



SOLVAY

asking more from chemistry®

**Reliable Performance in
O&G Extreme Environments**

**SPECIALTY
POLYMERS**

Flexible Pipes

Risers, Flowlines, RTP and Umbilicals

Solvay's specialty polymers used in flexible pipes offer safe and reliable performance in service conditions with temperatures ranging from 65 °C to 180 °C and internal pressures up to 1,000 bar. They are highly resistant to oilfield fluids, H₂S and CO₂, and they combine mechanical strength with flexibility to allow pipe coiling.

Solvay's high-performance polymers have been used for the pressure sheath in flexible pipes for over 15 years and are fully qualified to API standards. They are also used for anti-wear, anti-creep and insulation tapes as well as for outer sheathing. These products include:

- **Polidan® PEX**
- **Solef® PVDF**
- **Hyflon® PFA**
- **AvaSpire® PAEK**
- **KetaSpire® PEEK**

Liners & Tubing

Polymeric liners represent a growing alternative to corrosion-resistant alloys and specialty coatings used to prolong the service life of new and existing pipe assets, helping to significantly reduce the need for inspection, maintenance, downtime and injection of chemicals.

Solvay's high-performance polymers are engineered to withstand typical on-shore and off-shore scenarios, including installation environments and the rehabilitation of existing subsea flowlines. They withstand a broad range of environmental and operating conditions, have excellent resistance to high level of sour content as well as withstand temperature up to 200 °C.

Solvay product for internal linings, pipelines or tubing, are:

- **Polidan® PEX**
- **Solef® PVDF**
- **Hyflon® PFA**
- **Ryton® PPS**
- **KetaSpire® PEEK**

Protective Coatings

Coatings made of **Solef® PVDF**, **Halar® ECTFE** and **Hyflon® PFA** fluorinated polymers provide excellent corrosion protection for pipe assets. Solvay has developed a range of products to address specific technical challenges for service conditions from -30 °C to 240 °C, as well as proprietary technologies for enhanced adhesion.

Coatings are typically applied by electrostatic powder coating techniques. Used internally, they help reduce scaling and enhance flow, thanks to their exceptional surface smoothness and low surface energy. Used externally, they provide long-term protection against moisture, oxygen and UV light.

Ryton® PPS and **KetaSpire® PEEK** combine excellent friction and wear resistance along with broad chemical resistance and low permeation to oilfield conditions. They can extend the service life of metal components in highly abrasive environments up to 220 °C. Products are available as aqueous or solvent dispersions for spray coating, and they can also be applied by conventional electrostatic powder coating techniques.



Courtesy of NKT Flexibles



Courtesy of IFL

Sealing & Wear Resistance

Seals, O-Rings and Gaskets

Tecnoflon® FKM and **FFKM** are fluoro- and perfluoro-elastomers which provide best-in-class thermal and chemical resistance and are ideally suited for extreme low and high temperature operating environments. They withstand explosive decompression, demonstrate excellent compression/stress relaxation properties, and perform well in sour environments.

Downhole Components

Ryton® PPS, **KetaSpire® PEEK** and **Torlon® PAI** display excellent fatigue and wear resistance together with thermal and chemical resistance. Parts are typically machined from stock shapes into a variety of high strength components such as compressor plates, poppets, seals, back-up rings, bushings, bearings and electrical connectors.

Drilling & Completion

Rod Guides for Sucker Rods

Amodel® PPA is typically used for rod guides in artificial lift operations thanks to its resistance to oil temperatures up to 200 °C. It exhibits high mechanical and impact strength along with abrasion and wear resistance in hot, sweet and sour, sandy, high water or high brine environments.

The material's ability to resist damage from impact and shock loadings makes Amodel® PPA an excellent candidate for sucker rod-couplings and production tubings.

Packer Elements

Tecnoflon® FKM and **FFKM** are suitable for manufacturing downhole packers with an end-use temperature of up to 300 °C. They can also withstand very hard oilfield chemicals, including CO₂ and H₂S.

FFKM withstands exposure to completion fluids such as oil-based mud, brine, bromides, high pH completion fluids, and amine-based inhibitors as well as exposure to solvents such as xylene, toluene and methanol.

Lubricants

Fomblin® PFPE fluorinated fluids are fully inert and not miscible with hydrocarbons and water. They make excellent lubricants for use from –100 °C to 290 °C in subsea and other harsh environments.

Shale Reservoirs

Frac Balls

Torlon® PAI used in shale gas production provides excellent sealing in multi-stage fracturing jobs, thanks to its high heat resistance, dimensional stability under high pressure, and very low permeation to gas.

Breakers

Diofan® can be used to encapsulate breakers, such as ammonium, potassium and sodium persulphate, used in fracturing fluids. The polymer acts as a barrier to water and prevents the breaker from becoming active before the pressure is released.

Breaking agents are an important component of hydraulic fracturing fluids, particularly gelled fluids, as they assist with clean-up of the fracture by reducing the viscosity of hydraulic fracturing fluid.

Cables

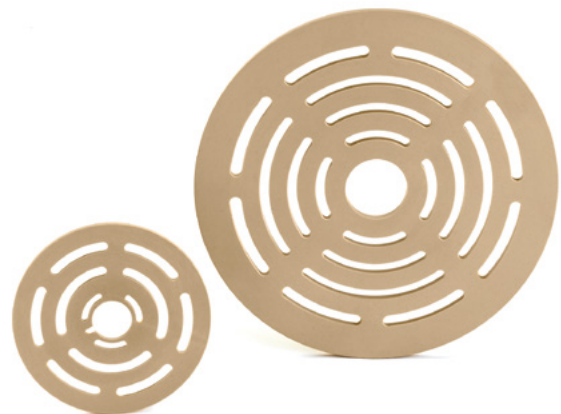
Platform Control Cables

Cogegum® XLPO cross-linkable compounds are ambient-cure, halogen-free, fire-retardant polymers used in wire and cable insulation and sheathing. They are suited for working temperatures up to 90 °C as well as short-circuit temperatures up to 250 °C. They readily withstand oils, fuels, alkalines, and acids as well as drilling mud and fluids.

Heating and Downhole Cables

Fluoropolymers provide excellent electrical insulation and dielectric properties, intrinsic fire resistance, and thermal stability up to 250 °C, making them suitable for cable insulation and jacketing. They are also used to encapsulate thermo-mechanical cables due to their excellent abrasion and crush resistance.

- **Halar® ECTFE**
- **Algoflon® PTFE**
- **Hyflon® PFA**





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