



victrex pipes™

HIGH PERFORMANCE PEEK TECHNOLOGY

## DATA SHEET

### Description

VICTREX Pipes™ are durable, lightweight pipe and tube extruded from VICTREX® PEEK polymer which offer high temperature performance and a unique combination of properties. An excellent alternative to metals, VICTREX Pipes provide chemical and corrosion resistance, low permeability, wear abrasion and impact resistance in a polymer-based pipe and tube.

Mounting performance expectations such as reliability and durability to increase service life, lighter weight for fuel efficiency and cost reduction, the ability to satisfy more stringent environmental and safety regulations combined with exposure to increasingly harsh environments are complex challenges faced by the oil and gas, aerospace and industrial segments. Material selection is critical.

Design engineers are focused on identifying new materials that provide advantages over metals and lower performing plastics in order to achieve current and future performance requirements. Representing the latest advances in both material and manufacturing technology, VICTREX Pipes are an innovative, next generation solution to deliver greater long-term reliability in extreme operating conditions.



### Benefits

- ▲ Weight reduction compared to metals
- ▲ Extended performance envelope compared to other engineering thermoplastics
- ▲ Qualification, safety and regulatory approvals
- ▲ Increased reliability and durability for extended service life
- ▲ Overall system cost reduction from lower maintenance and reduced downtime
- ▲ Non-galling, low particle generation from abrasion to eliminate damage to pump seals

### Sizes and Availability

VICTREX Pipes are available in size ranges from 6 mm (0.24 in) outer diameter (OD) to up to 200 mm (8 in) OD with wall thicknesses depending on the OD from 0.8 mm (0.03 in) up to 5 mm (0.2 in). They are available either as straight lengths or for smaller diameters in coiled lengths up to 3000 m (9842 ft). Please enquire for products outside these standard sizes and lengths.

### Regulatory Approvals

VICTREX Pipes are FDA and EU approved for food contact use and are RoHS, GADSL and 3-A Sanitary Standards compliant. VICTREX Pipes are inherently halogen-free in accordance with IEC61249-2-21. UL94 V-0 at 1.5 mm (0.06 in). VICTREX Pipes are BSE/TSE compliant and manufactured to EMEA/410/01 Rev 2. VICTREX Pipes are manufactured as part of the ISO 9001 quality management system.

### Features

- ▲ Extreme temperature range
- ▲ Aggressive chemical and corrosion resistance
- ▲ Excellent wear and abrasion performance
- ▲ High permeation resistance
- ▲ Stable mechanical properties at high temperatures
- ▲ Lightweight combined with excellent mechanical properties
- ▲ Fatigue performance
- ▲ Low smoke and toxicity
- ▲ Ductile behaviour

**High Performance and Reliability for Demanding Environments**

## Key Properties of VICTREX Pipes



### Oil and Gas

- ▲ High permeation resistance
- ▲ Chemical resistance at high temperature, properties unaffected after 2,000 hours of exposure to steam at 200°C (392°F)
- ▲ Fatigue performance
- ▲ Wear and abrasion performance
- ▲ Ductile behaviour
- ▲ Compliance to the NORSOK standard M-710 for sour (H<sub>2</sub>S) ageing



### Industrial

- ▲ Fatigue performance
- ▲ High temperature electrical insulation, stable dielectric properties over a wide range of temperatures, frequencies and humidities
- ▲ Chemical and hydrolysis resistance at high temperature
- ▲ Exceptional stability and retention of mechanical properties when exposed to high temperature humid environments including steam and sterilisation
- ▲ Wear and abrasion performance
- ▲ Excellent radiation resistance



### Aerospace

- ▲ Lightweight combined with excellent mechanical properties
- ▲ Chemical and corrosion resistance
- ▲ Low smoke and toxicity
- ▲ Environmentally friendly, halogen-free and recyclable

## PROPERTIES OF VICTREX PIPES AND TUBES

Property	Conditions	Test Method	Units	VICTREX PEEK Polymer
Tensile Modulus	23°C (73°F)	ISO 527	GPa (psi)	3.5 (507,500)
Tensile Strength	Yield, 23°C (73°F)	ISO 527	MPa (psi)	100 (14,500)
Tensile Elongation	Break, 23°C (73°F)	ISO 527	%	45
Melting Point		ISO 11357	°C (°F)	343 (649)
Glass Transition (T <sub>g</sub> )		ISO 11357	°C (°F)	143 (289)
Continuous Use Temperature	Mechanical w/o impact		°C (°F)	240 (464)
Continuous Use Temperature	Mechanical w/ impact		°C (°F)	180 (356)
Water Absorption	24 hrs, 23°C (73°F)	ISO 62-1	%	0.07
Specific Gravity (density)	Crystalline	ISO 1183	g/cm <sup>3</sup>	1.3
Coefficient of Thermal Expansion	Below T <sub>g</sub>	ASTM D696	10 <sup>-5</sup> °C <sup>-1</sup> (10 <sup>-5</sup> °F <sup>-1</sup> )	4.7 (2.6)
Coefficient of Thermal Expansion	Above T <sub>g</sub>	ASTM D696	10 <sup>-5</sup> °C <sup>-1</sup> (10 <sup>-5</sup> °F <sup>-1</sup> )	10.8 (6.0)
Abrasion	1000 cycles 1 kg load	Taber (CS10)	g	6
Rockwell Hardness	M scale	ASTM D785		99

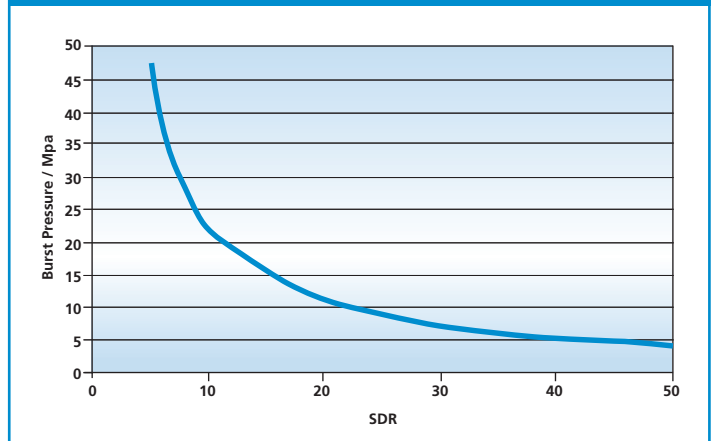
### Chemical Resistance of VICTREX PEEK Polymer

Chemical	Temperature °C (°F)	Rating
Ammonia Liquid	200 (392)	A
Acetic Acid (Conc)	200 (392)	A
Benzene	100 (212)	A
Brake Fluid (Mineral / Polyglycol)	200 (392)	A
Ethylene Glycol (50% aqueous)	200 (392)	A
Hydrochloric Acid (10%)	100 (212)	A
Hydrogen Sulfide (Gas)	200 (392)	A
Heavy Aromatic Naptha (100%)	200 (392)	B
Jet A Fuel	23 (73)	A
Methanol	100 (212)	A
Methane Gas	200 (392)	
Motor Oil	200 (392)	A
Petroleum Oils	100 (212)	A
Sea Water	200 (392)	A
Skydrol* Hydraulic Fluid	23 (73)	A
Sodium Bisulphite (50% aqueous)	200 (392)	B
Sodium Hydroxide (50%)	200 (392)	A

Ratings Description: A = No Attack B = Slight Attack  
Satisfactory use will depend on application. For more comprehensive chemical resistance data contact Victrex.

\*Skydrol is a registered trademark of Solutia Inc.

### Predicted Burst Pressure of VICTREX Pipes at 23°C (73°F) as a Function of Standard Dimension Ratio (SDR)



### Secondary Processes

VICTREX Pipes can be bent, flared and formed using heat and conventional pipe bending equipment. Additionally, VICTREX PEEK polymer-based pipes can be joined using a range of adhesives and also using conventional welding equipment. VICTREX Pipes can be laser marked by using suitable equipment.

### Storage and Handling

VICTREX Pipes should be stored in a weather tight facility in the original packaging until required for use. Although light in weight, consideration should be given to moving and handling long lengths. Tube delivered and subsequently stored in coiled lengths will have a certain amount of stored energy and care must be taken when uncoiling.

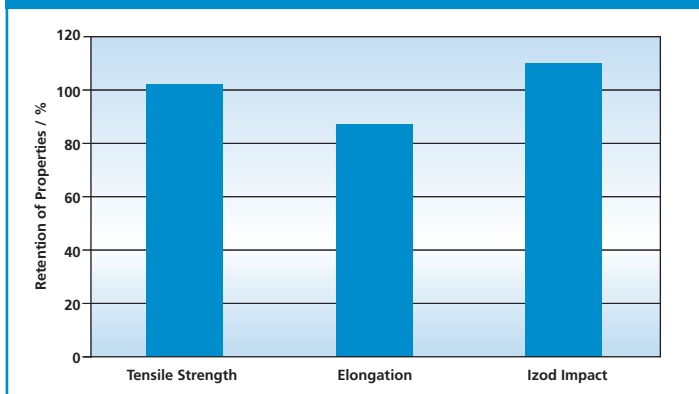
### Labelling

VICTREX Pipes are printed with the grade and date of production with a unique batch number. Coiled products and pipes delivered in straight lengths will have the same details on the outside of the packaging as is printed onto the pipes.

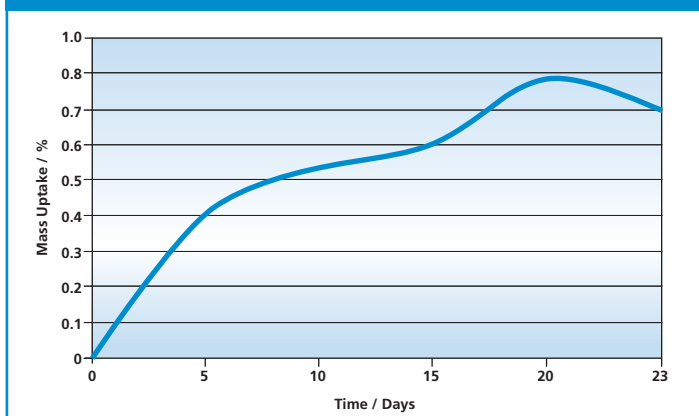
### Units of Sale

Orders for VICTREX Pipes should be placed in metres or imperial feet.

### Retention of Properties of VICTREX PEEK Polymer After Exposure to Hydrogen Sulfide Gas at 200°C (392°F) for 7 Days



### VICTREX PEEK Polymer Uptake of Brent Crude Oil at 140°C (284°F)



www.victrexpipes.com



Victrex Polymer Solutions, a division of Victrex plc, is the world's leading manufacturer of Polyaryletherketones, high performance polymers, which are sold under the brand names VICTREX® PEEK polymer, VICOTE® Coatings, APTIV® films and VICTREX Pipes™. With production facilities in the UK backed by sales and distribution centres serving more than 30 countries worldwide, our global market development, 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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