

## Construction: innovating to reduce the energy cost of buildings



**The construction industry is faced with ambitious sustainable development objectives. The Arkema group is present in the construction market and offers innovative and competitive solutions to improve the quality of construction materials and the energy performance of buildings.**

Actions taken to fight global warming place great focus on the construction sector. Present in the construction market, the Arkema group provides sustainable solutions for the **insulation** of buildings and also for the **manufacturing of materials** which are more resistant and have a lower energy cost.

### Windows with better insulation

Windows are one of the main weak points of thermal insulation in buildings. The Arkema group has developed innovative solutions which contribute to the manufacturing of high performance, double-glazed windows.



- Controlling solar radiation: when treated with **Certincoat®**, glass window surfaces limit the thermal exchange between the interior and exterior due to a better reflection of solar radiation. The temperature inside the building is more stable and energy costs are reduced by 30%.
- Enhancing the efficiency of double-glazed windows: the **Siliporite®** molecular sieves are used in the aluminum frames placed between the two window panes in order to “capture” the condensation. This technology keeps the air in the double-glazing perfectly dry. As a result, insulation efficiency is increased, and the quality of the window is extended several years.
- Optimizing the quality of PVC window profiles: **Durastrength®** and **Clearstrength®** additives respectively provide PVC profiles with impact resistance and UV resistance. These additives extend the quality of the frame structures. **Plastistrength®**, an acrylic process aid, enhances even the most rigid PVC formulation, which is used for the extrusion of the profiles.

In addition, the **Altuglas® acrylic sheet** are very appreciated by architects for domes, skylights, tunnels, cupolas, windows, etc. These low density and sustainable products are resistant to bad weather conditions and exhibit **excellent light transmission properties**. They are also easy to bend, cut, thermoform, tint, etc.

### Effective foams for insulating walls

For the thermal and sound insulation of walls, the Arkema group provides Forane®, an expansion agent for rigid polyurethane foams, the most widely used in the market. The new generation Forane® is based on hydrofluorolefins (HFOs) and has no impact on global warming.

### Kynar Aquatec® : an energy efficient roof coating

PVDF Kynar 500® is a reference for the coating of **metal structures** used in architectural buildings. It is recognized for its remarkable resistance to dirt pick up, bad weather conditions, UV radiation and for its reflective properties. This coating is prepared in a plant as it requires a **stove-lacquering process**.

The Arkema group succeeded in developing a PVDF grade of **acrylic emulsion** for water-based paint. It can be applied on any type of roof (synthetic membrane, cement, bitumen) using conventional tools and presents exceptional PVDF **durability**. Twice as durable as acrylic-based paint, Kynar Aquatec® -based paint is ideally suited to “**cool roofing**”, a white roof concept which reflects UV rays. By limiting the heating up of a building and by reducing the use of air conditioning, **energy performance** can be improved by nearly 15% over 20 years.

Product features of Kynar Aquatec®

### Additives to reduce the environmental cost and impact of materials

**Coatex**, a subsidiary of the Arkema group, constantly innovates in order to develop higher performance materials, which are less costly and which consume less energy. Its range of Ethacryl™ dispersants and water-reducing agents for cement and plaster reduce the consumption of water and raw materials. As a result, **energy costs and the carbon footprint** for manufacturers are reduced. To optimize the drying of concrete, **Sartomer**, another subsidiary of the Arkema group, produces specific acrylics for concrete additives.

Finally, **Ceca**, another Arkema group subsidiary, has developed a surfactant-based additive for **asphalt mixes** which is composed of 50% renewable raw materials. Small quantities are added to the bitumen/aggregate mix, thereby reducing the **application temperature** of the asphalt by about 50°C. Consequently, the amount of energy required to heat and spread the asphalt is reduced by 20 to 50% and dust emission by 90%. The result is that the impact on the environment is lessened and working conditions improved.

### Cecabase® RT: the environmental impact of warm asphalt mix

Using Ceca surfactants for all European warm asphalt mix projects could represent an annual **fuel savings of 700,000 tons**, the equivalent of the annual heating needs of a town such as Marseille, France.

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Product features of Cecabase® RT warm asphalt mix

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