ARKEMA presents its latest innovations in Technical Polymers at Fakuma 2014

Arkema offers a comprehensive portfolio of technical polymers: the Group is the only chemical company in the world to offer the three families of long-chain polyamides (polyamide 10, 11 and 12) as well as PVDF fluoropolymers, suitable for all plastics processing technologies: injection molding, extrusion, and thermoforming. Arkema is showcasing its latest innovations at Fakuma 2014, in particular those developed for use in demanding industrial and automotive applications.

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Polyamide Innovations

Arkema, a leading developer of state-of-the-art solutions for automotive fluid transportation

As a leading solution provider to the automotive tubing market, Arkema Specialty Polyamides is constantly pushing the limits of thermoplastic tubes for fluid transportation in automotive under-the-hood and fuel system applications.

Constantly pushing the limits with new automotive Fuel line solutions
Arkema is constantly developing new specialty polyamide solutions for monolayer and multilayer tubing used in fuel line applications. Our solutions feature an outstanding balance between performance, cost and secure supply, always anticipating the new trends and constraints of the automotive market.

In gasoline for instance, the new line structures are mainly derived from Rilsan® T, a new fully biobased PA10.10 grade, and a new generation of tie layer grades called Rilsan® Tie Flex. The new layer distribution developed with these two innovative materials allows compliance with stringent specifications, including new environmental legislation requirements on automotive fuel lines.

In addition, Arkema offers a full range of specialty polyamide solutions for diesel, Compressed Natural Gas (CNG), and Liquid Petroleum Gas (LPG) lines.

A wide range of specialty polyamides for Selective Catalyst Reduction lines
EPA 10 and EURO VI implementation has major implications for all new small diesel engines for cars, in line with drastic NOx emission requirements, as with trucks or cars with bigger engines already subject to these regulations. Since the beginning of 2014 they have all been required to have a Selective Catalyst Reduction (SCR) system. In this field, Arkema Specialty Polyamides fully supports truck and car manufacturers as well as Tier 1 automotive suppliers with dedicated solutions for SCR lines, with its hydrolysis and chemical resistant Rilsamid® and Rilsan® grades and innovative new high temperature Rilsan® HT grades. These materials help cover the full spectrum of service temperatures required by the industry.

Rilsan® HT: going further in metal – rubber replacement for Cooling lines
Thanks to its excellent hydrolysis resistance, Rilsan® HT - the first flexible PPA - is entirely suitable for the most challenging applications of polyamides (aqueous medium management) in engines. In addition to SCR circuits, where the material needs to withstand attack from hydrolysis, it also allows the design of breakthrough solutions in cooling lines. Until now, cooling lines have been limited to the use of metal and rubber due to a lack of flexible thermoplastic materials with sufficient hydrolysis resistance at high temperatures. Rilsan® HT has already been chosen successfully for engine cooling lines, providing significant weight reduction versus metal-rubber assemblies.

Ready for new refrigerant gas, with Orgalloy®
Thanks to its excellent barrier properties to refrigerants, including new generation gas, Orgalloy® polyamide alloys are the material of choice for barrier layer in air-conditioning (A/C) hoses. Orgalloy® LT5050 T6L is specifically designed for use as a barrier layer or veneer for A/C hoses: in addition to its excellent barrier properties to HFC gas, it combines superior thermal resistance, flexibility and low density. It can be used as tube or film, in combination with rubber, and in direct contact with lubricants.
Polyamide Innovations

Arkema expands its range of specialty polyamides for injection molding applications

New PA6.10 grades, bio-based elastomer thermoplastics and high performance transparent polyamides: in each of these technical polymer ranges, Arkema offers grades that are perfectly adapted to the injection molding process.

New PA6.10 and laser-weldable grades for automotive quick connectors and other injection molding applications
Arkema is extending its specialty polyamide product range for injection molding applications with the release of a new PA6.10 filled with 30% glass fiber. This new Hiprolon® 70 MNWH6L G30 is a cost-effective solution with an excellent balance of properties. It exhibits superior chemical ageing and excellent thermal resistance in comparison to shorter chain aliphatic PA grades. Especially designed for transportation applications, such as quick connectors in automotive fluid circuits, and already approved at automotive OEMs, this new grade is also finding applications in various markets where short chain polyamides have shown their limit. In the Automotive quick connector field, Arkema is also developing and providing a range of laser-weldable solutions, thereby fulfilling a growing need of the industry.

Pebax® Rnew 80R53, a grade that goes beyond the limits of thermoplastic elastomers
At the last ISPO trade show in Munich, Arkema presented its latest Pebax® Rnew grade to the winter sports industry. Already a success in free-rider ski boots, the 80R53 grade opens up the scope of design possibilities for sports applications and beyond. This new rigid bio-based Pebax® combines light weight, high impact resistance, astonishing responsiveness and energy return, and creativity in decoration.

Pebax® Rnew 80R53 is 50% more rigid than existing Pebax® grades, while retaining the key Pebax® characteristics and environmental qualities that appeal to consumers: produced from renewable raw materials with over 90% biobased content, it is lightweight, features renowned long-term UV resistance as well as great creativity for novel designs, and maintains perfect quality and performance under extreme cold conditions.

In addition, thanks to its rigidity and outstanding processability, Pebax® Rnew 80R53 allows unequalled design freedom for thinner and even more lightweight and dynamic parts.

The Rilsan® Clear family is expanding
Rilsan® Clear is a family of high performance transparent polyamides, widely used in electronic and electrical, optical and industrial applications. They feature excellent transparency and glossy finish, flexibility and light weight, all providing a BPA-free solution for applications where this is a critical issue.

The two latest additions to the family are bio-based products with an outstanding set of properties. Rilsan® Clear G850 Rnew features a broad spectrum of performance properties, such as excellent flexibility and fatigue resistance, and outstanding optical properties and transparency. It has applications in spectacle frames, portable electronic housings, or even water meter casings. Rilsan® Clear G120 Rnew has outstanding chemical resistance, especially to alcohols. Thus, this grade can adapt to thin-walled geometries and applications in challenging industrial environments. United States Pharmacopeia (USP) class VI MED grades are also available for the healthcare market.
Arkema is extending the range of its Pebax® polyether-block-amide family with the introduction of its new Pebax® HD series. Pebax® HD is a range of high performance Thermoplastic Elastomers (TPE) specifically designed for use where resilience in aggressive working conditions is necessary.

While retaining the incomparable light weight, impact resistance and flex fatigue resistance that have ensured the success of Pebax®, the HD series is purposely engineered to address the specificities of demanding industrial environments. By tailoring the rigid polyamide backbone of the HD series, Arkema has worked on the combination of improved heat resistance and good chemical resistance, together with excellent abrasion resistance and high strength.

**HD stands for “Heavy Duty”**

This unique set of performances makes Pebax® HD a choice material wherever environmental conditions are harsh. Available in two grades (HD 5513 and HD 6313), Pebax® HD can be used in a wide range of applications such as pneumatic and hydraulic tubes, wire and cable, low noise gears, airbag covers and automotive films, railway pads, etc. Pebax® HD series is easy to process by both injection molding and extrusion. It can also be used as an additive in PA6 to improve the tear strength and flexibility of blown film at low temperature.

_A global chemical company and France’s leading chemicals producer, Arkema is building the future of the chemical industry every day. Deploying a responsible, innovation-based approach, we produce state-of-the-art specialty chemicals that provide customers with practical solutions to such challenges as climate change, access to drinking water, the future of energy, fossil fuel preservation and the need for lighter materials. With operations in more than 40 countries, some 14,000 employees and 10 research centers, Arkema generates annual revenue of approximately €6.4 billion, and holds leadership positions in all its markets with a portfolio of internationally recognized brands._
PVDF Innovations

Multisupport, multipotential Kynar®

Arkema is showcasing its latest Kynar® innovations at the Fakuma 2014 trade show: specific grades for the manufacture of foam parts, ultra-strong textile fibers, water pipe liners, and the protection of parts made from a variety of polymers used in construction.

PVDF foam: the properties of Kynar®, with light weight as an added bonus
Arkema continues to develop its range of applications based on its latest patented technology for the extrusion of Kynar® closed-cell foam with a masterbatch that can be used with Kynar® and Kynar Flex®. This technology is suitable to produce components by extrusion or injection molding. Up to 30% lighter, these components provide an excellent solution for industrial applications where weight reduction is key, or in the automotive sector for hoses and flexible tubes requiring exposure to harsh conditions:

· Resistance to most solvents and chemical agents,
· Resistance to gamma and UV rays,
· Cutting capability,
· Fuel barrier,
· Excellent mechanical strength.

A high fluidity Kynar® grade for ultra-resistant PVDF textile fibers
Arkema has developed Kynar® 705, a new high flow PVDF homopolymer resin grade to produce ultra-resistant PVDF mono- and multi-filament textile fibers using standard spinning equipment. These fibers can be woven into very durable textiles for the water, chemical filtration, and architectural markets.

Arkema has set up a partnership with Lenzing Plastics GmbH, a major supplier of fluoropolymer filaments and fibers, to develop the use of this product in multifilament fiber applications.

Tests have shown that Kynar® 705 fibers are 25% more tenacious than other fluoropolymer fibers. These fibers can be woven into technical textiles used as filtration media in water and chemical applications, as fabric backing for greater sturdiness of PVDF parts, and as architectural taut fabrics.

Kynar® 705 filtration textiles are easy to clean, while their lifetime is up to 10 times longer than filtration materials made from non-fluorinated products.

Kynar® E grade for multilayer structures for use in water transport systems
Arkema already holds a patent describing multilayer structures - comprising PE, tie layers, and Kynar® for the layer in contact with water - for use in the transport of cold drinking water. The Company recently achieved another milestone by developing a patent for multilayer structures comprising specific fully heatproof binders, for use therefore in the transport of hot water, thereby significantly extending the scope of application in the water transport sector.

These structures rely on the use of a Kynar® liner so that drinking water may be conveyed in optimum conditions, including through contaminated land. The Kynar® E product range has been specifically developed for this purpose, and maintains the purity of the water intact from the point of entering the pipe right up to the point of flowing from the tap.
New Kynar® grades for direct adhesion onto PC, ABS or PVC matrices, without tie layers

Drawing on its research, Arkema has developed a range of specialty compounds from Kynar® that enable direct adhesion in a two-layer co-extrusion process with PC (polycarbonate), ABS-PC, ABS, or PVC. The resulting compounds extruded into a thin transparent layer feature superior protection for those polymers that are more prone to decay from atmospheric agents including UVs. Their resistance to solvents outperforms that of PMMA, making it easier to clean up graffiti and grime. Tiles, claddings, window profiles made of PC, ABS or PVC can be easily protected with this new grade of Kynar®.

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