

# Engineering Plastics for the Offshore Industry



## TRENDS

Engineering plastics are replacing metal components in a wide variety of critical applications in the offshore exploration and production fields. Plastic components have to withstand extreme pressure, temperature and hostile environments.

## KEY PROPERTIES

Quadrant's plastic materials deliver the highest reliability and performance for this market. Customers all over the world benefit from their outstanding properties:

- High mechanical strength
- Materials operating in temperatures of  $-150^{\circ}\text{C}$  ( $238^{\circ}\text{F}$ ) to  $400^{\circ}\text{C}$  ( $750^{\circ}\text{F}$ )
- Good lubricity properties
- Excellent dimensional stability
- Chemical and corrosion resistance
- Low weight compared to metal components
- Low moisture absorption
- Low coefficient of thermal expansion

## CUSTOMER BENEFITS

Flexibility in product portfolio and manufacturing capabilities provide our clients with a competitive edge. Quadrant's global partnerships provide technical service and application development. High volume moulded parts to lower volume custom cast and machined components, Quadrant has the solution. Quadrant can provide the platform for bringing your concept to the production line.

## MAIN APPLICATIONS

- Pipeline systems (diablo rollers, pipe supports, clamps)
- Sub sea vehicles (track plates, wheel sprockets, impact strips)
- Lifting equipment (cable sheaves, hook blocks, bearing pads)
- Instrumentation (insulators, sensor protectors, guidance probes)
- Compressor, pump and valve components (seals and bearings)
- Offshore equipment (riser clamps, bushes)



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You inspire ... we materialize®

## Quadrant solutions based on global experience

### Cable Sheaves

**Challenges:** Lifting devices on rig platforms are equipped with wire or rope sheaves reaching diameters of 5 meters. The wire or rope run across the sheaves that are made of welded steel. Excessive wear reduces the life of the wire or cables producing a potential safety hazard.

**Solution:** Nylon cable sheaves made of Quadrant's materials handle the high load requirement. Because the material is made of non-abrasive plastic, it reduces wear on the cable or rope. UV protective additives in the material also provide exposure to the harsh environment.



**Benefit:** The longer wear and reduced safety hazard are an extreme benefit for operators. All materials are available in various sizes customizable to operators needs.

### Bending Restrictors

**Challenges:** Flexible pipe and cables are most prone to failure when attached to a fixed device such as a sub-sea riser base. Bend restrictors are designed to support, decouple load and prevent the pipe from over bending. The restrictors see excessive wear and friction from the movement of the pipe.

**Solution:** Quadrant's engineering plastics outperform on the most critical aspects, such as reduced galling, outstanding compressive strength and wear resistance, and deliver a superior solution to the customer.



**Benefit:** Quadrant's materials provide operators with confidence in their piping installation. Failures and premature wear are reduced in the application; materials are available in many customer formulations and sizes.

### Labyrinth Seals for Turbo Compressors

**Challenges:** Turbo compressor performance and dependability relies on the seals in unit. The standard aluminum seal provided with the compressor can become bent during compressor disruptions. They can also experience chemical attacks in harsh environments. Lost efficiency in the compressor train can reduce production output.

**Solution:** Polymer labyrinth seals will flex not bend, they are chemically inert and can run at tighter tolerances providing a superior performance. Parts based on Quadrant's Fluorosint<sup>®</sup>, Ketron<sup>®</sup> PEEK and Torlon<sup>®</sup> PAI materials have proven best performance when applied in a turbo compressor environment.



**Benefits:** Improved efficiency and longer running time between repairs are the benefits of using polymer based labyrinth seals. Proper selection of material and seal design can insure increased efficiency and uninterrupted performance.

### Valve Components

**Challenges:** High load, constant service, spot service, corrosive environment and extreme temperatures are reasons many valve applications are switching to plastic components.

**Solution:** Polymer valve seats, thrust washers and bushings are replacing metal components. The Fluorosint<sup>®</sup> product portfolio from Quadrant meets customer's demand for high load and high temperature applications. The mica filled PTFE product provides extreme wear characteristics for longer life.

**Benefits:** The low deformation under load allows the Fluorosint<sup>®</sup> products to provide solutions for clients where only metal or ceramics would perform. Supplying Fluorosint<sup>®</sup> material can reduce the required actuator torque, increase life and reduce down time between repairs.



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