

CASE STUDY

DOMES

Russian Orthodox Cathedral

ArmaPET™ Struct was used in the five golden domes of the Russian Orthodox Cathedral, in Paris. Manufactured off-site and transported over 500 km, the domes were raised into place by crane. **Armacell in action.**

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MAKING A DIFFERENCE AROUND THE WORLD

ArmaPET™ tops the Russian Orthodox Cathedral in Paris

The Russian Orthodox Cathedral is a Paris landmark. Designed by Jean-Michel Wilmotte, one of the world's best-known contemporary architects, this centre of spiritual and cultural life is only a few hundred metres from the Eiffel Tower. Five eye-catching golden onion domes crown the cathedral, which combines traditional ecclesiastical architecture with the needs of a modern cultural-religious centre.

By providing ArmaPET Struct to core the five domes, Armacell played its part in realising Jean-Michel Wilmotte's iconic design. ArmaPET Struct offers superior mechanical and tensile strength, residual flexibility and excellent fatigue properties in combination with low thermal conductivity, all decisive factors in realising the project.

Traditionally, onion domes consist of a timber or metal framework covered with leaves of gilded copper, slate or ceramic. For this cathedral, however, architect Jean-Michel Wilmotte wanted to create smooth domes, rather than faceted, a finish that is difficult to produce according to Louis Lafargue, Project Director at Wilmotte & Associés: 'We wanted something quite monolithic, without joints, like abstract scale

objects placed on the building, with huge, very smooth modules. And these domes go from concave to convex, which complicated things even more.'



Russian Orthodox Cathedral & Cultural Centre, Paris

Domes manufactured 500 km away

In contrast to conventional construction techniques, the choice of a composite dome solution had two major aspects. Cored with ArmaPET Struct, the weight of the bigger dome was reduced by a factor five, from 42 tonnes to 8 tonnes. The domes' reduced weight

allowed for less supporting structures and facilitated, as well as, speeded up handling during assembly. It took only 15 minutes (!) to put the bigger dome of 12 x 12 metres by crane in place.

The domes were produced off-site at Multiplast's factory in Vannes, France, approximately 500 km from Paris, which made the project quite unique: the production of the domes was begun even before the building's foundation was completed, and thus the project schedule could be considerably shortened.



©Multiplast: panels cored with ArmaPET Struct GR80 in 50 mm

The surface coating with around 86,000 leaves of 24-karat gold was easier to apply inside the production hall than at 50 metres height, not to mention, possible climatic challenges in the open air which are impossible to control over a period of three months.



©Multiplast: test assembly before gilding and transportation

To manage transportation to Paris, the big dome was produced in 14 pieces and the smaller ones in five pieces each. After assembly on the ground, on-site, they were lifted by crane. ■

Project: Composite dome structure

Location: Russian Orthodox Spiritual & Cultural Centre, Paris

Owner: The Russian Federation

Architect: Wilmotte & Associés

General contractor: Bouygues Bâtiment Ile-de-France

Contractor domes: Multiplast

Timeline: Start of construction 07/2014. Raising of the central dome 03/2016.

Domes

Central dome: 8 metric tonnes; height 12 m

Small domes: 2 metric tonnes; height 6 m

50 mm thick composite sandwich structure cored with ArmaPET™ Struct, at a density of 80 kg/m³ with grid-score finishing, and reinforced with glass fibre/epoxy resin skins by a vacuum infusion process.

1,500,000,000 RECYCLED PET BOTTLES USED IN OUR PRODUCTION

Armacell developed a process technology enabling the production of PET foams entirely based on recycled beverage bottles. We convert single-use recycled PET bottles into long-lifetime, high-value foam core materials for composite sandwich structures utilised in various constructions and iconic projects around the world like the Russian Orthodox Cathedral in Paris.

From a throw-away bottle to lasting value, we are making a difference around the world.

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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 3,135 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.

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