

MAKING THE GRADE IN FOOD CONTACT APPLICATIONS

NEXT GENERATION SOLUTIONS WITH
VICTREX™ PEEK POLYMERS

DELIVERING TOMORROW'S GENERATION OF FOOD GRADE SOLUTIONS. TODAY.

With increasing demands around health and safety, hygiene and productivity, the pressures being faced by food and beverage manufacturing equipment companies are mounting. Food contact legislation. Cleaning processes. Equipment performance. Precision. Efficiency. Improvements need to be made without compromise to reliability, costs or output.

Therefore, developing the next generation of food manufacturing equipment is a complex challenge. It requires modern materials and close collaboration between product and design engineers to develop cost-effective, innovative solutions that make the grade in terms of performance and regulatory approval.

Victrex has been helping food manufacturing companies work with thermoplastics for more than two decades. Delivering high-performance solutions that can improve the reliability, efficiency and cost-effectiveness of food contact components, to help solve current challenges in processes from milling and mixing, to boiling, frying and freezing.

In combining food contact approved VICTREX™ PEEK polymer-based solutions with our in-depth material, processing and application know-how, we help you address your most pressing challenges and bring your food contact solutions to market faster and with more confidence.



SHAPING FOOD CONTACT APPLICATIONS

From the smallest components to whole processes, Victrex PEEK-based solutions are used throughout the food, beverage and water contact world.

These solutions can help to reduce component costs – for example through replacing metal components with the mass production of complex, resilient, injection-moulded components that require no further processing or machining.

Typical applications include:



▲ COMMERCIAL & DOMESTIC

- Ovens
- Cookware; fryers & rice cookers
- Fridges
- Beverage dispensers

▲ INDUSTRIAL

- Conveyor systems
- Aseptic processing & packaging
- Bottling and filling lines
- Meat, Poultry, Fish & Dairy
- Filtration
- CIP equipment



DELIVERING REGULATORY COMPLIANCE

The regulatory landscape is becoming increasingly complex, to protect the consumer and implement social and environmental standards. Combined with regulatory requirements in food, drink and potable water being constantly updated and becoming more stringent, it is challenging to keep up to speed on which materials can and cannot be used.

To bring clarity, we work closely with industry and regulatory bodies, undertaking our own advanced research and development, testing and securing the relevant certifications under, for example EU regulations, U.S. Food and Drug Administration (FDA), UK Water Regulations Advisory Scheme Ltd (WRAS), KTW and the 3-A Sanitary Standard.

We understand that your products simply have to work, within the regulatory landscape of today and tomorrow. So we can help at each stage of the product lifecycle, to not just keep your machines working overtime, but to help you realise opportunities, by bringing new products to market, safely and quickly.



VICTREX FG™ REGULATORY COMPLIANCE GRID

VICTREX FG™ series of VICTREX™ PEEK products are certified to major regional food contact regulatory standards. Safe in the knowledge that the materials comply with the strictest regulatory requirements, the portfolio offers design freedom to product managers, designers, engineers and plant managers.

Grade	Colour	Filler	WATER		
			WRAS (UK)	KTW (GER)	KTW (GER)
				KTW guideline	DVGW W270 micro
VICTREX FG™ 100	Natural	Unfilled	●	●	●
VICTREX FG™ 101	Black	Unfilled	●	●	●
VICTREX FG™ 120	Natural	Glass	●	●	●
VICTREX FG™ 121	Black	Glass	●	●	●
VICTREX FG™ 140	Black	Carbon Fibre	●	○ Nov 19	○ Nov 19
VICTREX FG™ 200	Natural	Unfilled	●	●	●
VICTREX FG™ 201	Black	Unfilled	●	●	●
VICTREX FG™ 220	Natural	Glass	●	●	●
VICTREX FG™ 221	Black	Glass	●	●	●
VICTREX FG™ 240	Black	Carbon Fibre	●	○ Nov 19	○ Nov 19
VICTREX FG™ 300	Natural	Unfilled	●	●	●
VICTREX FG™ 301	Black	Unfilled	●	●	●
VICTREX FG™ 320	Black	Wear Additives	●	○ Nov 19	○ Nov 19
VICTREX FG™ 325	Natural	Wear Additives	●	●	●
VICTREX FG™ 340	Black	Wear Additives	●	○ Nov 19	○ Nov 19
VICTREX FG™ 400	Natural	Unfilled	●	●	●

FOOD				
FDA (US)	EU (UK/Europe)	China	South America	NSF 51 (US)
21 CFR 177.2415	EU 10/2011	GB4806.6 / GB 9685	Mercosur GMC RES 02/12; 32/07; 32/10	
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	○ Dec 19	●	○ Dec 19	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	○ Dec 19	●	○ Dec 19	●
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●	●	●	●	●
●	○ Dec 19	●	○ Dec 19	●
●	●	●	●	●
●	○ Dec 19	●	○ Dec 19	●
●	●	●	●	●

● Complies ○ Approval Pending ● Currently Not Approved

VICTREX FG™ PRODUCT FAMILY

VICTREX FG™ meets the most stringent food contact material requirements (including safety, quality and regulatory compliance) of the industry – to ensure that customers only taste what they are supposed to taste.

Product portfolio overview

FILLER		100 SERIES	200 SERIES	PERFORMANCE	
		Strong & stiff enough to replace metal & stay in shape.	Tough & ductile enough to withstand hard knocks.		
CARBON FIBRE		VICTREX FG™ 140	VICTREX FG™ 240	BEST	WEAR ADDITIVES
GLASS		VICTREX FG™ 121	VICTREX FG™ 221	BETTER	WEAR ADDITIVES
		VICTREX FG™ 120	VICTREX FG™ 220		WEAR ADDITIVES
UNFILLED		VICTREX FG™ 101	VICTREX FG™ 201	GOOD	UNFILLED
		VICTREX FG™ 100	VICTREX FG™ 200		UNFILLED
					300 SERIES
					Resilient enough to reduce friction & wear, extending component lifetime.
					VICTREX FG™ 340
					VICTREX FG™ 325
					VICTREX FG™ 320
					VICTREX FG™ 301
					VICTREX FG™ 300



EXPERIENCE THE BENEFITS

Victrex works with a wide spectrum of food and beverage customers to solve complex challenges and provide certified food contact materials for the most exacting conditions. From cereal conveyor systems and power unit engines, to cutter tool manufacturers in confectionery production. From drinks production component providers to industrial cleaning equipment manufacturers. We are helping to upgrade performance, efficiency and cost-effectiveness in demanding food grade environments.



WE ARE THE #1 EXPERTS IN PEEK

Our expertise enables us to support every stage of application development, helping manufacturers bring new products to market, safely and quickly.



WE PIONEER TO HELP IMPROVE PERFORMANCE

We are helping customers improve the chemical resistance and purity of their critical food contact applications while providing compliance with food and water standards, including EU, FDA, 3-A and WRAS.



WE COLLABORATE TO DRIVE COSTS DOWN

We partner with OEMs and Tier 1s to reduce component cost and improve performance, through identifying where they can gain most advantage in replacing metal with PEEK.



HIGH PERFORMANCE PRODUCT PORTFOLIO

With over 35 years of PEEK polymer knowledge, Victrex works with customers to design new solutions – often replacing metal – to improve manufacturing performance, reduce costs and meet the unique needs of food contact environments.

Today, manufacturers are adopting high performance polymers to meet their needs in demanding applications.

POLYMERS,
FORMS,
PARTS.



▲ VICTREX™ PEEK POLYMER

The ideal metal replacement material, VICTREX PEEK is durable and reliable. Enabling optimum component design and performance across a range of next-generation food grade applications.

70% lighter vs. steel
55% lighter vs. titanium
40% lighter vs. aluminium

Injection moulding unfilled, carbon-fibre reinforced, and glass-filled grades

Proprietary grades available to achieve high mechanical strength, minimal wear and extreme temperature resistance



▲ VICOTE™ COATINGS

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

A one-coat system for a smooth, uniform surface

Excellent resistance to wear, abrasion, extreme temperature, creep, and chemicals

Halogen-free with no additives



▲ ZYEX™ FIBRES

ZYEX PEEK fibre is the thermoplastic fibre of choice for tough environments. Its resistance to high temperatures and a wide range of chemicals, together with its excellent abrasion resistance at high temperatures make PEEK fibres an excellent choice for e.g. filtration applications, conveyors and composites.

Monofilament, multifilament, staple and cut fibres

Available in diameters from 10 to 2000 microns



▲ APTIV™ FILMS

Take advantage of the properties of VICTREX PEEK in a thin film format for demanding applications. By offering excellent mechanical, thermal and electrical properties, APTIV Film allows for cost-effective, reliable insulation solutions.

Superior mechanical and dielectric strength

Excellent thermal conductivity

Available in thicknesses from 5 to 750 microns



▲ VICTREX GEAR SOLUTIONS

Benefit from a 360° system approach spanning from material selection through gear design to mass production of precision-moulded state-of-the-art gears that meet highest requirements and can deliver a range of benefits.

Accelerate time to market with integrated process

68% lighter vs. cast iron gears

Cost saving potential vs. metal scissor gears

OVERCOMING MARKET CHALLENGES

The inefficiencies inherent with many existing food and beverage manufacturing practices and components often mean that a diverse range of costly and complex challenges must be overcome to ensure production can reach and maintain optimum efficiency at the lowest possible lifetime cost.

- ▲ **Machining / components requiring frequent maintenance**
- ▲ **Metal components being susceptible to contamination and flaking**
- ▲ **Component deterioration through exposure to extreme temperatures and chemical damage**
- ▲ **Contamination from lubricants necessary for moving parts**
- ▲ **Staining and other issues associated with maintaining aesthetics**

VICTREX™ PEEK polymers

One of the highest performing polymers in the world, VICTREX PEEK is ideally suited to these extreme, demanding environments. Whilst alternative materials can meet some needs, PEEK supports multiple requirements simultaneously:

- | | | |
|---|---|---|
|  Extreme-Temperature Performance
Allowing continuous operation in temperatures of 260°C and up to 300°C for short-term usage |  Wear Properties
High abrasion and cut through resistance combined with a low friction coefficient |  Hydrolysis Resistance
Low moisture absorption, resistant to steam, with low permeability |
|  Purity
Exceptional high purity |  Light Weight
Enabling reduced mass and lower energy consumption, improved efficiency and cost reduction |  Easy Processing
1-shot injection moulding process allows for optimised part design and eliminates the need for secondary processing steps and saves labour, space, machine invest |
|  Chemical Resistance
Resistant to aggressive cleaning agents and processes, insoluble in all common solvents |  Regulatory Approvals
Appropriate food and water certification |  Electrical Properties
Maintained over a wide frequency and temperature range, improved dielectric strength vs. PI/PTFE |
|  Mechanical Strength
Excellent strength, dimensional stability and stiffness as well as long-term creep and fatigue properties |  Environmental Friendliness
Fully recyclable, halogen-free and RoHS and REACH compliant. Chemically inert to water and pressurised steam | |

VICTREX™ PEEK polymers can move manufacturing processes and productivity to the top of the food chain.

Chemical Resistance

VICTREX™ PEEK polymers deliver resistance for common chemicals* found in food and beverage processing.

CHEMICAL	23°C (73°F)	100°C (212°F)	200°C (392°F)	MISCELLANEOUS	23°C (73°F)	200°C (392°F)
Acetic Acid, 10% Conc.	A	A		Apple Juice	A	
Acetic Acid, Conc.	A	A	A	Beer	A	A
Acetic Acid, Glacial	A	A		Fatty Acids	A	A
Ammonium Chloride, 10% Conc.	A	A		Fruit Juice	A	A
Chlorine	C	C	C	Ketchup	A	
Citric Acid	A	A		Milk	A	A
Diethyl Phthalate	A			Mineral Oil	A	
Hydrochloric Acid, 10% Conc.	A	A		Molasses	A	A
Hydrochloric Acid, Conc.	A	B		Peanut Oil	A	A
Hydrocyanic Acid	A	A		Vinegar	A	A
Iodine	B			Wines and Spirits	A	A
Lactic Acid	A	A		Yeast	A	
Magnesium Chloride	A	A				
Magnesium Hydroxide	A					
Nitric Acid, 10% Conc.	A					
Nitric Acid, 30% Conc.	B					
Nitric Acid, 50% Conc.	C	C	C			
Nitric Acid, Conc.	C	C	C			
Phosphoric Acid, 10% Conc.	A	A	A			
Phosphoric Acid, 50% Conc.	A	A	A			
Phosphoric Acid, 80% Conc.	A	A				
Potassium Carbonate	A					
Potassium Hydroxide, 10% Conc.	A					
Potassium Hydroxide, 70% Conc.	A					
Sodium Hydroxide, 10% Conc.	A	A	A			
Sodium Hydroxide, 50% Conc.	A	A	A			
Sodium Hydroxide, Conc.	A					

KEY

- A — **No attack.**
Little or no absorption.
- B — **Slight attack.**
Satisfactory use of VICTREX PEEK will depend on the application.
- C — **Severe attack.**
It is recommended that VICTREX PEEK should not be used for any application where these chemicals are present.

*For the complete list of all chemicals, contact Victrex and request the Chemical Resistance brochure.



HEADQUARTERS

Victrex plc
Hillhouse International
Thornton Cleveleys
Lancashire FY5 4QD
United Kingdom

TEL + (44) 1253 897700
FAX + (44) 1253 897701
victrexplc@victrex.com

AMERICAS

Victrex USA Inc
300 Conshohocken State Road
Suite 120
West Conshohocken, PA 19428
USA

TEL + (1) 484 342 6001
FAX + (1) 484 342 6002
americas@victrex.com

EUROPE

Victrex Europa GmbH
Langgasse 16
65719 Hofheim/Ts.
Germany

TEL + (49) 6192 96490
FAX + (49) 6192 964948
customerservice@victrex.com

JAPAN

Victrex Japan, Inc.
Mita Kokusai Building Annex
4-28, Mita 1-chome
Minato-ku
Tokyo 108-0073
Japan

TEL + 81 (0)3 5427 4650
FAX + 81 (0)3 5427 4651
japansales@victrex.com

ASIA PACIFIC

**Victrex High-Performance
Materials (Shanghai) Co Ltd**
Part B Building G
No. 1688 Zhuanxing Road
Xinzhuan Industry Park
Shanghai 201108
China

TEL + (86) 21 6113 6900
FAX + (86) 21 6113 6901
scsales@victrex.com

As a global high-performance polymer solutions provider, Victrex serves more than 40 geographies worldwide across the automotive, aerospace, medical, electronics, industrial and energy markets. VICTREX™ PEEK is regarded as one of the highest performing engineering thermoplastics in the world, and is used by leading companies to develop fuel-efficient automobiles and aeroplanes, advanced medical devices, next generation technology and tools for the harshest environments.

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