

FUNCTIONAL POLYOLEFINS

LET'S PROGRESS TOGETHER



Markets
where we help you

About us

A global chemical player, Arkema consists of 3 coherent and related business segments: Vinyl Products, Industrial Chemicals, and Performance Products. Present in over 40 countries with 17,000 employees, Arkema achieved sales of 5.7 billion euros in 2006. With its 6 research centers in France, the United States and Japan, and internationally recognized brands, Arkema holds leadership positions in its principal markets.



FUNCTIONAL POLYOLEFINS

As an important part of the Technical Polymers activities of Arkema, **Functional Polyolefins** has been growing together with its customers by providing innovative high performance solutions, and reliable technical service, as well as offering local support around the world. Arkema **Functional Polyolefins**, one of the worldwide leaders, is well recognized in various markets and applications, such as wire and cable, packaging, hot-melt adhesives, automotive, polymer modification and construction.

Benefiting from its knowledgeable and dynamic business development team worldwide, and its efficient research facilities, Arkema **Functional Polyolefins** stands as a unique partner to its customers who expect a vast array of innovative solutions to the most complex problems they encounter.

Relying on the Arkema network, **Functional Polyolefins** is present all over the world. Growing markets in Asia, Latin America and Eastern Europe have provided room for **Functional Polyolefins** to expand even further.

Our brands

EVATANE®

EVA copolymers

LOTRYL®

Ethylene-acrylate copolymers

LOTADER®

Ethylene-acrylate terpolymers

OREVAC®

Grafted polyolefins

SOARNOL® *(marketed in Europe)*

Ethylene-vinyl alcohol (EVOH) copolymers



Coextruded films, sheets and bottles

Do you use coextrusion techniques in your industrial processes? Arkema Functional Polyolefins has developed a broad range of adhesive resins that can meet your every need. With their excellent adhesive properties, OREVAC® resins are used in the production of multi-layer structures that combine the performance of a polyolefin (mechanical resistance, sealing or water barrier properties) with that of an oxygen barrier material such as polyamide or EVOH, a product that is highly prized in the packaging industry.

LOTRYL® is often used as polyolefin sealing layers. Films are used for vacuum-pack bags (meats, prepared foods, fish, cheese, coffee, etc.), cooking bags (ham), sachets for sauces (mustard, ketchup, etc.) and for medical bags.

Sheets are used to produce and thermoformed trays to package salads, prepared foods and fresh pasta. Multi-layer bottles OREVAC® polymers as tie-layer are ideal for the packaging of fruit juices, vitamin-enriched milk, chemical products and pesticides.



Packaging



Extrusion coating lamination

The outstanding ability to adhere to different substrates makes LOTADER® and OREVAC® adhesive resins the preferred tie-layers used in barrier structures made by extrusion coating or extrusion lamination processes.

These can combine cardboard, aluminium foil, metallised plastic films, or plain plastic films, such as OPA, OPET and BOPP.

LOTRYL®, with proven performance in seal-peel applications, helps in designing sealable-peelable structures that are typically used in lids for trays and pots or bags for coffee and snacks.



Hot-melt

Hot-melt technology has captured a significant portion of the global adhesives business in different areas such as packaging, bookbinding, woodworking, etc.

Arkema Functional Polyolefins has developed a wide range of thermoplastic copolymers to fulfill the growing requirements of its customers.

Due to its high compatibility with tackifying resins and fillers together with its formulating capacity, EVATANE® EVA is the largest resin type used in the hot-melt industry.

Hot-melt adhesives



LOTRYL® EMA and EBA grades have been developed over the past ten years for the hot-melt industry.

The improved thermal properties of these acrylate copolymers have been promoted in various applications, such as deep freeze packaging, book-binding and film lamination.

New LOTRYL® acrylate copolymers were recently launched in order to further improve thermal properties (especially in deep freeze applications) as well as thermal stability of the hot-melts. Thanks to their high fluidity, LOTRYL® EH grades are well suited for “cool melt” formulations.

Benefiting from their reactive groups, OREVAC® and LOTADER® terpolymers are widely used when adhesion improvement or crosslinked systems are required to obtain a high performance adhesive.



Impact modifiers for engineering plastics

Temperature resistant thermoplastics (for example PA, PBT, PET and PC/PBT alloys) are more widely used in the automotive, electrical & electronic industries. Significant parts of these markets need improved impact resistance.

Ethylene copolymers with high comonomer content and therefore good elastomeric behaviour can be successfully used as impact modifiers.

LOTADER® MAH grades give excellent performance in modifying polyamides ranging from flexible PA to super-tough PA, while LOTADER® GMA grades are the most suited to the modification of thermoplastic polyesters.

LOTRYL® is frequently combined with LOTADER® to optimise processability, impact strength and cost. LOTADER® and LOTRYL® are totally miscible with polyolefins (PO), and therefore are good compatibilisers for PA/PO and polyester/PO blends, as well as PET recycling.

Plastic additives

Coupling agent

For applications requiring blends of polymers with fillers (mainly long glass fibers or glass mat), the mechanical properties can be affected by lack of cohesion between polymer and filler.

Specific grades of OREVAC® and LOTADER® can be used as coupling agents to improve adhesion at the interface between the polymer and filler. Typical examples could be glass fiber reinforced PP compounds which are mostly used in the automotive industry to reduce weight and improve rigidity.

OREVAC® has been specifically designed as a coupling agent for this purpose in order to optimise mechanical performance.

OREVAC® is also used as a compatibiliser for fillers such as talc, mica, wollastonite, calcium carbonate or materials such as cellulose fibers and wood composite.





Halogen free flame retardant (HFFR) compounds

Cables used in buildings, automotive and power networks are increasingly required to be halogen free flame retardant.

Polyolefin based compounds with a high loading of specific flame retardant additives such as $Mg(OH)_2$ and $Al(OH)_3$ are often the solution.

Thanks to their high filler acceptance, EVATANE® and LOTRYL® are the right choice to develop these HFFR compounds. Due to its good thermal stability, LOTRYL® is especially suitable when high throughput or elevated process temperatures are needed.

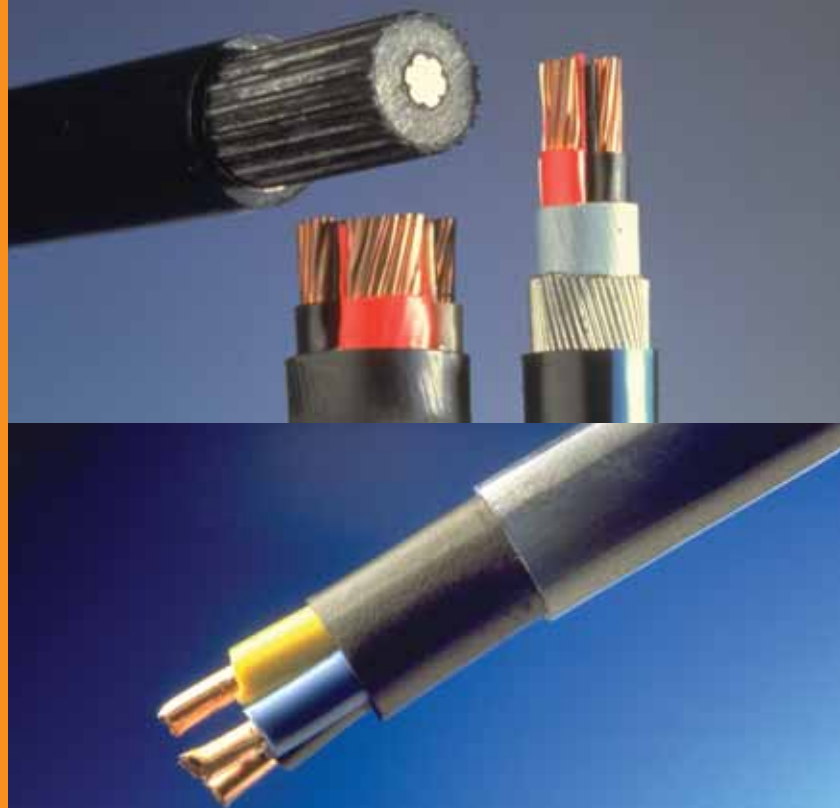
High levels of flame retardant additives affect the polymer matrix, which leads to low mechanical performance. This can be overcome by introducing OREVAC® or LOTADER® as a coupling agent between the polyolefin and filler.

EVATANE® and LOTRYL® can be easily cross-linked by peroxides, silanes or E-beam, when high temperature resistance is required.

Electrical & electronics

Semi-conductive and insulation layers

A typical medium voltage cable contains several layers of extruded polymers and compounds which contribute to meeting stringent requirements of the final application. Layers of semi-conductive compound containing a high level of carbon black often cover the conductors or insulation layer. Very good dispersion of the filler and excellent heat resistance are needed to control the electrical stresses. EVATANE® and LOTRYL®, with their high filler acceptance and good thermal properties, have contributed to achieving the guaranteed long life of cable demanded by the power industry. LOTADER® is often added to give better adhesion to both conductor and insulation layers which may be made of EVATANE® and LOTRYL®, in order to produce external semi-conductive layers with good strippability. Crosslinked polyethylene modified with a low level of clean LOTRYL® copolymer is one of the preferred materials for the cable insulation layer.



Thermo-adhesive films

Cars with interior cloth fabrics are more stylish and comfortable. Fabrics have to be supported by rigid structures both on doors and roofs.

Using thermo-adhesive films is an easy and environmentally friendly way to bond fabrics to substrates such as composites or rigid foams. LOTADER® and OREVAC® offer a wide range of grades suitable for different structures and usage conditions.

Sound dampening

Safety and comfort are the key words in the automotive industry. Noise reduction is a major feature and many different sound insulation systems have been developed.

EVATANE® and LOTRYL® copolymers actively participate in this battle by improving the performance of flexible sound dampening sheets or injected foamed obstructers.

A large range of grades is available for the sound dampening systems suppliers.



Automotive

Fuel tank

The main performance requirements for automotive fuel tanks are low fuel emission and high mechanical resistance.

The blow moulding coextrusion process allows to produce multi-layer plastic fuel tanks in association with HDPE incorporating hydrocarbon barrier material EVOH. The fuel tanks made with this process can have complex forms and low weight. Easy to recycle, these multi-layer EVOH structures were developed to replace fluorinated HDPE or metal tanks.

OREVAC® resins are used as a reference in this application, with suitable rheology for the blow moulding process and outstanding adhesion between HDPE and EVOH.

OREVAC® offers excellent adhesive and mechanical performance combined with remarkable resistance to different types of fuels.





Anticorrosion pipe coating system

TRISYS®, the three-layer pipe coating system epoxy / adhesive / PE or PP shows the highest efficiency in corrosion protection of oil and gas pipelines.

Arkema is the leader in this field with adhesives and topcoats used by the main coaters all over the world. Functional Polyolefins offers a wide range of products from OREVAC® adhesive resins to OREVAC® based powders for field repair joints and fittings.

Bitumen modification

Compatible and easily dispersed, the addition of EVATANE® or LOTRYL® dramatically improves the elastic behaviour (for better rutting and fatigue performance) and ageing resistance of bitumen. Cohesion between binders and aggregates for longer life of bitumen layer is enhanced.

In addition, EVATANE® and LOTRYL® contribute to increase safety by optimising skid resistance and stopping distance. They also improve the level of comfort by reducing traffic noise. These copolymers are also used to produce waterproof roofing membranes.



Construction

Heating tube

The coextrusion of heating pipes with a layer of EVOH or aluminium makes it possible to reduce the diffusion of oxygen into the heating circuits, thus drastically reducing corrosion. OREVAC® resins give good adhesion between EVOH and PE/PP, or aluminium and PE/PP.

In addition to their excellent adhesion, OREVAC® polymers offer good heat resistance, making them best suited for this application.



Flooring

Halogen free, flame retardant and low smoke materials have become increasingly important for flooring applications.

As it accepts a high level of fillers, due to its high polarity, LOTRYL® is the material of choice in order to develop HFFR compounds.

These products have low maintenance costs together with good chemical and scratch resistance.

Designers can let their imagination flow with these products.



Gloves

With LOTRYL[®], Arkema Functional Polyolefins offers a range of ethylene-acrylic ester copolymers that respond to the very specific needs of this rapidly evolving market.

Gloves made of LOTRYL[®] films have excellent touch characteristics that do not change the sensitivity of the fingers, offer excellent seal strength to avoid the risk of infection, as well as easy opening thanks to antiblock additives.



Health & hygiene

Hygiene films

In the hygiene market, disposable products have replaced traditional products in many areas, such as operating clothes, baby diaper films, incontinence diaper films and feminine hygiene products.

In this market, innovation is continuous.

There is always a demand for products that are more comfortable, quieter, and with a textile feel.

Using polyethylene requires a high capital investment to produce films having improved touch properties and better noise performance. A cast film process, with an embossed chill roll is therefore needed, whereas LOTRYL[®] only requires a blow film.

LOTRYL[®] allows the production of high quality films for both touch and noise properties.

In addition, LOTRYL[®] films allow improved sealability.

We bring you new ideas and reliable solutions

Research & Development

Continuous investment in R & D, at significant level of turnover, ensure **Functional Polyolefins** a long-lasting development. Close cooperation with our customers enables us to be in the forefront of the most recent developments of the market. Equipped with modern facilities, “very impressive” as described by the customers, our R & D center is the fountainhead of our creativity.

Expertise to be shared

“Be the first to be called by customers”. From the beginning, this is the guideline of our international business development team for their day-to-day work all over the world.

Know-how gained from more than 25 years’ experience in various applications allows us to be actively involved in the new developments of our customers.

Arkema **Functional Polyolefins** is regarded as their partner, or even a part of their team, who always brings new ideas and reliable solutions.

Quality

Arkema **Functional Polyolefins** implements a constant quality policy.

Our manufacturing sites are ISO 9001 and ISO 14001 compliant from the procurement of raw materials to the delivery of finished products.

We are with you,
anywhere in the world!

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