

POLYMICS

Concept to Solution®



Resins, Compounds, and Stock Shapes

Oil & Gas Industry Brochure

Polymics is one of the world's premier developer and manufacturer of ultra-high performance engineering polymers for an infinite variety of engineered uses.

We stand alone globally by providing the expertise and manufacturing capabilities to take customers from high performance thermoplastic material development to final part molding.

With true one-stop 'Problem to Finished Part' solutions, we use materials like PPS, PEI, PPSU, PEEK, and Celazole®PBI to make up our resins and shapes. We are leaders in technology industries like Electronic processing, Oil & Gas exploration & operation, and Industrial and Medical manufacturing that depend upon the superior service and quality provided by Polymics®, Ltd.

Premier Polymer Developer and Manufacturer

At Polymics, we are prepared to deliver whatever you need to fix your problem. We believe it is fundamental to provide a variety of tangible solutions for our customers. That is why we choose to control the process through our Vertically Integrated Supply Capability. We work closely with our customers to not only solve the problems encountered today, but we aim to maintain our ability to provide custom solutions that keep you from compromising on performance or quality.

Focused on achieving the complete solution



PEI is commonly referred to by the tradename Ultem® and PPSU is commonly referred to by the tradename Radel®. Ultem is a registered trademark of Sabic Innovative Plastics. Radel is a registered trademark of Solvay Advanced Polymers. Celazole® is registered trademarks of PBI Performance Products Inc.

Pyramid™, PEKK PLUS®, StructoMax™, EnduraMax™, SealMax™, ThermoMax™, CAM®, Arylmax P®, Arylmax K®, and Polymics® are trademarks of Polymer Instrumentation and Consulting Services, Ltd. (Polymics, Ltd.) All rights reserved.

TABLE OF CONTENT

<i>Polymics Resins & Compounds</i>	<i>1</i>
<i>Structural Grade</i>	<i>2</i>
<i>Wear Grade</i>	<i>3</i>
<i>Seal Grade</i>	<i>4</i>
<i>Polymics Stock Shapes</i>	<i>5</i>
<i>StructoMax</i>	<i>6</i>
<i>EnduraMax</i>	<i>7</i>
<i>SealMax</i>	<i>8</i>
<i>ThermoMax</i>	<i>9</i>
<i>Special Capabilities</i>	<i>10</i>
<i>Availability - Generic Products</i>	<i>11</i>
<i>Availability- Application Specific Products</i>	<i>12</i>
<i>High Performance SEALMAX Tubes Availability</i>	<i>13</i>
<i>Selection Guide</i>	<i>14</i>

Polymics Resins & Compounds

We pride ourselves on being able offer a wide range of options, holding our customization ability of our resins and compounds to the highest standard. Our deep technical knowledge and vertical production capabilities allow us to service our customers' needs with our standard product lines or by developing application specific solutions for unique customer applications. Our technological expertise allows us to look at our customer's application and work with them to develop a customized solution.

Polymics produces its line of compounds for molding and extrusion applications with a wide range of base resin combined with fillers and reinforcements to meet any application requirement.

Because we specialize in all types of structural, wear, and ESD additives we can offer custom solutions to many of our customers which will meet uncommon application specifications.

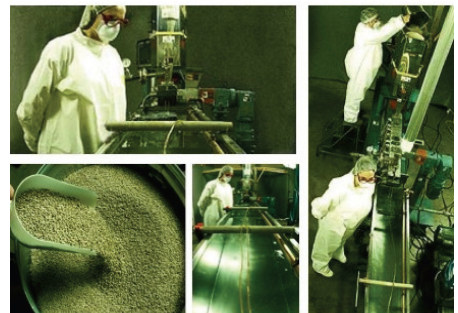
Polymics offers expertise concerning the ultra-high performance polymers:

- Polybenzimidazole (**Celazole®PBI** and Blends)
- Polyimides (Ultem® PEI, PAI, and PI)
- Polyaryleketones (PEEK, PEKK, PAEK, PEK, and Blends)
- Polyphenylene Sulfides (PPS)
- Polysulfones (PSU, PES, and PPSU)
- Arylmax® K (PEKK)
- Arylmax® P (PAEK)



The fillers and reinforcements that Polymics utilizes include:

- Glass powders, fibers, spheres, and beads.
- Carbon powders, fibers, and nano-fibrils.
- Lubricants including PTFE, Silcones, MoS2, and graphite.
- Conductive fillers including carbon, stainless steel, and Inherently Dissipative Polymers (IDPs).



Alongside the expansion of our family of polymer products, our lab is also prepared to formulate a custom solution polymer for whatever application you need. Feel free to contact us for more information (www.polymics.com).

Structural Grade

Structural compounds from Polymics are economical to produce and often lead to overall systems cost reductions by eliminating the need for secondary operations. Because of their excellent mechanical properties, Polymics' compounds also serve as great replacements to existing ceramics and metal applications. Our structural grade applicators can withstand aggressive environments and can be used in wear systems with little or no lubrication.

Such replacements can be seen in gears, seals, supporting rings, and even support beams. High performance polymers are an attractive alternative because of weight reduction, lower fuel consumption, fewer emissions, and inherent damping found in plastics, and their ability to be recycled. Additionally, plastics offer a greater range of manufacturing options which allow complex geometries to be created in less time with less waste.

Material Grades	General Composition	Tensile Strength	
Pyramid® KD2150	Glass Fiber PEEK Compound	18000 psi	120 MPa
Pyramid® KD2250	Carbon Fiber PEEK Compound	32000 psi	220 MPa
Pyramid® KC2150	Glass Fiber PEKK Compound	24650 psi	170 MPa
Pyramid® KC2250	Carbon Fiber PEKK Compound	34800 psi	240 MPa
Celazole® TF-60V	Glass Reinforced PBI/PEEK	19000 psi	130 MPa
Celazole® TF-60C	Carbon Reinforced PBI/PEEK	27000 psi	185 MPa
Celazole® TU-60	Unfilled PBI/PEEK	13000 psi	90 MPa

The previous table showcases the structural grades we offer and some of their mechanical characteristics, for more product or sales information, please contact us.

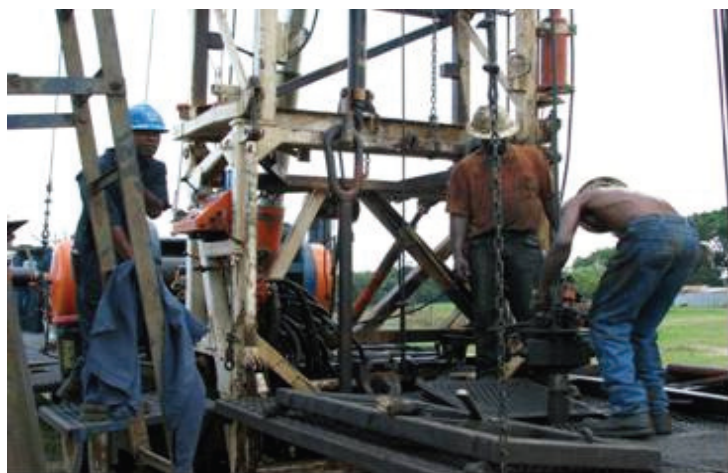


Wear Grade

Polymics offers a family of compounds with excellent wear performance. Traditionally, wear applications required lubricated metals, but advancements in polymer customization have brought about high performing light-weight plastics with long life-cycles, and low failure rates in aggressive environments. These wear grade plastics offer a range of wear-resistant plastic materials, which contain internal lubricants which reduce or eliminate the need for additional fluid lubricants. Using our wear grade plastics generate less friction and heat, yielding increased part life and reduction in maintenance costs.

Material Grades	General Composition	PV Value	Service T, °C
Pyramid® SE2219	Wear Grade PPS	25,000	150
Pyramid® KD2219	Wear Grade PEKK	30,000	220
Pyramid® KC2219	Wear Grade PEKK	40,000	230
Celazole® TL-60	Wear Grade PBI/PEEK	>150,000	260

The previous table showcases the wear grades we offer and some of their mechanical characteristics, for more product or sales information, please contact us.



Seal Grade

Our seal grade family of materials exhibits good performance and mechanical properties for seal applications.

These materials make great back-up rings, seal seats, bushings, and o-rings providing high strength and superior chemical resistance. In down-hole environments, these materials perform at continuous high service temperatures. The properties of these compounds make them good alternatives to metal.

Material Grades	General Composition	Elongation at Break, %
Pyramid® KD2000	Unfilled PEEK	>40 %
Pyramid® KD2152	Glass Fiber PEEK Compound	3.1 %
Pyramid® KD2252	Carbon Fiber PEEK Compound	3.0 %
Pyramid® KC2000	Unfilled PEKK	>20 %
Pyramid® KC2152	Glass Fiber PEKK Compound	3.2 %
Pyramid® KC2252	Carbon Fiber PEKK Compound	3.0 %

The previous table showcases the seal grades we offer and some of their mechanical characteristics, for more product or sales information, please contact us.



Polymics Stock Shapes

Hot Compression Molded, Injection Molded, Extruded, and Centrifugally Assisted Molding (CAM®) thermoplastic stock shapes manufactured by Polymics provide engineers and machine shops with the high quality and performance materials required for the most demanding applications. Our attention to cleanliness and proprietary low stress processing methods assure our customers the defect free and dimensionally stable products that they require. Customers with demanding applications in the Semi-Conductor Processing, Oil and Gas Exploration, Industrial, and Medical industries depend on Polymics' stock shapes products.



Notably, Polymics is one of only two PBI suppliers in the world, supplying super-high temperature performance and chemical resistance.

In addition to our standard material grades, Polymics offers stock shapes in customized material grades to provide solutions to the most demanding challenges.



StructoMax

Structural stock shapes from Polymics are economical to produce and often lead to overall systems cost reductions by eliminating the need for secondary operations. Because of their excellent mechanical properties, Polymics' compounds also serve as great replacements to existing ceramic and metal applications. StructoMax™ applications can withstand aggressive environments and provide the high strength needed for structural applications.



Potential applications are gears, seals, supporting rings, and even support beams. High performance polymers are an attractive alternative because of weight reduction, lower fuel consumption, fewer emissions, and inherent damping found in plastics, and their ability to be recycled.

Material Grades	Available Forms	Tensile Strength		Service T, °C
STRUCTOMAX 010	HCM	79,800 psi	550 MPa	150
STRUCTOMAX 105	INJ, HCM	12,500 psi	86 MPa	150
STRUCTOMAX 115	INJ, HCM	26,000 psi	180 MPa	150
STRUCTOMAX 125	INJ, HCM	40,600 psi	280 MPa	150
STRUCTOMAX 170	INJ, HCM	60,000 psi	420 MPa	180
STRUCTOMAX 180	HCM	80,000 psi	552 MPa	180
STRUCTOMAX 415	INJ, HCM	18,000 psi	120 MPa	260
STRUCTOMAX 425	INJ, HCM	32,000 psi	220 MPa	260
STRUCTOMAX 450	HCM	45,000 psi	310 MPa	300
STRUCTOMAX 460	HCM	82,000 psi	565 MPa	300
STRUCTOMAX 515	INJ, HCM	24,650 psi	170 MPa	280
STRUCTOMAX 525	INJ, HCM	37,700 psi	260 MPa	280
STRUCTOMAX 550	INJ, HCM	42,000 psi	290 MPa	300
STRUCTOMAX 560	HCM	58,000 psi	400 MPa	310
STRUCTOMAX 580	HCM	85,000 psi	586 MPa	310
STRUCTOMAX 810	INJ, HCM	19,000 psi	130 MPa	315
STRUCTOMAX 820	INJ, HCM	27,000 psi	185 MPa	315

*Available Forms refer to: HCM=Hot Compression Molded, INJ=Injection Molded. The previous table showcases the structural grades we offer and some of their mechanical characteristics. For more product or sales information, please contact us at sales@polymics.com.

EnduraMax

Polymics offers stock shapes in several materials with excellent wear performance. Traditionally, wear applications required lubricated metals, but advancements in polymer customization have brought about high performing light weight plastics with long life-cycles, and low failure rates in aggressive environments. The EnduroMax™ product line of plastics offer a wide range of wear-resistant plastic materials, many of which contain internal lubricants or lubricating properties. These lubricants reduce or eliminate the need for additional fluid lubricants. Parts from these materials generate less friction and heat, yielding an increased part life and reduction in maintenance costs.



Material Grade	Available Forms	PV Value, [ft.lbs.ft/in. ² min.]	Service T, °C
ENDURAMAX 110	INJ, HCM	10,000	150
ENDURAMAX 120	INJ, HCM	15,000	150
ENDURAMAX 400	INJ, HCM	10,000	200
ENDURAMAX 410	INJ, HCM	15,000	200
ENDURAMAX 420	INJ, HCM	20,000	250
ENDURAMAX 460	INJ, HCM	30,000	250
ENDURAMAX 510	INJ, HCM	20,000	220
ENDURAMAX 520	INJ, HCM	25,000	260
ENDURAMAX 560	INJ, HCM	35,000	260
ENDURAMAX 700	HCM	60,000	280
ENDURAMAX 710	HCM	80,000	280
ENDURAMAX 800	INJ, HCM	30,000	280
ENDURAMAX 820	HCM	200,000	320
ENDURAMAX 880	HCM	50,000	380

*Available Forms refer to: HCM=Hot Compression Molded, INJ=Injection Molded

The previous table showcases the material grades we offer for wear applications. For more product or sales information, please contact us at sales@polymics.com.

SealMax

Our SealMax™ stock shape product line of materials offers a wide range of engineered plastic products exhibiting good performance and mechanical properties for seal applications.

The SealMax™ product line forms the foundation for seal seats, bushings, and o-rings providing high wear and superior chemical resistance. In down-hole environments these materials perform at continuous high service temperatures, with less weight and less audible noise. The self-lubricating properties of these resins and shapes make them good alternatives to metal.



Material Grades	Available Forms	Elongation to break, %	Service T, °C
SEALMAX 400	INJ, HCM, CAM	40 %	200
SEALMAX 410	INJ, HCM	3.1 %	250
SEALMAX 420	INJ, HCM	3.0 %	250
SEALMAX 450	INJ, HCM	15 %	200
SEALMAX 480	INJ, HCM	80 %	200
SEALMAX 510	INJ, HCM	3.5 %	260
SEALMAX 520	INJ, HCM	2.5 %	260
SEALMAX 650	INJ, HCM	15 %	280
SEALMAX 700	INJ, HCM	5.0 %	280
SEALMAX 820	INJ, HCM	2.0 %	280
SEALMAX 850	HCM	3.0 %	300
SEALMAX 870	HCM	2.0 %	320

*Available Forms refer to: CAM=Centrifugal Assisted Manufactured, HCM=Hot Compression Molded, , INJ=Injection Molded

The previous table showcases the material grades we offer for seal applications and their associated elongation. For more product or sales information, please contact us at sales@polymics.com.

ThermoMax

We offer a wide range of materials suitable for high temperature applications. In our terms, this applies to environments in which the sustained operating temperature exceeds 180°C. These high performance polymers can be used in the Oil and Gas industry, Electronics industry, Medical industry, Industrial industry, and others. Uses include components for high performance applications such as down-hole components, valve seats, and other components in high temperature environments.



The great distinguishing factor to the ThermoMax™ polymer family is its ability to outperform PEEK at higher temperatures. Glass transition temperatures reach 175 °C, and due to their semi-crystalline nature these polymers provide excellent chemical resistance and maintain high performance at elevated temperatures.

Material Grades	Available Forms	Glass Transition T, °C	Service T, °C
THERMOMAX 100	INJ, HCM	95	150
THERMOMAX 200	INJ, HCM	217	200
THERMOMAX 300	INJ, HCM	220	210
THERMOMAX 400	INJ, HCM	145	220
THERMOMAX 500	INJ, HCM	170	230
THERMOMAX 600	INJ, HCM	240	250
THERMOMAX 700	HCM	280	300
THERMOMAX 810	INJ, HCM	150	300
THERMOMAX 850	HCM	410	380

*Available Forms refer to: CAM=Centrifugal Assisted Manufactured, HCM=Hot Compression Molded, INJ=Injection Molded

The previous table showcases the material grades we offer for high pressure and high temperature applications. For more product or sales information, please contact us at sales@polymics.com.

Special Capabilities

Polymics has the ability to design solutions to more complex or critical parts using special resins and manufacturing techniques.

Arylmax K® is a new polymer family with the great distinguishing factor of outperforming PEEK at higher temperatures. This resin serves as a great material selection for high performance applications such as down-hole components, valve seats, and other components in high temperature environments. Special benefits of Arylmax K include:

- Glass transition temperature (T_g) of 165 to 175 °C
- Excellent chemical resistance
- Semi-Crystalline thermoplastic copolymer family
- Electrophilic displacement reaction @ low temp (-20 to 25 °C)
- Melting temperature (T_m) of 305 to 370 °C (Higher temperature Thresh-hold than PEEK)
- Excellent performance in aggressive environments (high temperature, high pressure)



Arylmax P® is in developmental stages, but will be intended for use in the Oil and Gas industry, Electronics industry, Medical industry, Industrial industry, and others. The intent behind developing Arylmax P is to create a polymer family of PAEK to perform at temperatures even higher those of Arylmax K. This would enable customers to reduce the amount of coolants and protective design measures in applications, which in turn will reduce costs and increase production. Special benefits of Arylmax P include:

- Glass Transition temperature (T_g) of 195 – 245 °C (higher than PEEK)
- Semi-crystalline thermoplastic copolymer family
- Nucleophilic displacement reaction @ high temp (260 – 320 °C)
- Melting temperature (T_m) of 320 to 370 °C
- Being developed to exceed the application scope of Arylmax K



CAM™, or Centrifugally Assisted Molding, is a premier method of manufacturing that combines the best aspects of injection molding and hot compression molding. By using high speed turn tables, CAM tubes can be manufactured to longer lengths and thinner wall thicknesses than formally possible by standard molding or extrusion processes. Overall, there is minimal scrap material and shorter run times. Despite the faster production, the mechanical properties of the PEEK tubes are better than compression molding & extrusion, while offer lower residual stress than injection molded parts.

Injection Molding plastic parts and components benefits both the cost and engineering perspective of a project. Traditionally, when complex geometries are involved lengthy machining must take place in order to produce the finished product. Injection Molding enables high volume high quality production by allowing grooves, hooks, etc. to be placed into the component during the molding process. This saves time, money, and material. Polymics is proud to offer a range of polymer resins and compounds with the capability of being injection molded.

Availability – Generic Products

Polymics resins and compounds are offered in standard 25 Kg bags or larger gaload boxes. They can be purchased in the form of flakes, pellets, and various fine sizes powders for specific processing and application requirement.

Most Polymics resins, including specialty compounds, are offered for sales without restriction. Process guides for specific resins and compounds are available upon request.

Polymics special molded shapes and parts are offered in standard and custom dimensions or designs for specific application and end use requirements.

Generic semi-finished goods and parts of most Polymics resins and compounds are offered by injection molding, compression molding, and unique CAM® processes whenever available. Selected extruded rods, sheets, and films may also be available to support end use requirements.

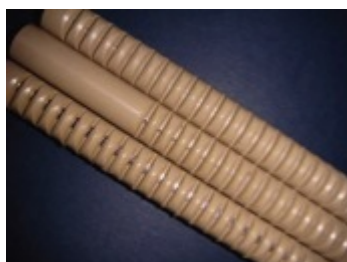
Resin & Compound	Rod	Plate	Tube
Arylmax® K	.250"-6"	A, B, C .250"-2" thick	3"-16.50" OD 1"-14" ID
Pyramid® KD	.250"-6"	A, B, C .250"-2" thick	3"-16.50" OD 1"-14" ID
Pyramid® SE	.250"-6"	A, B, C .250"-2" thick	3"-16.50" OD 1"-14" ID
Pyramid® II	.250"-6"	A, B, C .250"-2.5" thick	3"-16.50" OD 1"-14" ID
Pyramid® PI	.250"-3"	A, B, C .250"-1.5" thick	3"-16.50" OD 1"-14" ID
Celazole® U	.250"-5"	A, B, C .250"-1.5" thick	3"-16.50" OD 1"-14" ID
Celazole® T	.250"-5"	A, B, C .250"-2" thick	3"-16.50" OD 1"-14" ID



Availability – Application Specific Products

Semi-finished goods of application specific grades such as, StructoMax, EnduraMax, SealMax, and ThermoMax, are available in a wide variety of standard sizes. Availability of these forms in rods, plates, and tubes are listed in the following table. Contact our sales (sales@polymics.com) for custom dimensions, near net shapes, and other polymer and composite component requirements.

	Product	Rod	Plate	Tube	
HCM	EMDURAMAX 100	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 120	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 400	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 410	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 420	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 460	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 520	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 700	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 800	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	ENDURAMAX 880	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	SEALMAX 400	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	SEALMAX 410	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	SEALMAX 420	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	SEALMAX 450	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STATIMAX 480	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STATIMAX 510	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	SEALMAX 520	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	SEALMAX 600	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	SEALMAX 700	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STATIMAX 800	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STATIMAX 850	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STRUCTOMAX 105	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STRUCTOMAX 170	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STRUCTOMAX 180	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STRUCTOMAX 415	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STRUCTOMAX 425	.250"-3"	A, B, C .250"-2" thick	3"-16.50" OD	1"-14" ID
	STRUCTOMAX 450	.250"-3"	A, B, C .25"-2.5" thick	3"-16.50" OD	1"-14" ID
	STRUCTOMAX 460	.250"-2"	A, B, C .250"-2" thick	1 - 6" OD	1"-6" ID
	Key: A – 10" x 10" B – 12" x 12" C – 12" x 18"				



High Performance SEALMAX Tubes Availability

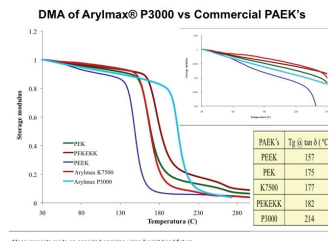
OD	Wall Thickness							
	0.25	0.375	0.5	0.625	0.75	1	1.125	1.25
1.00	0.5							
1.25	0.75	0.5						
1.50	1	0.75	0.5					
1.75	1.25	1	0.75	0.5				
2.00	1.5	1.25	1	0.75	0.5			
2.25	1.75	1.5	1.25	1	0.75			
2.50	2	1.75	1.5	1.25	1	0.5		
2.75	2.25	2	1.75	1.5	1.25	0.75	0.5	
3.00	2.5	2.25	2	1.75	1.5	1	0.75	0.5
3.25	2.75	2.5	2.25	2	1.75	1.25	1	0.75
3.50	3	2.75	2.5	2.25	2	1.5	1.25	1
3.75	3.25	3	2.75	2.5	2.25	1.75	1.5	1.25
4.00	3.5	3.25	3	2.75	2.5	2	1.75	1.5
4.25	3.75	3.5	3.25	3	2.75	2.25	2	1.75
4.50	4	3.75	3.5	3.25	3	2.5	2.25	2
4.75	4.25	4	3.75	3.5	3.25	2.75	2.5	2.25
5.00	4.5	4.25	4	3.75	3.5	3	2.75	2.5
5.25	4.75	4.5	4.25	4	3.75	3.25	3	2.75
5.50	5	4.75	4.5	4.25	4	3.5	3.25	3
5.75	5.25	5	4.75	4.5	4.25	3.75	3.5	3.25
6.00	5.5	5.25	5	4.75	4.5	4	3.75	3.5
6.25	5.75	5.5	5.25	5	4.75	4.25	4	3.75
6.50	6	5.75	5.5	5.25	5	4.5	4.25	4
6.75	6.25	6	5.75	5.5	5.25	4.75	4.5	4.25
7.00	6.5	6.25	6	5.75	5.5	5	4.75	4.5
7.25	6.75	6.5	6.25	6	5.75	5.25	5	4.75
7.50	7	6.75	6.5	6.25	6	5.5	5.25	5
7.75	7.25	7	6.75	6.5	6.25	5.75	5.5	5.25
8.00	7.5	7.25	7	6.75	6.5	6	5.75	5.5
8.25	7.75	7.5	7.25	7	6.75	6.25	6	5.75
8.50	8	7.75	7.5	7.25	7	6.5	6.25	6
8.75	8.25	8	7.75	7.5	7.25	6.75	6.5	6.25
9.00	8.5	8.25	8	7.75	7.5	7	6.75	6.5
9.25	8.75	8.5	8.25	8	7.75	7.25	7	6.75
9.50	9	8.75	8.5	8.25	8	7.5	7.25	7
9.75	9.25	9	8.75	8.5	8.25	7.75	7.5	7.25
10.00	9.5	9.25	9	8.75	8.5	8	7.75	7.5
10.25	9.75	9.5	9.25	9	8.75	8.25	8	7.75
10.50	10	9.75	9.5	9.25	9	8.5	8.25	8
10.75	10.25	10	9.75	9.5	9.25	8.75	8.5	8.25
11.00	10.5	10.25	10	9.75	9.5	9	8.75	8.5
11.25	10.75	10.5	10.25	10	9.75	9.25	9	8.75
11.50	11	10.75	10.5	10.25	10	9.5	9.25	9
11.75	11.25	11	10.75	10.5	10.25	9.75	9.5	9.25
12.00	11.5	11.25	11	10.75	10.5	10	9.75	9.5

*Selected 12" - 20" Tubes available as custom order sizes
ID dimension indicated inside the box

Selection Guide

As the potential of high performance engineering polymers evolves, components and parts made from these polymers are replacing those made from stainless steel, aluminum, ceramic, and bronze. These replacements are becoming more prevalent due to the superior properties of high performance engineering plastics such as:

- Longer part life
- Elimination of lubrication
- Reduced wear on mating parts
- Faster operation of equipment/line speeds
- Less power needed to run equipment
- Corrosion resistance and inertness

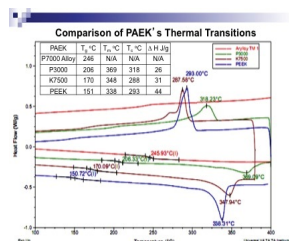


Though the advantages are obvious, selecting the best material may not be. The following outlines some guidelines that may be helpful while selecting a material.

- Step 1 – Determine what type of forces are present during operation**
 - If the forces are mainly frictional, it is a “Bearing and Wear Application”
 - If the forces are static and dynamic, it is a “Structural Application”
- Step 2 – Determine the thermal requirements of your application**
 - Consider both typical and extreme operating conditions

The two factors that determine a material’s heat resistance are its heat deflection temperature (HDT) and continuous service temperature.

- Step 3 – Determine chemical exposure**
 - Consider chemicals present in the operating environment
 - Consider chemicals or chemical processes used to clean the equipment
- Step 4 – Consider additional material characteristics including:**
 - Relative Impact Resistance/Toughness
 - Dimensional Stability
 - Regulatory/Agency Compliance



- Step 5 – Determine the best shape and manufacturing method for value**

Polymics supplies several compression molding, extrusion, CAM, and injection capabilities. Selecting the best alternative will enable the least amount of material to be used during manufacturing. This reduces fabrication costs, increases the turn-over rate, and reduces scrap material.

Only Polymics products have the high performance and material properties listed in this brochure. Make sure that your order is not only correct, but the solution you need for your application.



www.polymics.com

**CORPORATE
HEADQUARTERS**

2215 High Tech Road
State College, PA 16803
Phone: 814.357.5860
Fax: 814.357.5863
Email: info@polymics.com

SALES OFFICE

10801 Hammerly Suite 116
Houston, TX 77043
Phone: 713.568.3170
Email: sales@polymics.com

ASIA PACIFIC

#1006, Guangfu Road
Bade City, Taoyuan, 33455
Taiwan, R.O.C
Phone: 886.3.367.1357
Fax: 886.3.377.1908
Email: IFIINIinfo_apm@polymics.com

WUXI OPERATIONS

West Jin Xin Road
Xiba Industrial Park
Xishan District, WuXi City
Jiangsu Province
China 214192

DISTRIBUTOR

