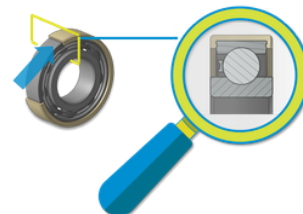


# VICTREX™ PEEK BEARING INSULATION IN HIGH-VOLTAGE ELECTRIC MOTORS

## Why bearing insulation matters

Reliable insulation of bearings is key to ensure efficient performance over the component lifetime. Electrification is raising the bar, and VICTREX™ PEEK based insulation can meet the demanding requirements in these critical application spaces.

- ▶ Variable-frequency drive switching creates high-frequency CMV, leading to common mode current (CMC) through machine bearings.
- ▶ High-energy CMC pulses can cause erosion by electrical discharge machining (EDM), transferring metal to the lubricant.
- ▶ To prevent damage, appropriate earthing paths must return stray currents to the inverter frame without passing through bearings.
- ▶ Using symmetrical motor cables, inverter output filtering, and proper bearing insulation can reduce and break current paths.



## VICTREX™ PEEK PROPERTIES

VICTREX PEEK polymer is regarded as one of the highest-performing engineering thermoplastics in the world. It's the specified powerhouse of performance, delivering multiple engineering requirements - from resistance to high temperature, harsh chemicals, wear, to mechanical strength, electrical properties, and more - all with one polymer.

It has been helping engineers solve complex engineering challenges for more than 40 years - often resulting in replacing metal and other polymers.



### Electrical Insulation

Dielectric Strength up to 23kV/mm at 2mm



### Extreme Temperature

Electrical Resistance from -40°C to 260°C and even higher for short durations to handle most motor temperatures



### Chemical Resistance

Compatible and reliable in a wide range of automotive fluids



### Easy Processing

A range of products and processing options to meet your design requirements

## VICTREX™ PEEK Insulated Ball Bearing Concepts

**Bespoke Raceway**  
(0.5-1mm undersize on outer faces)

1

**Glass-Fibre Reinforced PEEK Overmould**  
(min. 1.5 mm thick)

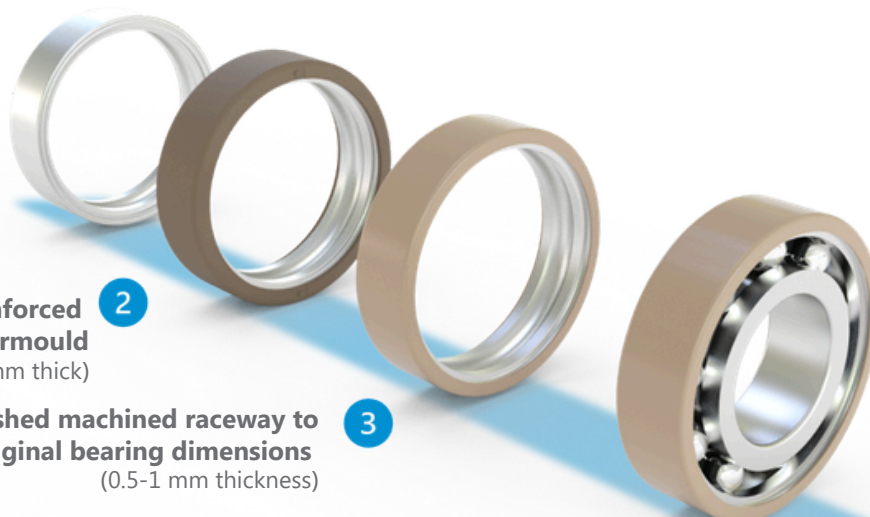
2

**Finished machined raceway to original bearing dimensions**  
(0.5-1 mm thickness)

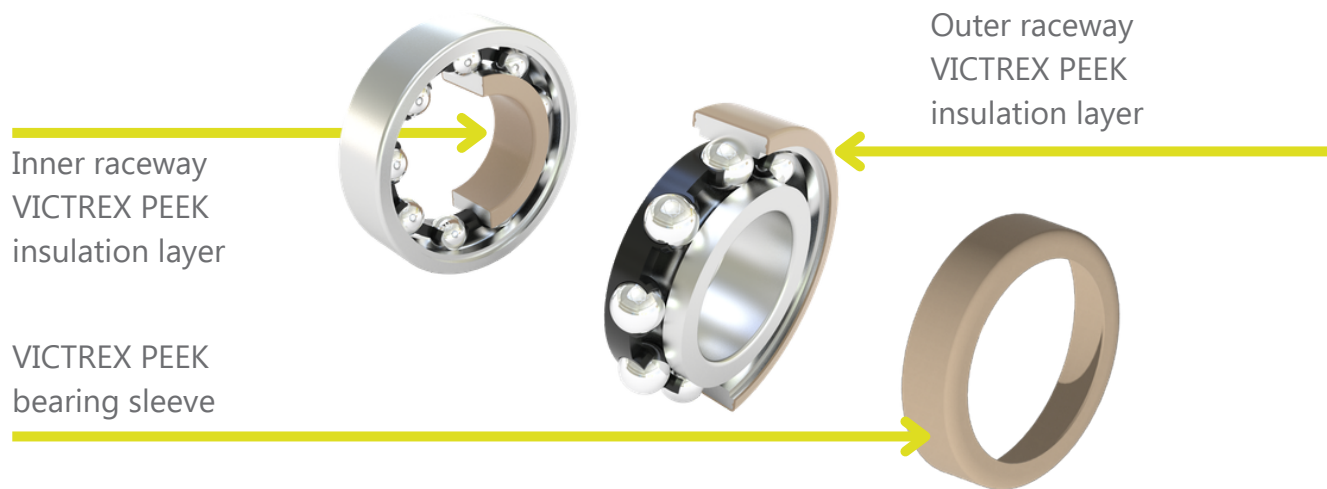
3

**Overmoulded Raceway assembled into full bearing**

4

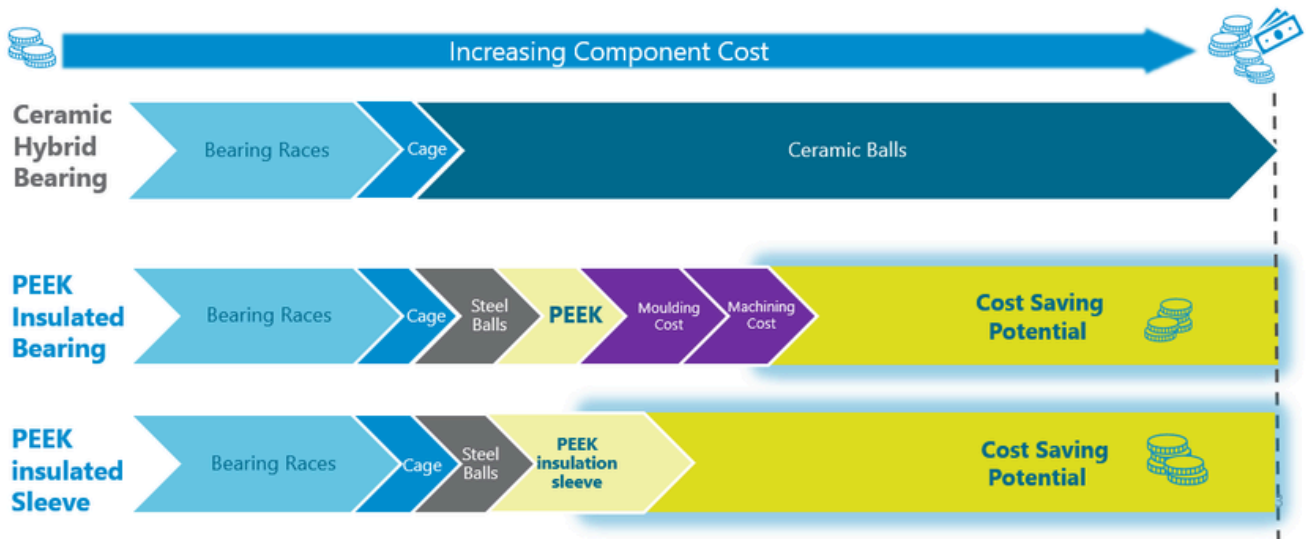


## Alternative PEEK Insulation Layer Options



## Illustrative Cost Models

Using VICTREX PEEK in insulated bearings offers reliable electrical insulation with potential cost advantages in e-motor applications versus ceramic hybrid options.

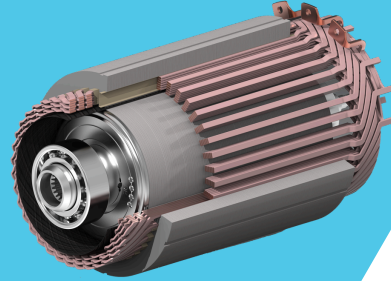


Talk to us if you are evaluating insulation options for a high-voltage e-motor platform. With 40+ years of experience we are the #1 PEEK experts and would love to support you with your next development.

**CONTACT US**

**We bring transformational & sustainable solutions that address world material challenges every day**

**#1  
PEEK  
Expert**



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