



# MAKING THE GRADE IN **COFFEE MACHINE** 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 compliance.

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



# SHAPING COFFEE CONTACT APPLICATIONS

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

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

## Typical applications include:



### ▲ FLUID DISPENSING

- Flow meters & sensors
- Nozzles and dispensers
- Piercing devices
- Check valves & solenoids
- CIP equipment
- Frothing wand

### ▲ FLUID HANDLING

- Pumps & drive gears
- Filters
- Fittings, junctions & seals
- Pipes & hoses
- Reservoirs
- Bushing & bearings
- Non-stick coatings



# DELIVERING REGULATORY COMPLIANCE

The regulatory landscape is becoming increasingly complex to protect the consumer by implementing 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 and regulatory compliance under, for example EU regulations, U.S. Food and Drug Administration (FDA) regulations, UK Water Regulations Advisory Scheme Ltd (WRAS), KTW-BWGL 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 are compliant with major food and water contact regulations and standards. Safe in the knowledge that these materials comply with applicable regulatory requirements, product managers, designers, engineers and project managers can use the series to facilitate their design choices.

Grade	Colour	Filler	FOOD					WATER		
			FDA (US)	EU (Europe)	China	Japan	NSF 51 (US)	WRAS (UK)	KTW (GER)	NSF 61 (US)
			21 CFR 177.2415	EU 10/2011	GB 4806.6, GB 4806.7	MHLW Food Sanitation Act			KTW-BWGL	
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	●			●	●	●		●
VICTREX FG™ 200	Natural	Unfilled	●	●	●	●	●	●	●	●
VICTREX FG™ 201	Black	Unfilled	●	●	●	●	●	●	●	●
VICTREX FG™ 240	Black	Carbon Fibre	●			●	●	●		●
VICTREX FG™ 340	Black	Carbon Fibre	●			●	●	●		●
VICTREX FG™ 700	Natural (white)	Unfilled	●	●	●	●				

Updated as of January 2024. This is to provide a brief summary of regulatory compliance of VICTREX FG™ product family and is subject to update

● Complies

# PFAS-FREE VICTREX FG™ POLYMERS

Known for their water-resistance and non-stick properties, PFAS (Per- and polyfluoroalkyl substances) are a group of chemicals used to make fluoropolymer coatings and products. Found in cosmetics, cookware, clothing, furniture, firefighting foams, and products that resist grease, water, and oil – they are part of our everyday lives.

Considered “forever chemicals” their persistence in the environment poses a significant risk. PFAS including compounds like PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulfonic), do not break down and risk contaminating our food and water, which may lead to health issues.

PFAS have not been intentionally added, used or generated as by-products in the manufacturing process of VICTREX FG™ polymers. VICTREX FG series is a range of high-performance PEEK-based polymers compliant with major food and water contact regulations and standards – including FDA, EU10/2011, WRAS and KTW.



# VICTREX FG™ PRODUCT FAMILY

VICTREX FG™ series are compliant with major food and water contact regulations and standards. Safe in the knowledge that these materials comply with applicable regulatory requirements, product managers, designers, engineers and project managers can use the series to facilitate their design choices.

## Product portfolio overview

	100 SERIES	200 SERIES	300 SERIES	700 series
	Strong & stiff enough to replace metal & stay in shape in extreme environments.	Tough & ductile enough to withstand hard knocks in demanding environments.	Resilient enough to reduce friction & wear, extending component lifetime in challenging environments.	Powder coating grade suitable for aqueous dispersions. PEEK-based materials can offer chemical, scratch & wear resistance
UNFILLED	VICTREX FG™ 101	VICTREX FG™ 201		
	VICTREX FG™ 100	VICTREX FG™ 200		VICTREX FG™ 700
GLASS FIBRE	VICTREX FG™ 120			
	VICTREX FG™ 121			
CARBON FIBRE	VICTREX FG™ 140	VICTREX FG™ 240	VICTREX FG™ 340	



# 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

POLYMERS,  
FORMS,  
PARTS.

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 coffee contact environments.

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



## ▲ 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 coffee 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

\*VICTREX™ products have been shown through type testing to meet the criteria of 'non-halogenated' as defined in IEC standard – IEC 61249-2-21

# OVERCOMING MARKET CHALLENGES

The inefficiencies inherent with many existing coffee 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:

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

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

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## 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.



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#### About Victrex

Victrex is an innovative world leader in high performance polymer solutions, focused on the strategic markets of automotive, aerospace, energy, manufacturing & engineering, electronics and medical. Every day, millions of people use products and applications, which contain our materials – from smart phones, aeroplanes and cars to oil and gas operations and medical devices. With over 40 years' experience, we develop world leading solutions in PEEK and PAEK-based polymers, semi-finished and finished parts which shape future performance for our customers and our markets, and drive value for our shareholders. Find out more at [www.victrex.com](http://www.victrex.com)

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