

Arkema presents its non-metallic solutions for the Oil & Gas Industry

A global chemical player and an acknowledged leader in High Performance Polymers trademarked Rilsan® and Kynar®, Arkema confirms its 35 years' experience and trustworthy innovations serving the Oil & Gas Industry. Through a wide range of advanced materials and protective coating systems, Arkema offers the best flexible alternatives to stainless steel for highly corrosive environments.

Kynar®
Polyvinylidene Fluoride

Rilsan®
FINE POWDERS

Rilsan®



The Oil & Gas industry has been using metallic materials for many years, but in some instances this metallic world has opened the door to non-metallic materials like thermoplastic polymers and composites. Ever-increasing energy demand and the need for new efficient technologies are driving oil companies to push on technological boundaries ever further by using reliable partners and field-proven solutions. With its **Rilsan®** and **Kynar®** solutions, Arkema, the world leader for high performance polymers used in Oil & Gas applications, fulfills these latest technological requirements.

As a global company operating in every region of the world, and through its long and successful history as part of a major international oil company with offshore flexible pipes and umbilicals, Arkema today benefits from a strong Oil & Gas business culture. Arkema's resins have been introduced to promising onshore applications: anticorrosion liners for steel pipes, liners for composite pipes, stand-alone pipes, gas distribution pipes and anticorrosion coating systems. With **Rilsan®** and **Kynar®**, Arkema offers a unique and complementary range of high performance products for the Oil & Gas industry, from exploration and production to refining and transportation.

Rilsan® 11 is a high performance polyamide derived from a natural vegetable oil. Widely used in the most demanding applications, **Rilsan® 11** boasts an exceptional combination of strength, chemical and hydrocarbon resistance, and thermal stability. It also offers much freedom in terms of design and processing. The remarkable properties of **Rilsan® 11** guarantee the safe operation of the offshore field in extreme conditions, and ensure unprecedented levels of performance for submarine pipes: temperature resistance greater by 10°C than for competitive materials, double lifetime in a given environment, and optimized mechanical properties.

Kynar® PVDF is used in applications which need to withstand extreme temperature and pressure conditions. As leading material for HP/HT (High-Pressure/High-Temperature) technologies, it also offers exceptional barrier properties as well as outstanding chemical resistance. Kynar® PVDF is the only fluorinated polymer that can be extruded for offshore flexible pipes with temperature resistance up to 130°C.

Rilsan® protective coatings are used as anticorrosion systems for the internal and external coating of tubings, line-pipes and fittings. Thanks to their remarkable inherent properties, **Rilsan®** protective coatings outperform FBE (Fusion Bonded Epoxy) coatings by showing no brittleness, superior flexibility (10x), and greater wear resistance (2x) in the most demanding environments. **Rilsan®** protective coatings offer a recognized alternative to stainless steel for corrosion protection. **Rilsan®** fine powders coatings are the ideal solution for sour services and high salt contents: it has been specified for over 10 years in water injection lines and production lines.

Kynar® ADX coatings are the latest coating solution from Arkema, with developments in the Oil & Gas industry. With a differentiating direct adhesion to steel and a temperature resistance up to 130°C, it offers a new alternative to stainless steel for corrosion protection in higher temperature environments. Its exceptional barrier and chemical resistance properties are complemented by outstanding UV resistance.

Arkema's experts are at your disposal to develop new technologies and discuss what can be achieved with High Performance polymers for the corrosion protection of steel pipes and as alternative non-metallic solutions.



Rilsan® 11 for Natural Gas Piping



Pipes in In Amenas desert (Sahara]



Coating process of pipes in a dipping tank

A global chemical company and France's leading chemicals producer, Arkema consists of three strategically related businesses: Vinyl Products, Industrial Chemicals, and Performance Products. Arkema reported sales of 5.7 billion euros in 2007. Arkema has 15,200 employees in over 40 countries and six research centers located in France, the United States and Japan. With internationally recognized brands, Arkema holds leadership positions in its principal markets.

Arkema's Rilsan[®] 11 at the heart of technological innovation in deep offshore oil production

The high performance flexible pipes raising the oil from Dalia, a deep offshore field with outstanding characteristics operated by Total, were designed and manufactured by Technip from Rilsan[®] 11, a material with proven reliability in over 25 years' service in offshore subsea conditions with its superior temperature resistance.

The vast Dalia oilfield, one of the world's largest deep offshore developments, is located 135 km off the Angolan coast, and covers an area in excess of 200 km² at a depth of between 1200 and 1500 m. The development of the field, which has outstanding characteristics, has called upon specific know-how and technological innovation.

The only material to have proved reliable following 25 years' service in offshore oil production, Arkema's **Rilsan[®] 11** was chosen by Technip for the manufacture of these risers using the new IPB (integrated production bundle) technology. These 1,650 m long flexible pipes bring up the fluid from the bottom to the production and storage floating unit on the surface. They include for the first time multiple functions for production, activation and safety of offshore production.

The remarkable properties of **Rilsan[®] 11**, a product derived from a renewable raw material source, guarantee the safe operation of the offshore field in extreme conditions. **Rilsan[®] 11** ensures unprecedented levels of performance for submarine pipes: temperature resistance greater by 10°C than for competitive materials, double lifetime in a given environment, and optimized mechanical properties.



With **Rilsan[®]** and **Kynar[®]**, Arkema offers a unique and complementary range of high performance products for the offshore industry. **Kynar[®] PVDF** is used for offshore flexible pipes which need to withstand extreme temperature and pressure conditions.

Arkema's **Rilsan® 11** is a high performance polyamide derived from a natural vegetable oil. Widely used in the most demanding applications, **Rilsan® 11** boasts an exceptional combination of strength, chemical and hydrocarbon resistance, and thermal stability. It also offers much freedom in terms of design and processing.



With global brands like Rilsan®, Pebax® and Kynar®, unique products like Rilsan® polyamide 11 and leading capacities in Rilsan® polyamide 11 and 12, Arkema's Technical Polymers business unit stands out in the industry by providing its customers with global coverage and superior regional service from production facilities and research centers in Europe, Asia, and the USA.

**ARKEMA's
High Performance Polymers for the Oil and Gas Industry**

35 Years of Experience and Innovation



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