brussels - New York:
One way, Economy,
approx. 5,900 km,
1 traveller



Mid-sized car running
20,000 km per year:
Medium consumption of
6.0 l / 100 km, diesel oil



10 days cruise:
Cruise liner,
1 passenger



Route 66 trip by motorbike:
>500 ccm, 1 passenger,
Chicago to Santa Monica
(approx. 3945 km)



ABOUT US

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.



+3,000

employees worldwide representing 70 different nationalities

23

production facilities in 15 countries on 4 continents

+100

countries where customers are served



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ABOUT ARMACELL

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 23 production plants in 15 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 company information, please visit:
www.armacell.com

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