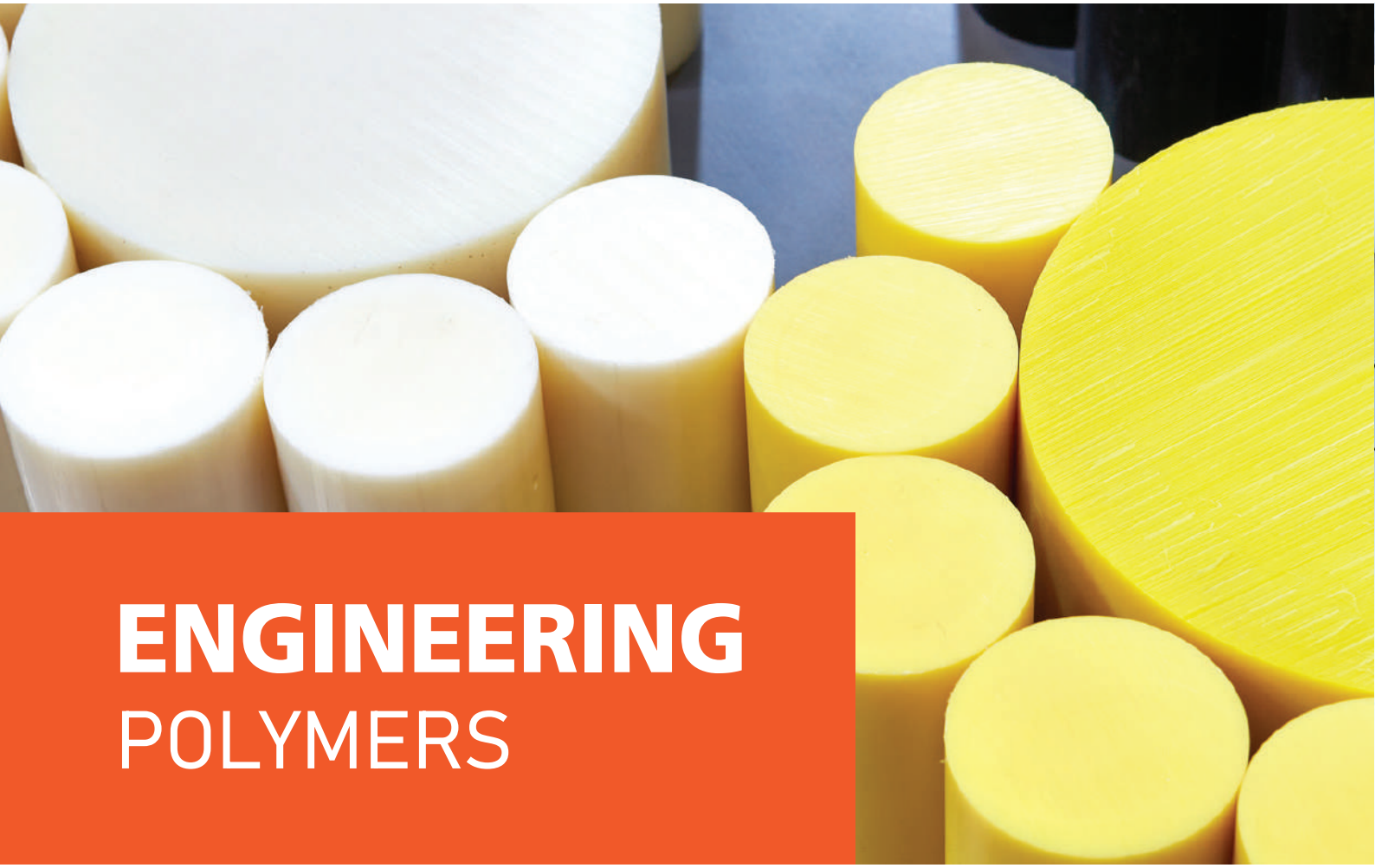
OPI



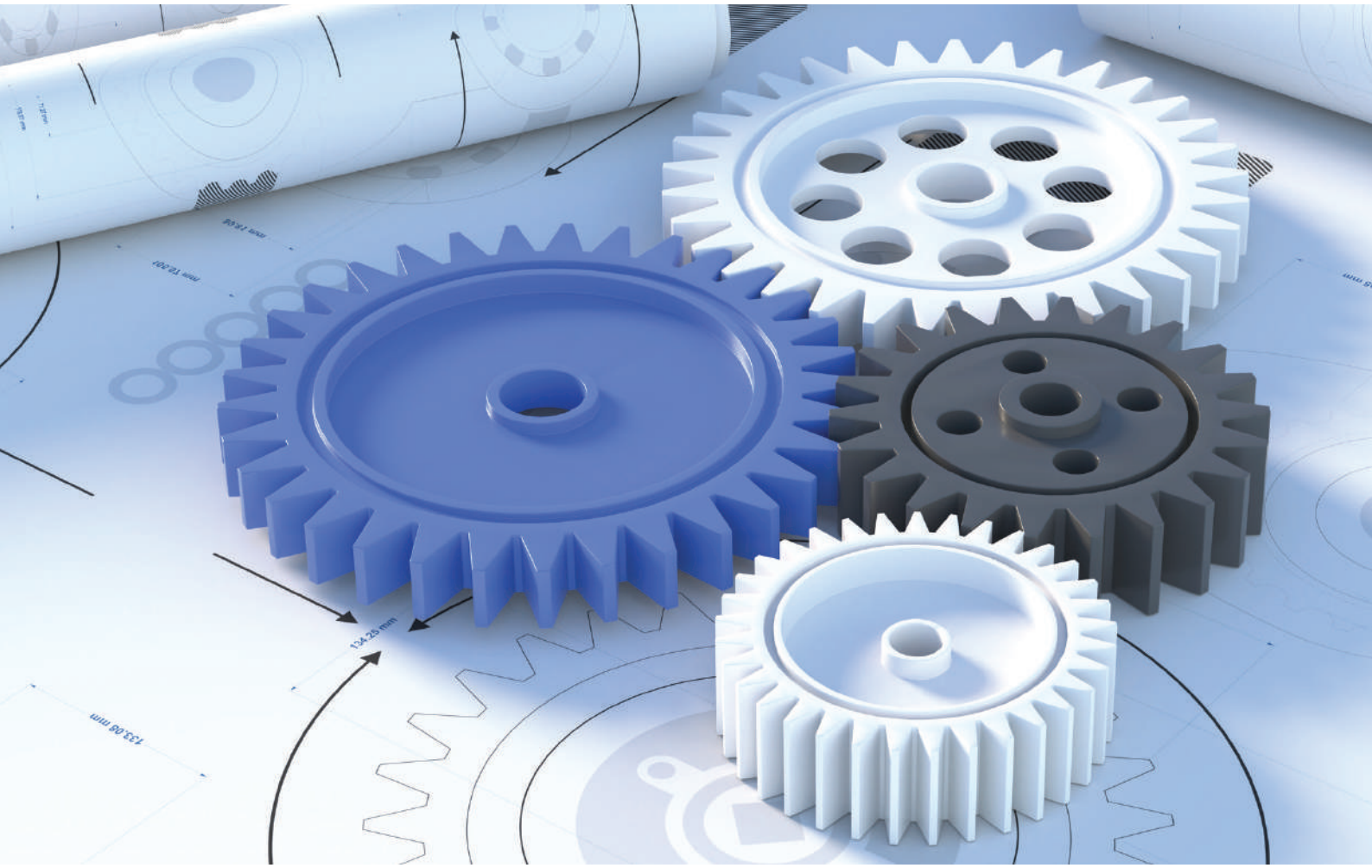
ENGINEERING
POLYMERS

POLYTETRAFLUOROETHYLENE (PTFE)

ULTEM1000

PEEK

NEOPRENE

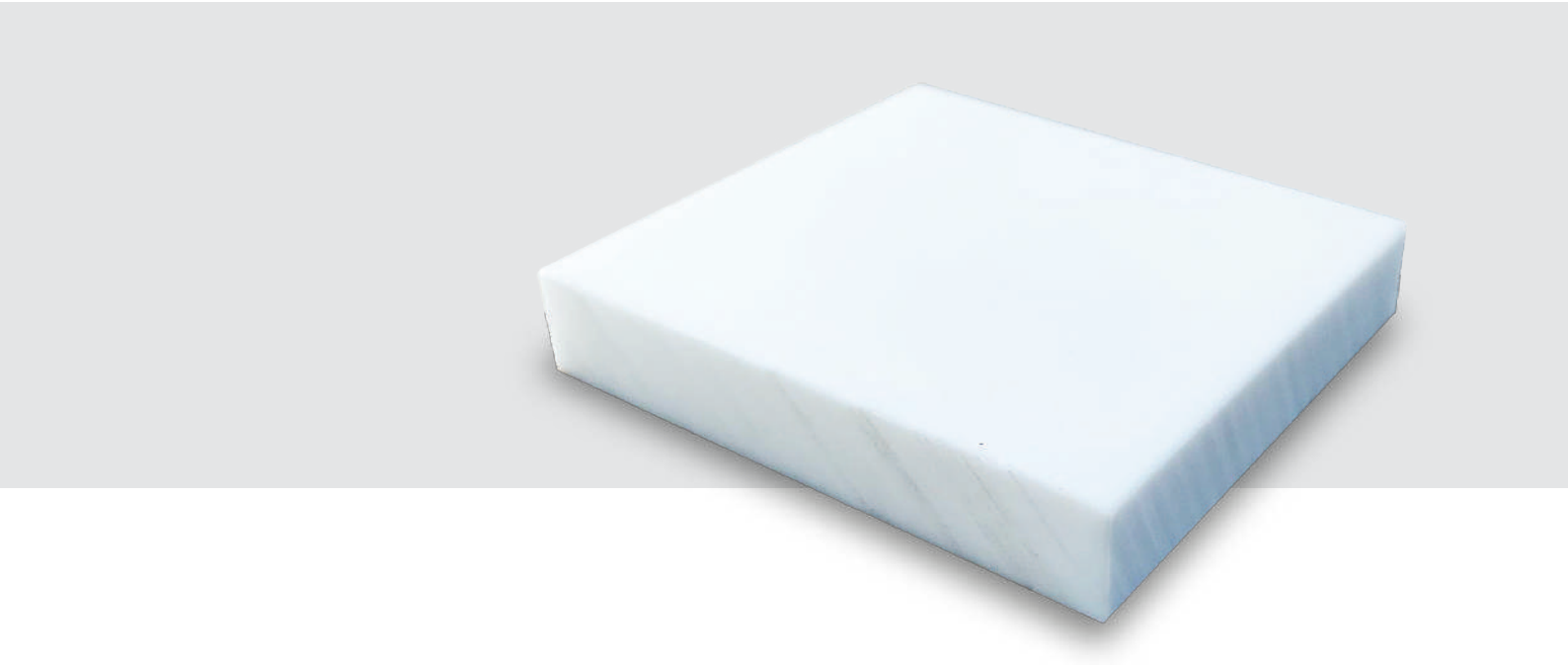


In the complex world of special engineering materials, the important role of engineering plastics cannot be overstated. Among the types that are frequently used in this group **Polytretafluoroethylene (PTFE), Ultem 1000 and Polyetheretherketone (PEEK)** stand out in OPI sector application. In exploring the advantages of this kind of Engineering Plastics, we embark into the remarkable realm of **PTFE, Ultem 1000 and PEEK** revealing their profound impact on a wide range of industries. We are able to provide these kind of advance engineering plastic in various form factor :

Flat sheet, Flat bar, Round bar, D-ROD, O-ROD
and custom size as client requirement (by CNC machining).

PTFE

(POLYTETRAFLUOROETHYLENE)



Advantages :

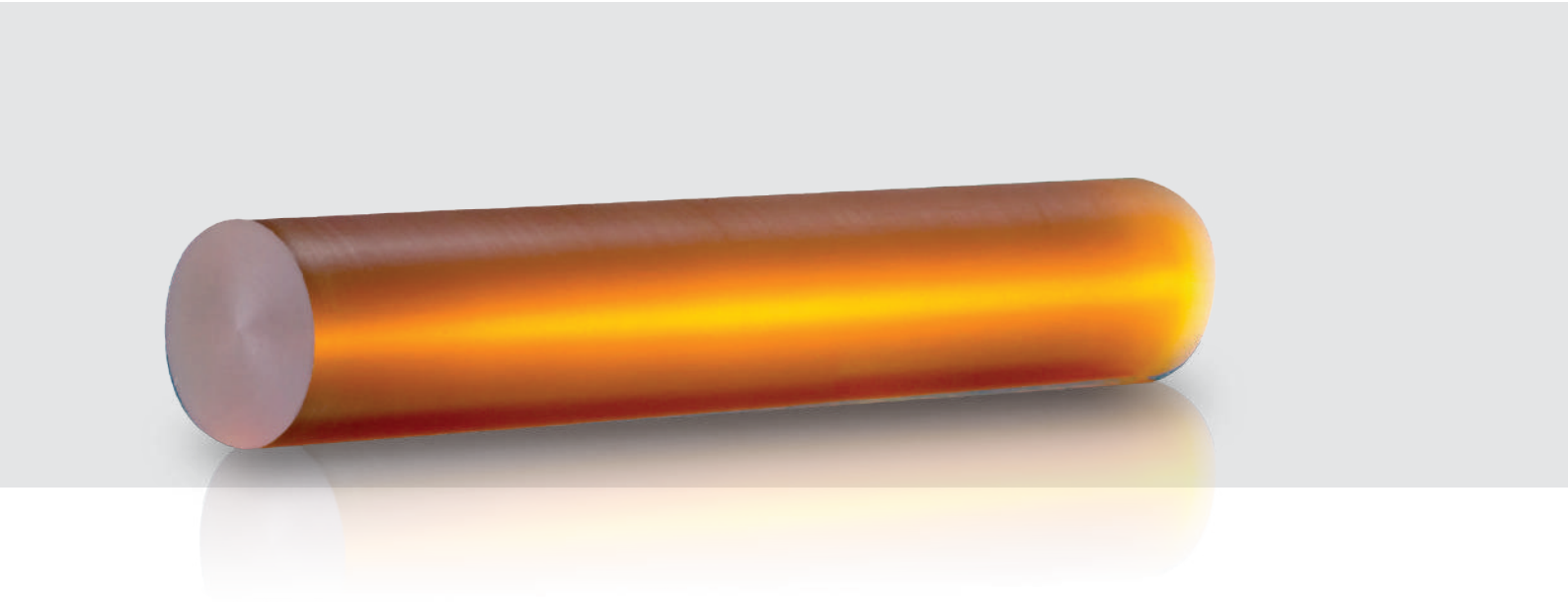
- Exceptional chemical resistance: PTFE is highly resistant to a wide range of chemicals, making it suitable for corrosive environments.
- Low friction: PTFE has one of the lowest coefficients of friction among solid materials, making it an excellent choice for applications involving sliding or rotating components.
- High temperature resistance: PTFE can withstand a wide temperature range, making it suitable for use in both high and low-temperature applications.

Applications :

- Seals and gaskets: PTFE's low friction and chemical resistance make it ideal for sealing applications in industrial settings.
- Bearings and bushings: Its low friction properties make PTFE suitable for use in bearings and bushings in various industries.
- Electrical insulation: PTFE is an excellent electrical insulator, making it suitable for use in wiring and cable applications.

We also use PTFE ROD in our YU-Bolt (Category A)

ULTEM 1000



Advantages :

- High strength and rigidity: Ultem 1000 offers excellent mechanical properties, including high strength and rigidity.
- Dimensional stability: It maintains its shape and properties over a wide temperature range, providing stability in different environments.
- Flame resistance: Ultem 1000 has excellent flame resistance, making it suitable for applications with stringent fire safety requirements.

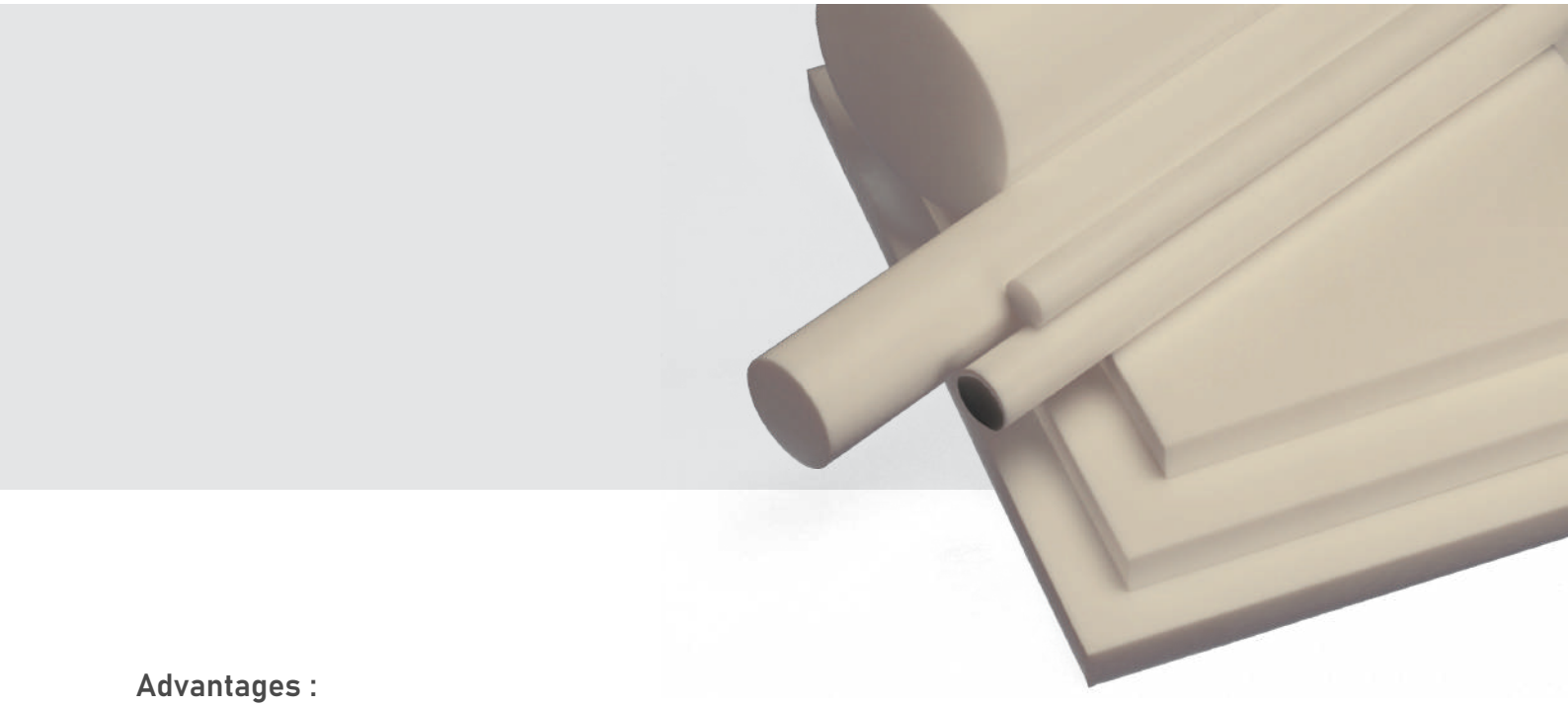
Applications :

- Carthodic protection for pipeline.
- Aerospace components: Ultem 1000 combination of high strength and flame resistance which makes it suitable for aerospace applications.
- Medical devices: Its biocompatibility and resistance to steam sterilization make it suitable for medical device components.
- Machine and Electrical components: Ultem 1000 is used in electrical and electronic applications due to its high dielectric strength and dimensional stability.

We also use ULTEM1000 ROD in our YU-Bolt (Category A)

PEEK

POLYETHERETHERKETONE



Advantages :

- Very high temperature resistance: PEEK can withstand high temperatures without significant loss of mechanical properties.
- Chemical resistance: It is resistant to a wide range of chemicals, making it suitable for aggressive environments.
- High mechanical strength: PEEK offers high tensile strength and stiffness, making it suitable for structural applications.

Applications :

- Oil and gas components: PEEK's chemical resistance and high temperature stability make it suitable for components in the oil and gas industry.
- Aerospace and automotive components: PEEK's combination of high strength and temperature resistance makes it suitable for critical components in aerospace and automotive industries.
- Medical implants: PEEK's biocompatibility and resistance to sterilization methods make it suitable for certain medical implant applications.

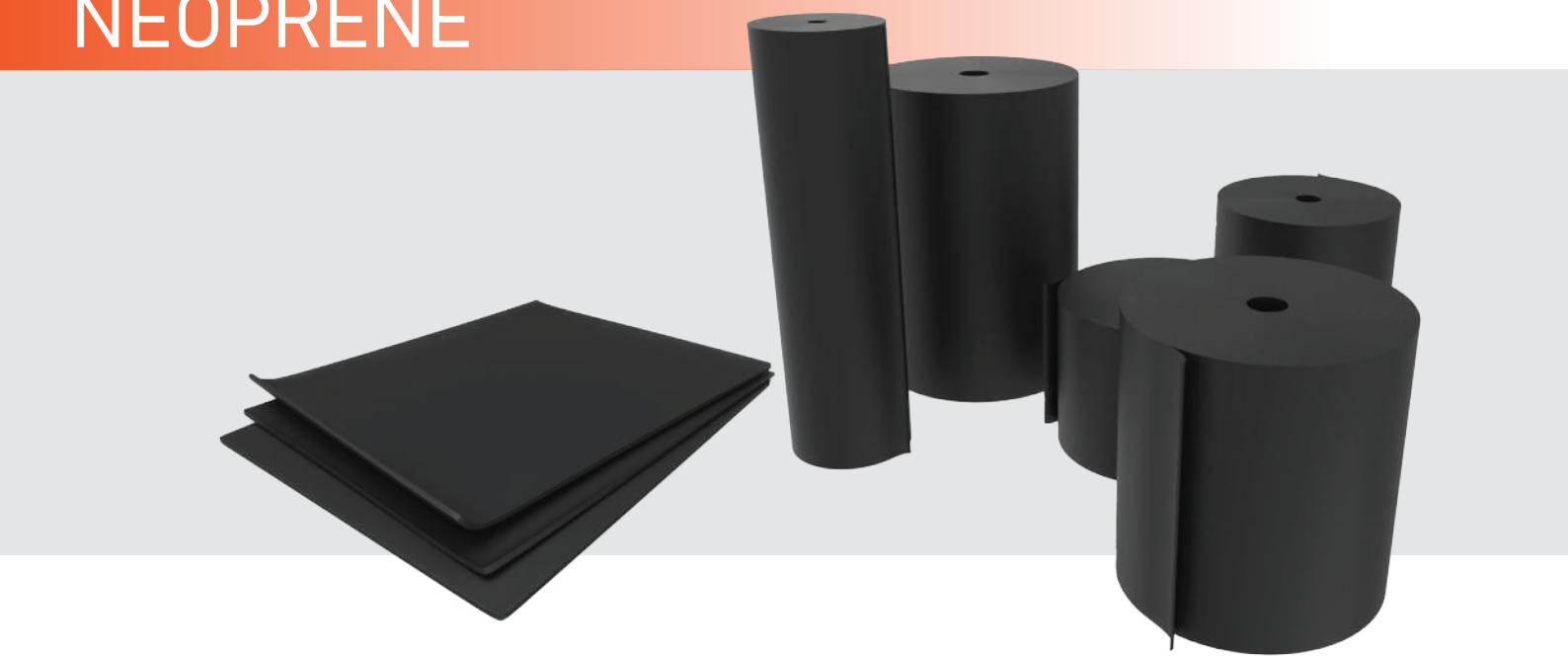
We also use PEEK ROD in our YU-Bolt (Category A)

Physical and thermal properties

ADVANTAGES	APPLICATIONS INCLUDE
Excellent Tensile and Flexural strength	Semiconductor
Inherent flame resistance	Surgical Probes
Broad chemical resistance	Pump Housings
Very good dimensional stability	Water Processing
U.V. stable	
FDA Compliant	

GENERAL PROPERTIES	Units	ASTM	PTFE	ULTEM1000	PEEK
Specific Gravity	g/cm^3 - ib/in^3	D792	2.16/0.078	1.27/0.045	1.30/0.047
Water Absorption, 24 hrs	%	D570	<0.01	0.25	0.1
MECHANICAL PROPERTIES					
Tensile strength	psi	D638	3,900	15,200	16,000
Tensile modulus	psi	D638	80,000	430,000	500,000
Tensile Elongation @ Break	%	D638	300	7	20
Flexural strength	psi	D790	-	22,000	25,000
Flexural modulus	psi	D790	72,000	480,000	600,000
Compressive strength	psi	D695	3,500	21,000	20,000
Compressive modulus	psi	D695	70,000	480,000	50,000
Hardness, Rockwell	M/R	D785	80/120	109/126	100/120
IZOD Notched impact	fi-lb/in	D256	3.5	1	1
Continuous 5,000/20,000 hr Short Period 4 hr	°F/ °C	-	-	392/200	590/310
THERMAL PROPERTIES					
Coefficient of thermal expansion	x 10^{-5} in/in/ °F	D696	7.5	3.1	2.6
Heat deflection temperature @2 64 psi	°F/ °C	D648	132/55	392/200	320/160
Melting temperature	°F/ °C	D3418	329/168	410/210	644/340
Max operating temperature	°F/ °C	-	181/83	340/171	480/249
Limiting Oxygen Index	%	D2863	-	47	-
Thermal conductivity	BTU-in/ft^2-hr-°F	C177	1.7	1.53	1.75
Flammability Rating	-	UL-94	V-0	V-0	V-0
ELECTRICAL PROPERTIES					
Dielectric strength short time, 1/8" thick	V/mil	D149	285	831	480
Dielectric constant at 1 MHz	-	D150	2.1	3.15	3.3
Dissipation Factor at 1 MHz	-	D150	<0.0002	0.0013	0.003
Volume resistivity at 50% RH	ohm-cm	D257	$>10^{16}$	$1.0x10^{17}$	$4.9x10^{16}$

NEOPRENE



Key Features:

In the dynamic realm of materials science, where innovation and functionality converge, "Neoprene". Renowned for its versatility and unique properties, Neoprene has found its way into an array of applications, from protective gear to industrial components.

Moreover, the evolution leads this material into the realm of Mold-Injected Neoprene which serves modern manufacturing and material assembling system.

Neoprene:

The advantages of Neoprene which has been known for its excellent resistance to chemicals, oils , and abrasion. Neoprene has become synonymous with durability. Its remarkable ability to maintain flexibility across a wide temperature range, coupled with robust weather resistance , has made it a stalwart choice in diverse industries, including marine applications, and automotive.

Mold-Injected Neoprene:

This innovative process marries the intrinsic strengths of Neoprene with the precision of molding techniques, resulting in a material that not only retains the original resilience of Neoprene but also offers tailored shapes and intricate detailing.

The marriage of Neoprene's inherent qualities with the precision of injection molding expands the material's applications, providing a customizable solution for industries that demand both form and function.

We also use NEOPRENE in our YU-Bolt (Category A)

Comparison between Neoprene and Natural rubber

Point	Neoprene	Natural Rubber
1. Chemical Composition	A synthetic rubber derived from polychloroprene, created through the polymerization of chloroprene.	Obtained from latex, a milky fluid harvested from types of rubber trees. It consists mainly of polymers of certain isoprene.
2. Temperature Resistance	Maintains flexibility across a wide temperature range (-40°C to 121°C or more).	Has limitations in extreme temperatures, becoming brittle in cold conditions and softening in heat.
3. Chemical Resistance	Resistant to oils, chemicals, and solvents.	Less resistant to oils and some chemicals compared to Neoprene.
4. Weather Resistance	Exhibits good resistance to ozone and UV exposure, suitable for outdoor applications.	Susceptible to Ozone and UV degradation, may require additives for improved weather resistance.
5. Durability and Abrasion Resistance	Known for durability and resistance to abrasion.	Has good tear strength but may wear faster than some synthetic rubbers with enhanced abrasion resistance.
6. Water Resistance	Highly water-resistant, commonly used in applications requiring water sealing.	Exhibits good water resistance.
7. Tensile Strength	Generally has higher tensile strength compared to natural rubber.	Known for good tensile strength but may vary depending on the specific formulation.
8. Applications	Wetsuits, drysuits, gaskets, hoses, weather seals, protective gear.	Tires, conveyor belts, footwear, gloves, seals , gaskets , various industrial and consumer goods.
9. Elasticity	Exhibits good elasticity and flexibility, maintaining its shape over a wide temperature range.	Renowned for its high elasticity and flexibility.
10. Cost	Generally more expensive than natural rubber	Can be less expensive than some synthetic alternatives.

Specification

PROPERTIES FOR : NEOPRENE		
Density after sulfuration	kg/m^3	1,600
Elongation	%	200
Tensile strength	MPa	2.5
Hardness	Shore A	65
Max Service Temp	°C	120