



PUSHING **BOUNDARIES**
TOWARDS **FUTURE PERFORMANCE**

PEEK POLYMER SOLUTIONS
FOR THE ENERGY INDUSTRY



victrex®

FUTURE PERFORMANCE IN ENERGY

Deep-water drilling rates cost an average of \$400,000 per day – a major concern for those facing the industry average of 5-10% downtime due to tool failures. In addition, ‘easy’ oil is gone. Global oil service companies and end-users must be able to find new oil reserves, get to it quickly and safely, and maximize recovery. For these non-conventional reserves, the industry is forced to expose valuable equipment to extreme temperatures, high pressures, and corrosive fluids and gases. Avoiding costly downtime, extending service life, operational safety, and improved recovery are at the forefront of an engineer’s mind when designing a downhole tool system. Achieving the highest level of reliability and efficiency while minimizing risk starts with cutting-edge materials. Victrex has provided best-in-class solutions for more than three decades. With our unmatched industry and technical expertise, we can work together to design equipment that will survive and thrive in the most extreme environments. In fact, our polymeric solutions are used in more than 75 million sealing systems today.

Safe, long-lasting, and efficient downhole tools comprised of proven polymeric solutions that help reduce downtime and risk – that’s future performance.

YOUR BENEFITS

300x

HIGHER CREEP RESISTANCE THAN PTFE BACKUP RINGS

2x

LONGER LIFETIME THAN GLASS-CERAMIC CONNECTORS

2x

HIGHER LOAD BEARING CAPACITY THAN OTHER PEEK SEALING SYSTEMS

100%

RETENTION OF TENSILE STRENGTH AFTER 1,000 HOURS IN A 3-PHASE AROMATIC NORSOK SYSTEM WITH GAS PHASE OF 100% H₂S AT 175°C (347°F)

PROVEN RELIABILITY

VICTREX® PEEK solutions provide stable performance in temperatures ranging from -196°C (-321°F) up to 260°C (500°F) with the capability of withstanding pressures up to 207 MPa (30,000 psi). It's not by chance that our polymers have been specified in more than 75 million sealing systems to date.

IMPROVED EFFICIENCY

Deep-water day rates can cost nearly half of a million dollars. Leading companies rely on increased tool utilization and reduction in downtime when drilling for reserves. VICTREX® PEEK-based connector solutions offer double the power transmission capabilities of glass-ceramic systems.

LONGER LIFE

In the development of unconventional reserves, the operating conditions for down-hole tools are becoming more extreme. VICTREX® PEEK-based solutions provide durability even when operating in corrosive elements such as hydrocarbons, seawater, and harsh gases. Beyond chemical resistance, our polymeric solutions provide excellent erosion, creep and pressure resistance to deliver a long service life.

FULL TRACEABILITY

Victrex has worked with leading organizations to certify that our PEEK solutions meet industry standards such as NORSOK, ISO, ASTM, and API. Quality assurance is a top priority and is backed by 50 tests on every batch to ensure consistent product performance. Our technical expertise in PEEK solutions for the Energy industry is unrivalled.

EXTENSIVE PORTFOLIO

Victrex offers a customized portfolio of products to meet your key engineering requirements. Our solutions range from materials suited for cryogenic environments to extremely high temperatures. There is no one-size-fits-all solution – that's why we offer a portfolio.

ON-TIME DELIVERY

Our investment in a 70% capacity increase, a presence in more than 30 countries, and 3-7 day lead times on standard products confirms our dedication to providing a stable supply chain for our customers. We are often able to meet just-in-time orders due to our strategically-positioned warehouses.

VICTREX PRODUCT PORTFOLIO

REACHING NEW LEVELS OF PERFORMANCE

As the inventor of PEEK, Victrex has focused on developing high performance polymeric solutions for more than three decades. This dedication provides us with a wealth of polyaryletherketone knowledge that no other material supplier can offer. By working together, we can turn the toughest challenges into benefits.

Our collaborative approach in providing only the most innovative and highest-quality solutions enables the industry to reach new levels of performance today and tomorrow.



VICTREX® PEEK

Victrex solutions, including VICTREX® PEEK 450G™ polymer, are the gold-standard for the Energy industry. Enable downhole tools to have an extended service life and more uptime by specifying a customized solution for your components.

- 35+ years of proven performance in extreme environments
- Customized solutions to meet specific application and technology requirements
- Injection molding, compression molding, and extrusion grades



APTIV® FILM

Take advantage of the properties of VICTREX® PEEK in a thin film format for demanding applications. By offering unmatched processing opportunities, APTIV® film allows for the design of durable solutions.

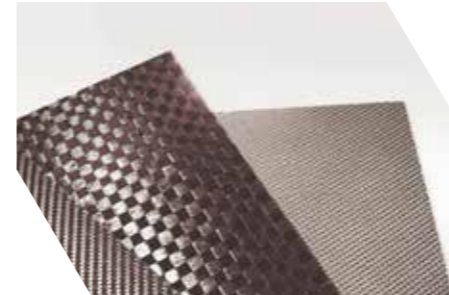
- Enhance efficiency and product lifetime through excellent thermal management
- Laminate, seal, weld, metallize, and many more
- Available in thicknesses from 5 to 750 microns



VICTREX PIPEST™

Lightweight tubing manufactured from VICTREX® PEEK polymers can be used for fluid transport, protective sheathing, cable conduits and lining systems. Benefit from the ability to design tubing systems that can withstand extreme environments.

- Cost-effective compared to expensive, corrosion-resistant alloys
- Lightweight and flexible for ease of installation and spooling
- High mechanical strength, ductility, and chemical resistance



COMPOSITES

Combine strength and light weight by specifying a VICTREX® PEEK-based composite solution. This innovative technology allows engineers to design for the most demanding applications.

- Withstand extreme oilfield environments
- 5x higher specific strength
4x higher fatigue strength
4x higher specific stiffness vs. aluminum
- Available in braid, fabric, flake, long fiber pellets, tow, and unidirectional tape and sheets



VICOTE® COATINGS

Durable VICTREX® PEEK coatings enhance the lifetime of metal substrates while being friendly to the environment. Improve the performance of your components with Victrex liquid and powder dispersions.

- Excellent resistance to wear, abrasion, high heat, creep and chemicals
- Use a one-coat system for a smooth, uniform surface
- Halogen-free with no additives



APPLICATIONS

RIGOROUSLY TESTED.
CUSTOMER APPROVED.

Victrex collaborates with industry-leading companies to turn demanding challenges into benefits. We have seen it all from maximizing uptime through innovative designs to asset protection and performance in the harshest operating conditions. Our PEEK expertise allows us to provide unmatched application development support to help in the manufacture of next-generation components.

Involve us from the beginning – we can get there together.



SEALING SYSTEMS

The Energy Industry has relied on VICTREX® PEEK-based solutions in sealing systems for more than three decades. Our portfolio of products provide reliability across a wide range of operating conditions.

- 100% better pressure resistance than PTFE back-up rings
- 18x higher compressive creep resistance than PTFE back-up rings
- Up to 45% less creep after 12 months at 200°C (392°F) and 1.56 MPa (226 psi) compared to Other PEEK



ELECTRICAL CONNECTORS

Engineers specify VICTREX® PEEK materials due to their ability to be molded and perform in extreme temperatures and pressures, harsh chemicals, and moisture. Take your connectors to the next level by working with Victrex.

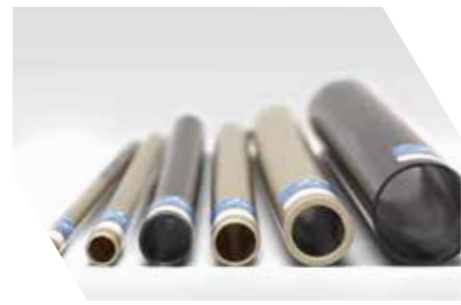
- Double the lifetime vs. glass-ceramic
- 2x higher power transmissions vs. glass-ceramic
- Zero electrical leakage due to excellent insulating properties



ELECTRICAL INSULATION

Protect critical wiring and cables by using a VICTREX® PEEK-based insulation. These solutions provide excellent durability in both extremes of temperature and in harsh chemicals and gases.

- Improved hydrolysis resistance vs. polyamide.
- Zero electrical shortages from excellent cut-through and abrasion resistance
- Stable performance up to 200°C (392°F) and 100 MHz



FLUID TRANSPORT TUBING

VICTREX® PEEK-based tubing opens new opportunities for safe and reliable fluid transfer. VICTREX Pipes™ can be used as wear- and erosion-resistant protective liners in low-cost carbon steel pipes for improved corrosion resistance – previously only the domain of expensive, corrosion-resistant alloys.

- 67% longer service life vs. steel
- Up to 65% lighter vs. metal
- Long-term deployment in methanol at 160°C (320°F)



MAGMA M-PIPE®

m-pipe® is the world's most reliable subsea pipe, manufactured for use as risers, jumpers and intervention lines. This technology uses the highest quality materials including carbon fibre and VICTREX® PEEK polymer to deliver significant benefits.

- Designed for deep water and pressures up to 20,000psi and temperatures up to 200°C (392°F)
- 90% weight saving in water compared with equivalent steel or un-bonded flexible pipe
- Fatigue performance unaffected by sour service and corrosion resistant to H₂S, CO₂ and HF



COMPRESSOR COMPONENTS

Compressor manufacturers have specified VICTREX® PEEK-based solutions for several decades due to their ability to perform in extreme operating conditions. Improve the lifetime of your compressor with Victrex thermoplastics.

- 50% noise, vibration and harshness reduction vs. metal
- 100% less water absorption than polyamides above 90°C (194°F)
- 2x higher compressive strength vs. other polyketones at 250°C (482°F)

APPLICATIONS

FROM A TO Z

ANTENNA SLEEVES BACK-UP RINGS BEARINGS BUSHINGS CABLE JACKETING
CABLE TIES COMPOSITE WEAR RINGS COMPRESSOR COMPONENTS
COMMUNICATION CABLES DATA LOGGING ELECTRICAL CONNECTORS
FLUID TRANSPORT TUBING FRACK BALLS GAS SEPARATION
GEARS IMPELLERS INDUSTRIAL HOSES JUMPERS MAGNET WIRE
MARINE RISERS PACKER SEAL STACKS PIPE LINERS
POWER CABLES PRESSURE VALVES PRIMARY SEALS
PUMP HOUSINGS RFID TAGS SENSORS SLICKLINE
COMPONENTS SLOT LINERS THRUST WASHERS
TUBULARS VALVE SEATS UMBILICALS
WELLHEAD SEALS AND CONNECTORS
WIRE BUNDLE CLAMPS
WIRESLINE COMPONENTS
WIRE COATING

MATERIAL DATA

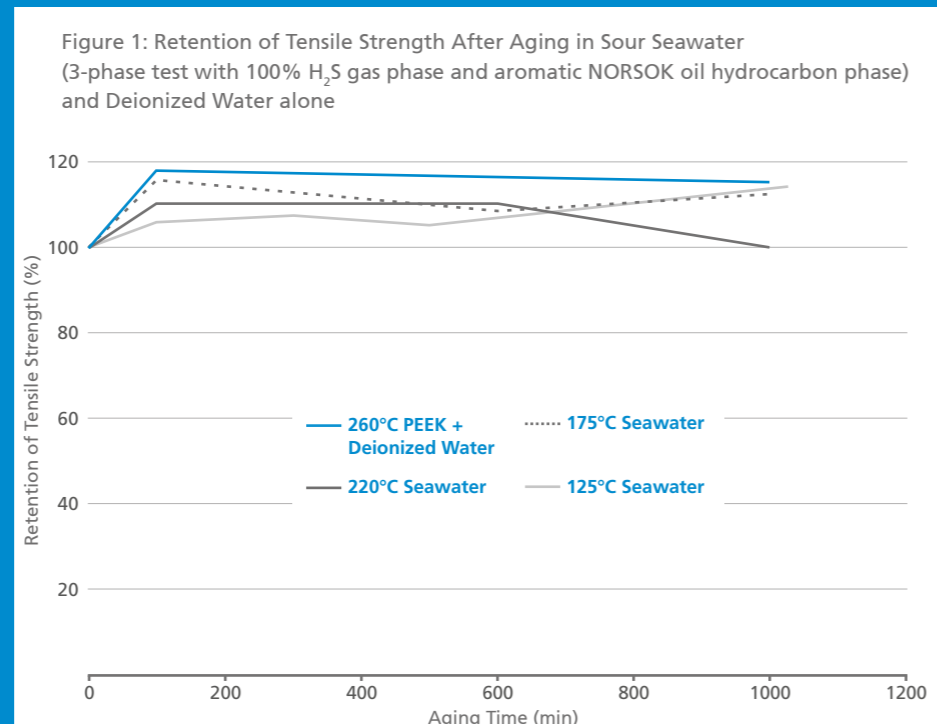
PERFECTION IS A SCIENCE

Take advantage of talking to the people that invented PEEK and can reference the largest polyketone database of testing in the world. Our scientists and engineers go the extra mile to make sure that our customers have all of the information they need when designing their critical components.

We welcome the opportunity to use our three decades worth of knowledge to help speed up your application developments.

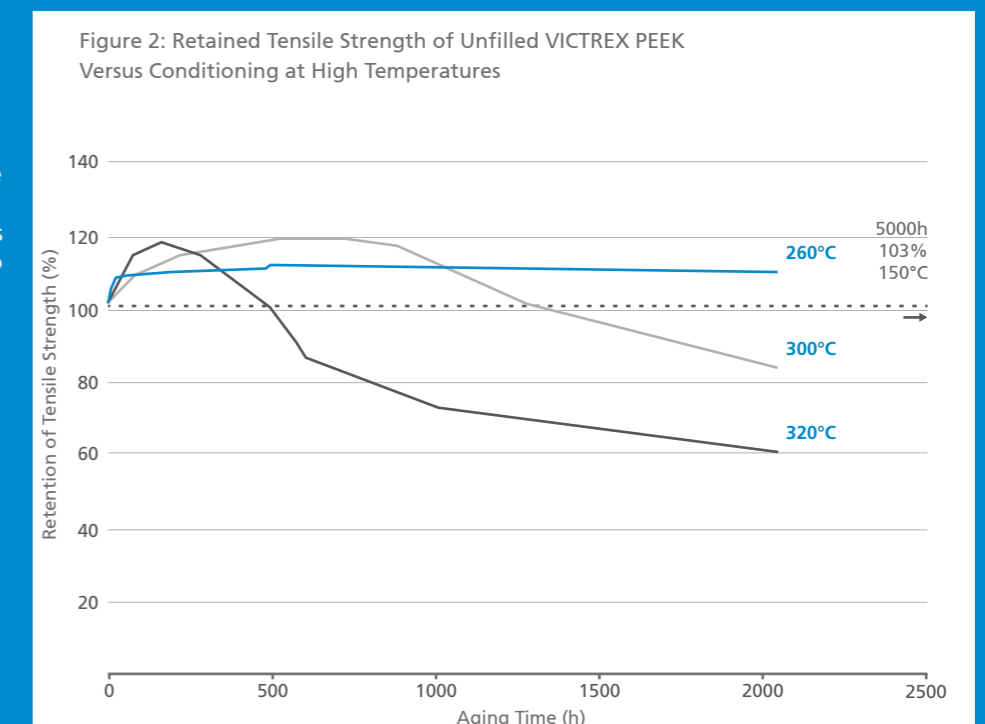
SOUR GAS PERFORMANCE

Victrex is independently assessing its PEEK polymers in even more aggressive environments than have ever been tested before. To date, the polymer has been tested in three-phase sour environments where the gas phase is 100% H₂S corresponding to more than 1% at 30,000psi (207MPa) and at temperatures of 220°C (428°F).



STABILITY ACROSS BROAD TEMPERATURE RANGE

With some applications enduring long-term exposure to high temperatures, VICTREX® PEEK is able to maintain its tensile strength with no performance loss over 5,000 hours at 260°C (500°F). VICTREX® PEEK also exhibits high mechanical properties at extremely low temperatures down to -196°C (-321°F).



MATERIAL DATA

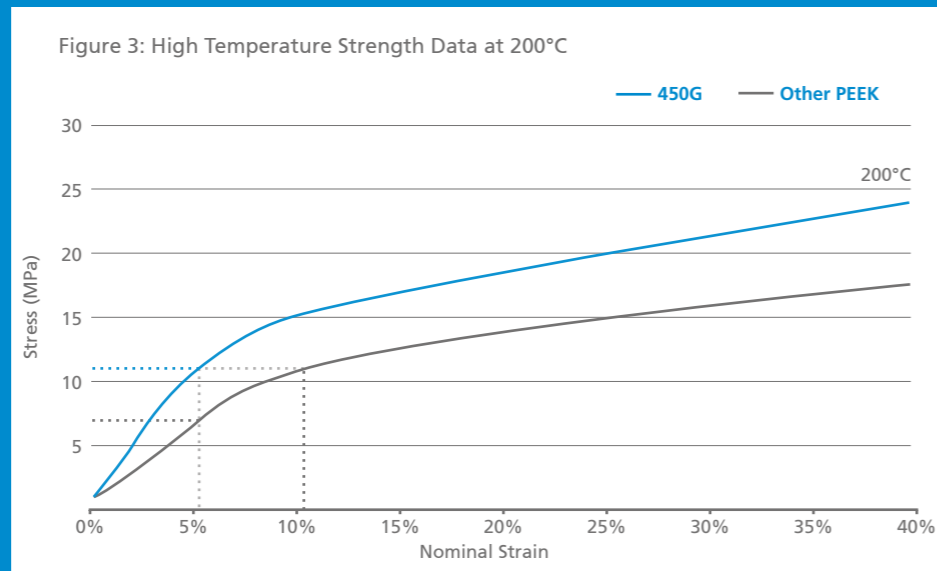
PERFECTION IS A SCIENCE

VICTREX® PEEK VS. OTHER PEEK

PEEK is THE high performance polymeric solution for reliable performance in corrosive, HPHT environments. Not all PEEK is the same. VICTREX PEEK can offer up to twice the load bearing capacity compared to other brands while operating in the harshest conditions. Trust VICTREX PEEK and its more than 30 years of reliable performance in downhole tool components.

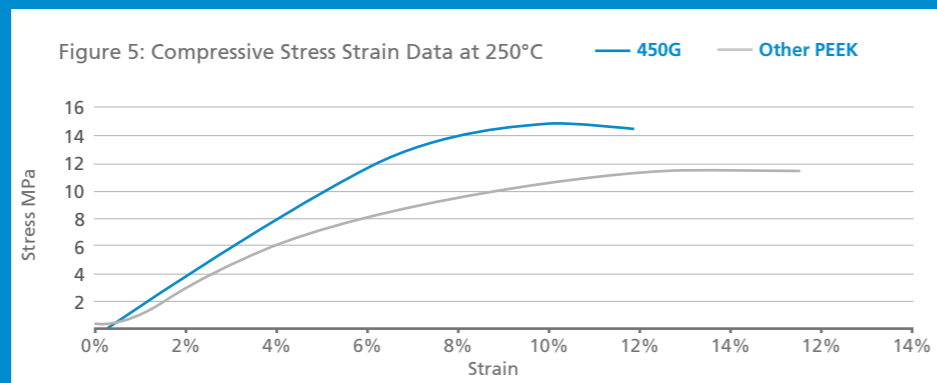
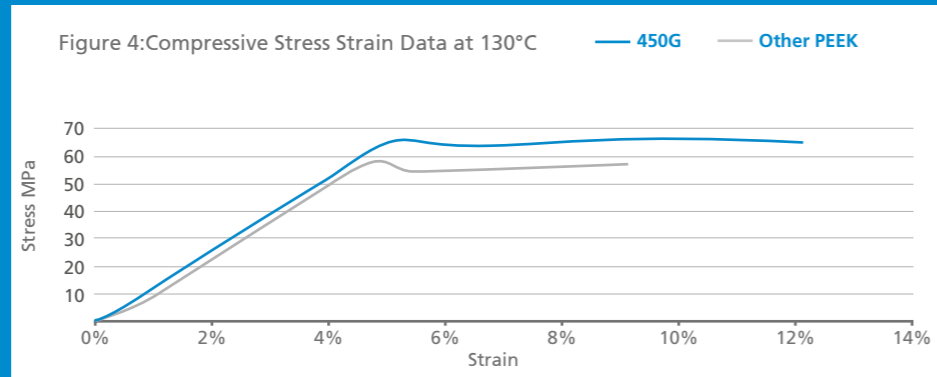
HIGH TEMPERATURE STRENGTH

VICTREX PEEK 450G™ polymer exhibits 2x less strain than Other PEEK at 200°C (392°F). This leads to enabling double the load-bearing capacity at the same temperature compared to other PEEK.



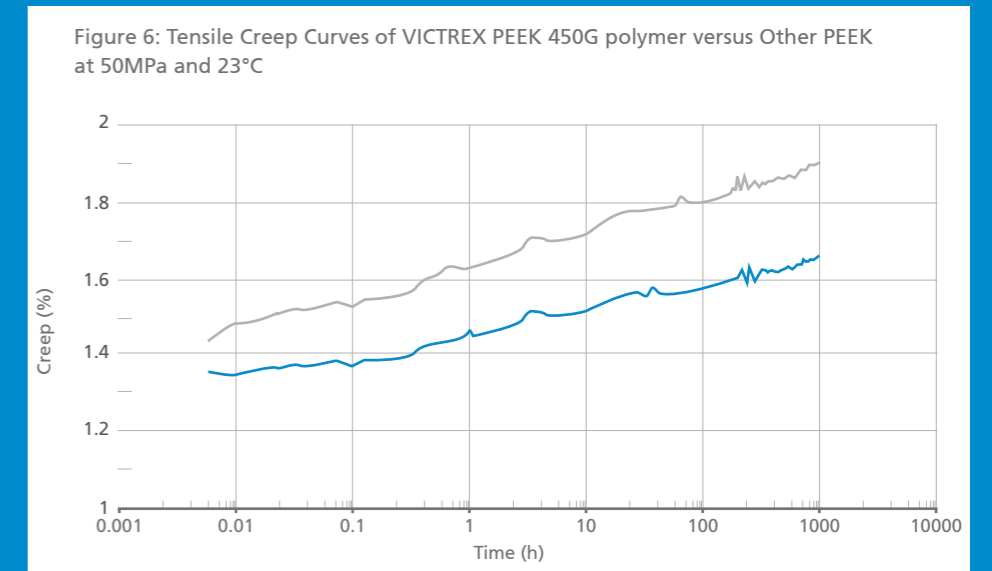
COMPRESSIVE STRESS STRAIN

VICTREX PEEK 450G polymer shows a distinct improvement in compressive strength at high temperatures compared to competitive PEEK. At 250°C (482°F), VICTREX PEEK 450G polymer exhibits half as much strain as other PEEK at equivalent loads. This means that parts made from other PEEK will deform at lower compressive loads than those made from VICTREX PEEK 450G polymer.



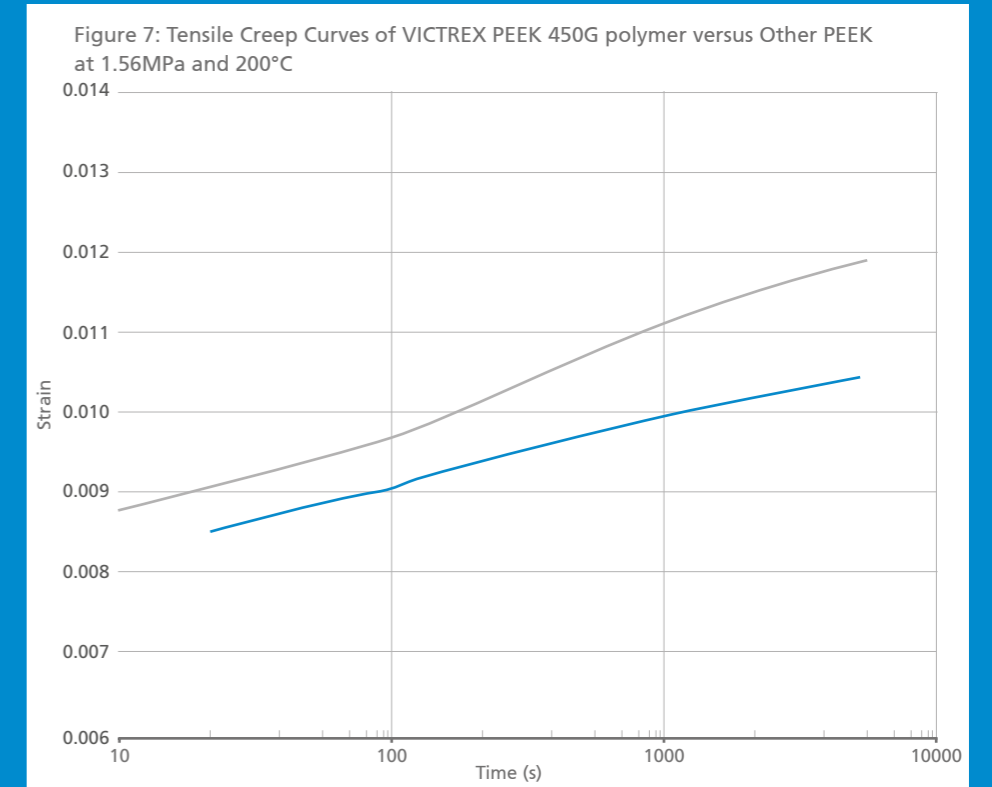
TENSILE CREEP

Other PEEK exhibits a 7x higher primary creep rate than VICTREX PEEK 450G polymer. VICTREX PEEK 450G polymer offers 15% less strain than competitive PEEK at any point in time. In a specific example, at 50MPa (7,252 psi) and 23°C (73°F), the time taken to reach a strain of 1.6% is 15 minutes for other PEEK compared to 448 hours for VICTREX PEEK 450G polymer.



HIGH TEMPERATURE CREEP

After 12 months at 200°C (392°F), the creep of VICTREX PEEK 450G polymer is calculated to be 45% lower than that of Other PEEK. This is at relatively low stress – the difference in creep is likely to increase with stress and temperature. For applications that require tight dimensional tolerances, parts made from VICTREX PEEK 450G polymer will exhibit less dimensional change under load.





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Victrex is an innovative world leader in high performance polymer solutions with products sold under the brand names of VICTREX® PEEK, VICOTE® Coatings, APTIV® film and VICTREX Pipes™. With production facilities in the UK backed by sales and distribution centers serving more than 30 countries worldwide, our global sales and technical support services work hand-in-hand with OEMs, designers and processors offering assistance in the areas of processing, design and application development to help them achieve new levels of cost savings, quality, and performance.

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