



Food Processing & Packaging

FDA Compliant Plastics for:

Food Processing and Packaging, Chemical Processing, Pharmaceutical, and Dairy



Engineering Plastic Temperature Performance Groups

Values based on Heat Deflection Temperature at 264 psi load*

< 175°F	175°F - 250°F	250°F - 325°F	> 325°F
See Pages 5-7	See Pages 8-11	See Pages 12-13	See Page 14
Proteus® PP	Acetron® GP POM-C	Techtron® PPS	Sultron™ PSU
Sanalite® HDPE	Acetron® POM-H	Techtron® HPV PPS	Duratron® U1000 PEI
TIVAR® UHMW-PE	Ertalyte® PET-P	Ketron® 1000 PEEK	Sultron™ PPSU
TIVAR® H.O.T. UHMW-PE	Ertalyte® TX PET-P		
	Nylatron® MC907 PA6		
	Nylatron® LFG PA6		
	Nylatron® Nylon 101 PA66		
	Fluorosint® HPV PTFE		
	Fluorosint® 207 PTFE		



Tech Tip:

Heat Deflection vs. Continuous Use Temperature Ratings:

Mitsubishi Chemical Advanced Materials considers Heat Deflection Temperature @ 264 psi (ASTM D648) as typically the best way to compare materials for applications under load. Some supplier data unfortunately reflects only Continuous Use Temperature. This can be very close to the melting point. It is mainly meant to indicate loss of toughness from temperature exposure over time for electrical enclosures. Our data tables (pages 15-18) show both.

Mitsubishi Chemical Advanced Materials stocks a broad range of materials for applications where high temperature is not a factor and where more traditional materials provide the strength in the system. These materials (PP, HDPE and UHMW-PE) are particularly well suited for chute and slide applications, as well as bumpers, supported parts in conveyors and packaging lines. This group also is frequently used as a durable cutting surface in commercial applications.

Proteus® Polypropylene

Manufacturers can rely on the family of Proteus® PP materials to perform in a variety of applications. Its excellent chemical resistance makes it well suited for tanks and corrosion resistant liners where harsh chemicals cause problems in applications below 180°F. Ease of fabrication—vacuum forming, fabricating and welding—make Proteus® PP a solid performer in many food related applications.

Proteus® Homopolymer PP (Natural)

This is the most widely used grade. It has a high strength-to-weight ratio, excellent chemical resistance and performs well in corrosive environments, and is easily thermoformed.

Product Profile

- Performs to 180°F (82°C)
- Resists most acids, alkalis and solvents
- FDA, 3A Dairy and USDA compliant for use in federally inspected meat and poultry facilities
- Vacuum formable
- Easy fabrication and weldable

Proteus® Premium Gloss (White)

This premium grade, based on homopolymer PP adds a high gloss finish suitable for aesthetic applications.

Product Profile

- High gloss finish
- Other colors available
- FDA compliant
- Easy fabrication and weldable

Proteus® Co-polymer PP (White)

Co-polymer Proteus® is modified to improve cold impact strength and toughness characteristics.

Product Profile

- Performs to 170°F (77°C)
- Higher impact strength
- Cold weather impact strength to -34°F (-37°C)
- More pliable than homopolymer PP
- FDA compliant
- 3A Dairy compliant
- Easy fabrication and weldable

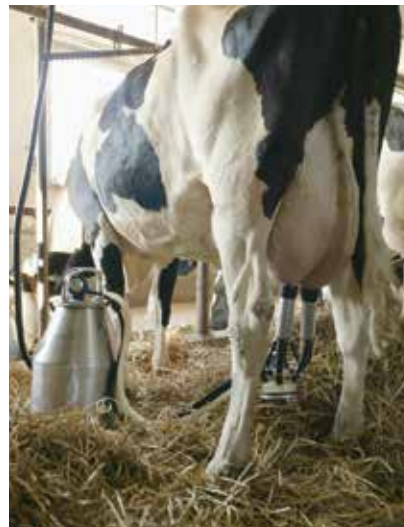
Case Study: Dairy System Coupling

Problem: A Dairy equipment manufacturer was looking for a coupling that was easy to machine, 3A Dairy compliant, and forgiving during the alignment process.

Solution: A part machined from Proteus® homopolymer PP met their design criteria.

Benefits:

- Proteus® PP is lighter than the metal part it replaced, making it easier to handle.
- Harsh cleaning chemicals are no problem for Proteus® PP.
- Proteus® PP resists absorbing odors and flavors from the food products passing through.



Proteus® High Density Polyethylene – HDPE

(White)

HDPE is a widely used basic engineering plastic material with a variety of applications. It meets FDA 21CFR Section 177.1520 and is known for good impact performance under 180°F. It is well suited for tanks, corrosion-resistant wall protection and machined parts in many food industry components. HDPE can be extruded or pressed into sheets up to 4" thick.

Product Profile

- Vacuum formable
- Excellent chemical resistance
- Good impact resistance
- High strength
- Non-toxic, non-staining
- FDA compliant

Sanalite® HDPE Cutting Board (White, Black)

This is the most widely used grade. It has a high strength-to-weight ratio, excellent chemical resistance and performs well in corrosive environments.

Product Profile

- Odorless and taste-free
- Pebbled, acid-resistant surface
- Easily cleaned
- Lightweight
- FDA, USDA, NSF and Canada AG compliant
- Consider polypropylene if a harder surface is required

TIVAR® Ultra-High Molecular Weight Polyethylene – UHMW-PE

(White)

Food processing and packaging equipment designers have learned that TIVAR® UHMW-PE materials can improve the efficiency and performance of handling systems. TIVAR® can help eliminate problems like noise, wear of mating parts and stretched chains that can cause costly downtime. With broad temperature performance, TIVAR® materials are ideal for freezing lines and operations that are intermittently exposed to temperatures up to 200°F.

Case Study: Commercial Cutting Board

Problem: Many commercial kitchens and food processing facilities have struggled with wood cutting boards that absorb liquids, flavors and odors. In addition, many of these grow into bacteria that can contaminate food products.

Solution: Sanalite® HDPE or PP cutting boards eliminate these problems.

Benefits:

- Easy to clean and disinfect—and will not absorb liquid, flavor or odor.
- Sanalite® is lighter than wood which means easier installation.
- Cut resistant polymer provides a longer service life.



Tech Tip:

TIVAR® products maintain many of their impact and tensile properties at cryogenic temperatures, making them ideal for flash or quick freeze applications.

TIVAR® 1000 (White)

TIVAR® 1000 UHMW is a widely recognized engineering material with a remarkable combination of lubricity, chemical resistance and impact strength. It also has no moisture absorption and retains most of its key properties to -22°F (-30°C). A broad range of shapes including sheet, rod, tube and profiles are possible.

Product Profile

- Reduces noise and vibration
- Slippery, wear-resistant surface
- Very low moisture absorption
- Excellent chemical resistance
- FDA, USDA and 3A Dairy compliant



TIVAR® Oil Filled (Dark Brown, Grey)

An FDA compliant lubricant is added to TIVAR® UHMW to enhance its already good bearing performance.

Product Profile

- Higher PV rating
- FDA and USDA compliant



TIVAR® CleanStat® (Black)

TIVAR® CleanStat® provides UHMW performance with the added benefit of static reduction. This helps to manage fines that are generated during manufacturing, processing and packaging operations. Ideal in drums, hoppers, chutes, buckets or any environment where particles are generated and can cause a loss of efficiency.

Product Profile

- Long-wearing surface with a lower coefficient of friction than steel or aluminum
- Helps to reduce cleaning time
- FDA, USDA and 3A Dairy compliant

TIVAR® H.O.T. (White)

Newly developed TIVAR® H.O.T. pushes the performance envelope of UHMW. It offers enhanced chemical and thermal performance in supported applications. With elevated temperature wear life up to 10x longer when compared to standard UHMW, TIVAR® H.O.T. is a new choice for wear strips, rollers and drag flights for the food processing and packaging industry.

Product Profile

- Lasts up to 10x longer in elevated temperature environments
- Resists abrasion, corrosion, chemicals and moisture
- Excellent release characteristics
- FDA, USDA and 3A Dairy compliant
- Excels in a variety of industrial manufacturing environments where temperatures range up to 275° F

Case Study: Candy Mixing Paddle

Problem: Aggressive cleaning chemicals and elevated temperatures caused failures and costly, frequent replacement of metal and PE mixing paddles. Downtime associated with part replacement increased the plant's production costs.

Solution: TIVAR® H.O.T. enhanced UHMW-PE solved the discoloration, galling and wear problems associated with the prior materials.

Benefits:

- TIVAR® H.O.T paddles last 6x longer than prior materials.
- Discoloration from the elevated temperatures has been completely eliminated.
- The enhanced UHMW-PE material is more resistant to harsh cleaning chemicals than stainless steel.



Mitsubishi Chemical Advanced Materials materials for this temperature range differ in bearing and wear, temperature and chemical resistance. All are more stable than UHMW in temperature swings, to minimize dimensional change in mating parts. Compare them for the best balance of cost and performance.

For non-food contact applications requiring extreme bearing and wear or structural loads see page 23.

Acetron® GP POM-C

(White, Black) 

- Improved dimensional stability vs. nylon—lower moisture absorption
- Porosity-free rod and plate—minimizes bacteria build-up, easier to sanitize
- Low, consistent internal stress minimizes dimensional change in machining and use
- Uses: general bearing and wear and mixing components
- Compliance: FDA, USDA, NSF, 3A Dairy, Canada AG

Acetron® MD POM-C

(Medium Blue) 

- Formulated for use with existing metal detection units
- Good bearing performance in wet and dry environments
- Food contact safe: FDA and EU 10/2011 compliant

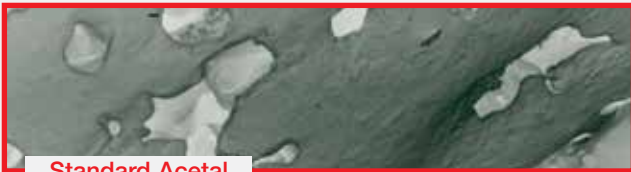
Acetron® Food Grade Blue 50 POM-C

(Medium Blue) 

- Blue in color for visual detection, increased food product safety, and proactive contamination prevention.
- FDA and EU Food Grade Compliant
- High dimensional stability and wear-resistance.

Acetron® POM-H — homopolymer acetal

- Slightly higher strength than co-polymer acetal
- Uses: General, Structural and Bearing Applications (Porosity may cause sanitation issues)
- Compliance: FDA, NSF, 3A Dairy



Standard Acetal

Some acetals—even copolymer or claimed porosity-free material—can contain tiny holes that trap dirt and bacteria. (photo-micrograph @ 500x)



Acetron® GP POM-C

Only Acetron® GP POM-C combines the assurance of porosity-free performance with the ease of machining that the industry's lowest stress levels provide. (photo-micrograph @ 500x)

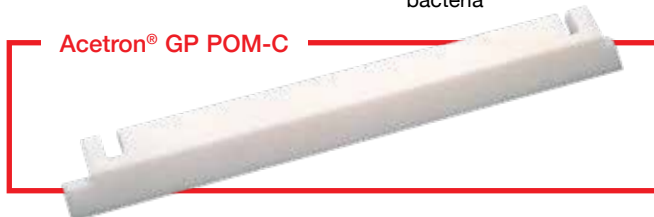
Case Study: Commercial ice cream equipment

Problem: Scraper blades in stainless steel were costly and wore mating parts quickly.

Solution: Replacement blades machined from Acetron® GP POM-C plate.

Benefits:

- Lower part cost, minimal wear and repair cost on mating surfaces
- Stiffness and low stress ensure flatness for mixing efficiency
- Porosity-free quality minimizes potential for trapped food and bacteria



Acetron® GP POM-C



Ertalyte® PET-P

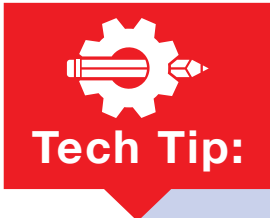
(White, Black) 

- Combines acetal's dimensional stability, nylon's strength—plus better wear resistance
- Higher temperature resistance of 240°F under load allows hotter cleaning solutions
- Resists staining, outperforms nylon, acetal in acidic environments
- Uses: precision parts needing dimensional stability at elevated temperatures
- Compliance: FDA, USDA, 3A Dairy, Canada AG
- Withstands “bleach solutions” unlike Nylon/Acetal

Ertalyte® TX PET-P

(Light Grey) 









- Far less wear than standard PET, PBT and lubricated acetals—best in class
- Excels in high velocity load-bearing applications—wet or dry
- Minimizes wear against soft metal and plastic mating parts
- Uses: Upgrade to longer life precision parts—reduce downtime and lubrication
- Compliance: FDA, USDA, 3A Dairy



Ertalyte® PET has machining characteristics different from those of nylon and acetal. Request our machining guidelines for easy adaptations to assure high quality machined parts.

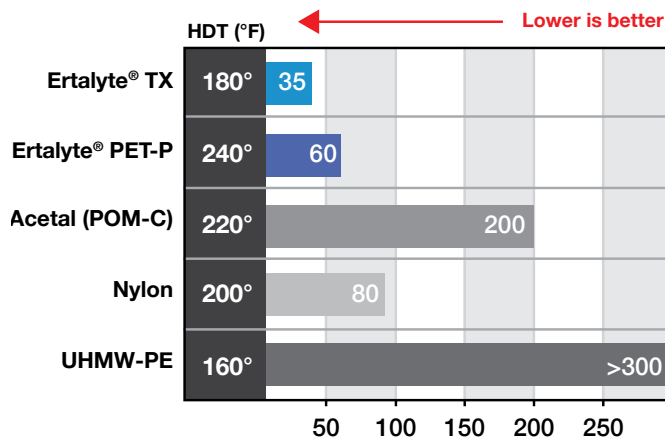
All polyesters including Ertalyte® are less resistant to hot water and steam than acetal. Contact Mitsubishi Chemical Advanced Materials' technical support team to review specific applications.

Dimensional Stability

Ertalyte®	Acetal	Nylon	UHMW-PE
Water Absorption (24 HR.)			
 0.07	 0.20	 0.30	 <0.01
Coefficient of Linear Thermal Expansion (CLTE)			
 3.3×10^{-5}	 5.4×10^{-5}	 5.5×10^{-5}	 9×10^{-5}



Wear Factor



Case Study: Dairy food liquid filling equipment

Problem: High cost, wear rate of stainless steel.

Solution: Pistons and valves machined from Ertalyte® PET-P rod.

Benefits:

- Tight tolerances assure fill accuracy and efficiency— with a lower cost part
- Lower weight allowed lighter duty, lower cost drives— which outlasted former units
- Resistance to various liquids and chemicals afforded more production versatility

Nylatron® MC 907 PA6 (Creamy White)

- Highest strength and hardness in cast nylon type 6
- Better dimensional stability and strength than UHMW
- Uses: general utility parts
- Compliance: FDA, USDA, 3A Dairy

Enhanced Wear Resistant Nylatron® LFG PA6 (Creamy White)

- Lower coefficient of friction and higher PV
- Improves bearing and wear performance over standard grades
- Uses: alternative to standard cast nylon where external lubrication is impractical
- Compliance: FDA

Nylatron® Nylon 101 PA66 (Creamy White, Black)

- Highest strength and rigidity of all nylon products
- Uses: screw-machined electrical insulators and food contact parts
- Sizes: range includes small diameter rod, thin plate
- Compliance: FDA, USDA, 3A Dairy, NSF



Case Study: Candy manufacturing equipment

Problem: Metal rollers wore out too quickly and held heat during production.

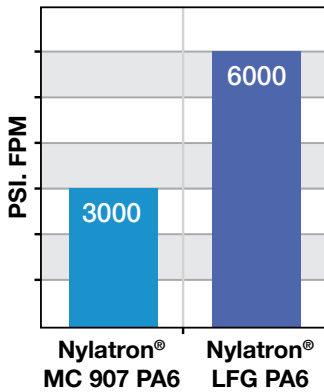
Solution: Parts were replaced with machined Nylatron® Nylon 101 PA66.

Benefits:

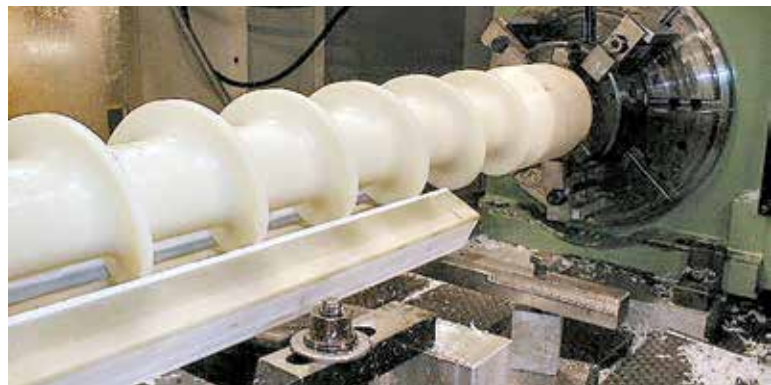
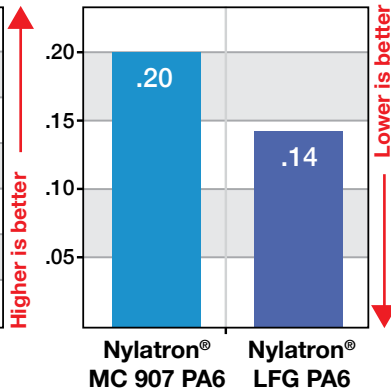
- Far longer wear life and time between maintenance cycles
- Reduced downtime for system lubrication and parts replacement



Limiting PV



Coefficient of Friction (Dynamic)



Consider the versatility and cost saving potential of Nylatron® Custom Castings:

The nylon casting process allows a range of formulations and sizes including large heavy walled tube, large diameter rod, thick plates and blocks. It also allows casting custom parts and near net shapes that can cut cost vs. machining from a stock shape. This large part is FDA compliant Nylon cast over a steel shaft.

Fluorosint® HPV PTFE (Light Tan)

- Most wear resistant of all Fluorosint® grades
- Able to withstand higher PV loads than most PTFE based materials
- Resistant to steam and moisture
- Compliance: FDA 21 CFR 175.300
- Ideal for seals and bearings in high load applications

Fluorosint® 207 PTFE (White/Grey)

- Excellent dimensional stability among PTFE's; non-permeable in steam
- Wear life at < 300°F (150°C) 20 times greater than typical filled PTFE
- Nearly 10 times more resistant to deformation under load than PTFE
- Uses: Aggressive service, tight tolerance bearings and bushings
- Compliance: FDA 21 CFR 175.300, USDA
- Ideal for seals and gaskets up to 500°F, where standard PTFE loses stability

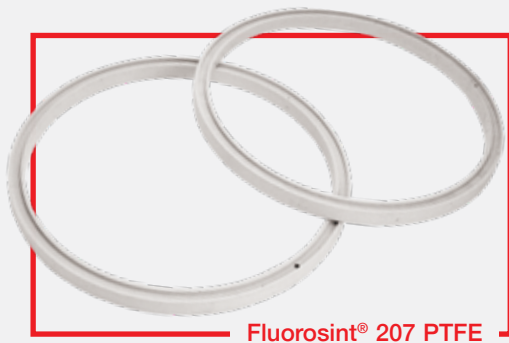
Case Study: Bearings in commercial frying equipment

Problem: Premature part wear at high temperature; contamination from lubrication of metal.

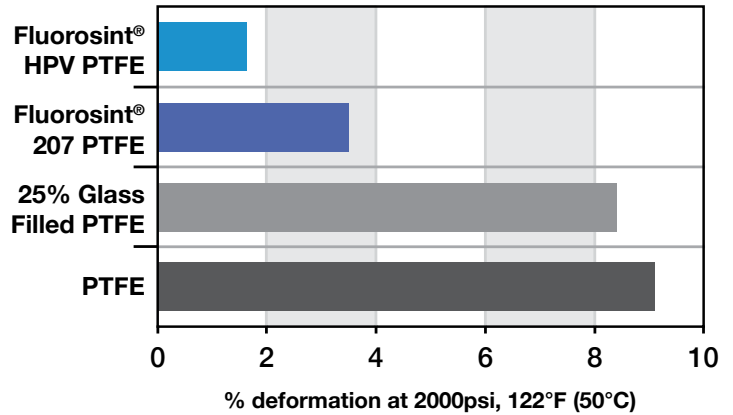
Solution: Composite design—bearing surfaces made from Fluorosint® 207 PTFE supported by metal.

Benefits:

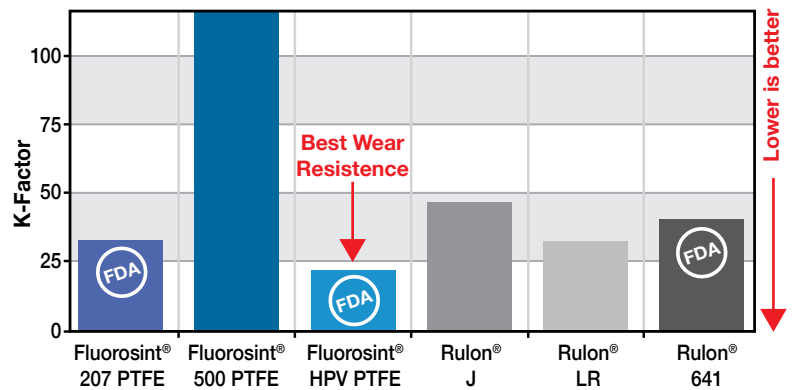
- Fluorosint® 207 PTFE eliminates high wear from dynamic load
- Metal adds structural strength and avoids wear exposure
- Avoids deformation and degradation



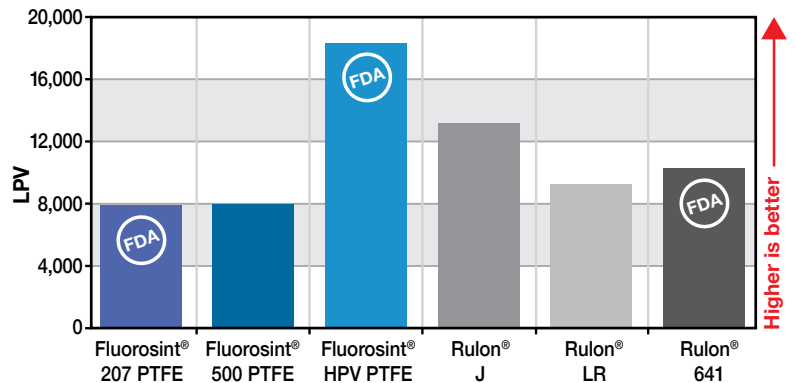
Deformation Under Load



Relative Wear Resistance



Limiting PV



Mitsubishi Chemical Advanced Materials has an ongoing development effort in materials for this application range as cleaning methods get hotter and more aggressive. These advanced materials deliver unique levels of wear and chemical resistance, dimensional stability and strength retention. Their diversity provides options for the best balance of cost and performance, without expensive over-engineering.

For non-food contact applications requiring extreme bearing and wear or structural loads see page 23.

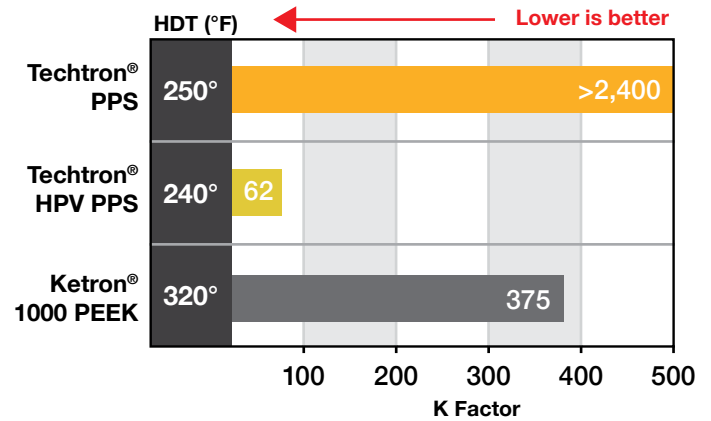
Techtron® PPS (Grey/Beige)

- Unsurpassed chemical resistance in this range
- Unique Mitsubishi Chemical Advanced Materials technology—toughest, most durable unfilled PPS available
- Takes structural load to 240°F—in steam, hot water and cleaning chemicals
- Uses: structural mixing and handling components that see high temperatures in cleaning and use
- Compliance: FDA

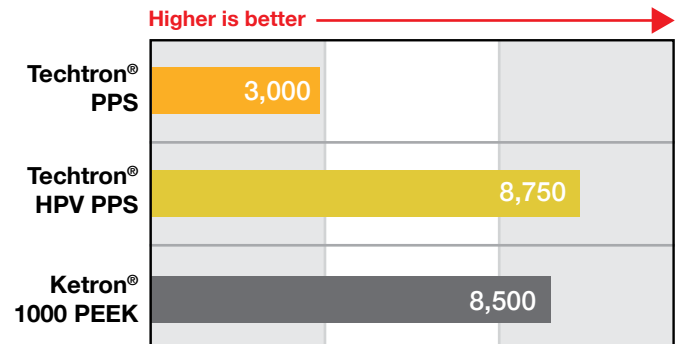
Techtron® HPV PPS (Medium Blue)

- Unique combination of ultra-low wear, extreme chemical resistance in the 200°-240°F range
- No abrasive glass fibers common to filled PPS—minimizes counter-face wear
- Similar electrical, chemical and hydrolysis resistance of natural Techtron® PPS
- Uses: cost-effective high performance alternative to PEEK below 250°F
- Compliance: FDA (in applications up to 160°F)

Relative Wear Resistance



Practical Limiting PV



Case Study: Guide rail—commercial meat portioning and packaging equipment

Problem: Traditional plastic materials failed as wash-down temperatures increased.

Solution: Replace existing material with FDA compliant Techtron® PPS.

Benefits:

- Faster line turn-around using hotter cleaning methods
- Eliminated part damage and hard to clean gaps from dimensional changes



Ketron® 1000 PEEK

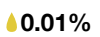

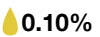

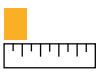

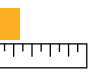

(Light Beige) 

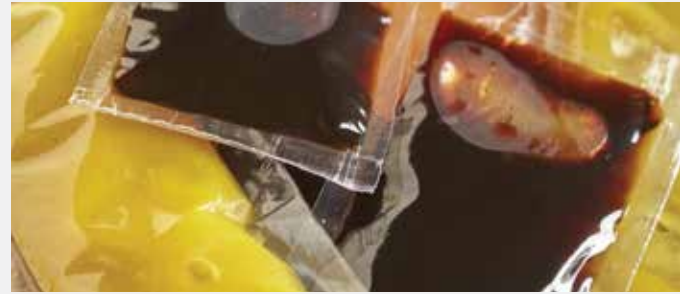
- Ideal for food contact bearing and wear applications from 240° - 325°F
- Resists wide range of aggressive, hot chemicals and cleaning solutions
- Uses: Oven and hot process parts; exposure to steam, chemicals under pressure
- Compliance: FDA, USDA, 3A Dairy

Ketron® 1000 PEEK offers an excellent combination of physical properties:

	Ketron® 1000 PEEK	Techtron® PPS	Techtron® HPV PPS
Overall Chemical Resistance	Very Good	Excellent	Excellent
Moisture Absorption	Very Good	Excellent	Excellent
Steam Resistance	Good	Good	Good
Wear Resistance (dry)	Very Good	Poor	Excellent
Continuous Service Temperature	480°F (250°C)	425°F (220°C)	430°F (221°C)
Heat Deflection Temperature	320°F (160°C)	250°F (120°C)	240°F (115°C)
% Flexural Strength at: 300°F (150°C) at: 500°F (260°C)	84%	23%	25%
	10%	5%	25%

Dimensional Stability

Techtron® PPS	Techtron® HPV PPS	Ketron® 1000 PEEK	Acetal POM-C
Water Absorption (24 HR.)			
 0.01%	 0.01%	 0.10%	 0.20%
Coefficient of Linear Thermal Expansion (CLTE)			
 2.8×10^{-5}	 3.3×10^{-5}	 2.6×10^{-5}	 5.4×10^{-5}



Case Study: High temperature production line

Problem: High process unit temperatures warped portioning unit components. Required a cooling unit that reduced production efficiency.

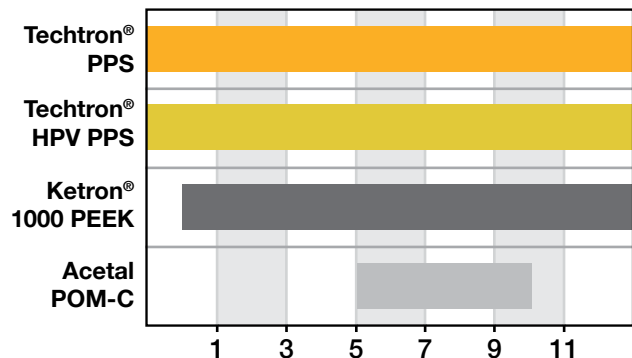
Solution: Machined components from high temperature resistant Ketron® 1000 PEEK.

Benefits:

- Eliminated distortion from high temperatures; improved production life of parts
- Eliminated cooling unit; closer placement of portioning unit increased production output and efficiency



Useful pH Range



Tech Tip:

Designing with high temperature plastics requires adjustments from typical metal designs. Refer to Mitsubishi Chemical Advanced Materials' Design and Fab Guide for clearances, bearing designs, and fit calculations. Visit us at mcam.com or call 800-366-0300.

The materials in the 300°F+ class open the weight saving and design versatility benefits of engineering plastics to applications once restricted to specialty metals and glass. Their lighter weight can mean lower-cost drive systems—and they can reduce part cost depending on the type of metal or glass replaced.

For non-food contact applications requiring extreme bearing and wear and structural loads, see page 23.



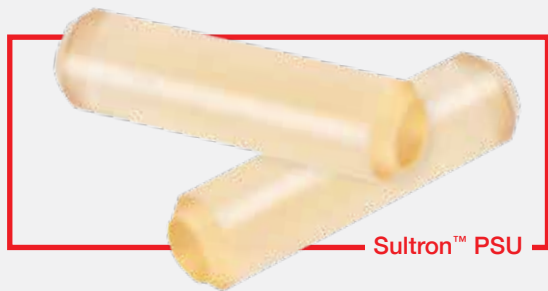
Case Study: Sight glass—hot process equipment

Problem: Glass breakage concerns; temperature failure in other transparent plastics.

Solution: Transparent Sultron™ PSU sight glass units.

Benefits:

- Durable—no breakage
- Cost effective vs. glass
- Resists hot cleaning agents and acidic solutions in processing



Sultron™ PSU

(Transparent Light Amber) 

- Structural strength to 340°F
- Withstands hot water and steam—tough, durable
- Uses: sight glass, material conveying bins
- Compliance: FDA, USDA, 3A Dairy

Duratron® U1000 PEI — polyetherimide

(Transparent Dark Amber) 

- Higher structural strength than polysulfone to 400°F
- Excellent electrical properties—rated UL V-0
- Uses: similar to polysulfone with a higher temperature limit under load
- Compliance: FDA, USDA and NSF (STD. 51)

Sultron™ PPSU

(White, Black)  

- **Best resistance to multiple sterilization cycles and chemicals in this range**
- Higher impact resistance plus strength at temperatures to 410°F
- Excellent electrical properties—rated UL V-0
- Uses: similar to polysulfone, Duratron® U1000 PEI with greater chemical and impact resistance
- Compliance: FDA



Case Study: Cookie filling distribution spool

Problem: Costly metal part required disassembly to clean. Temperatures eliminated many plastics.

Solution: One-piece spools machined from Duratron® U1000 PEI.

Benefits:

- Durable, long lasting parts withstand high temperatures near baking environment
- One piece machined part reduced cost and cleaning time vs. metal assembly



Alro Plastics, a division of Alro Steel, was started in 1987 to offer our customers quality plastic materials with outstanding customer service and next day deliveries. Alro Plastics is a full line distributor of sheet, rod, tubing, film, profiles and custom machined parts to print.

Alro Plastics is an industry leader in supplying engineering plastic shapes and parts. We cut and/or ship the same day your order is placed and provide value added processing to meet the most demanding fabrication requirements. Alro Plastics is also ISO 9001:2015 Certified, which means you can count on a quality product that is accurate and delivered on time, every time. At Alro our Mission Statement is to ensure the long term success of Alro and its people by exceeding our customers' expectations.

Give us a try and experience the Alro difference today!

Value-Added Services:

- CNC Saw cutting, multiple saws for cut-to-size orders
- Rod / Round cutting, up to 18" diameter
- Fiberglass Grating cut-to-size capabilities
- CNC Routing, machined parts to customer prints
- Plastic Welding capabilities, done in-house
- Bending, Forming, Gluing and Assembly
- Turned parts to print, screw machine & lathe work
- Polyurethane custom molded parts to print



CNC Precision Saw Cutting

At Alro Plastics we realize that simply being a plastic distributor doesn't appeal to every customer, so we need to find ways to add value to every order we process. One of the ways we can add more value is to offer our customers the ability to order cut-to-size pieces of plastics. Alro Plastics has invested in multiple CNC Precision Saws to give us the ability to cut these orders both quickly and accurately.

Our CNC Precision Saws are capable of cutting up to 8" thick material in a single pass. And with their large work surfaces, we can cut sheets up to 14 feet wide x 14 feet long.

These saws are CNC controlled and can be easily programmed to cut a single piece of material or a large production job of thousands of pieces. We also offer same day cutting and shipping on most orders for next day delivery.

Alro Plastics is also ISO 9001:2015 certified, so you can count on us to deliver a quality part cut to your specifications. We also perform in-process and final inspections to ensure the piece you ordered is the piece you will receive.



CNC Saw Cutting Capabilities:

- Thickness, from 1/16" thick up to 8" thick
- Length and width, up to 14 feet long and wide
- Standard cut tolerance is +1/16" / -0"
- Same day cutting and shipping in most cases
- In-process and final inspections



CNC Routing and Machining

Alro Plastics also offers our customers the option to order a finished part to print. Alro has invested in multiple CNC Routers that are programmable thru CAD/CAM to machine out parts based on customer supplied drawings. These machines are capable of very high speeds and are designed for production machining.

Our CNC Routers are capable of machining plastics as thick as 4" and have a work surface of 120" x 144". Our twin table router also has an automatic tool changer, capable of holding up to 16 different tools at a time. This allows us to program in complex parts and machine them using a variety of tools without stopping to change them. With the high speed of the routers and the reduced down-time from tool set-ups, Alro is capable of supplying high quality parts in a short amount of time.

CNC Routing Highlights:

- Thicknesses: 1/16" thick up to 4" thick can be machined
- Maximum part size, aprox 120" x 144"
- Standard tolerance is +/- .015", varies by material
- CAD drawing files accepted: .DWG and .DXF extensions
- General lead time is aprox 2 weeks from order date
- Quality controlled and ISO 9001:2015 Certified

5-Axis Waterjet Cutting

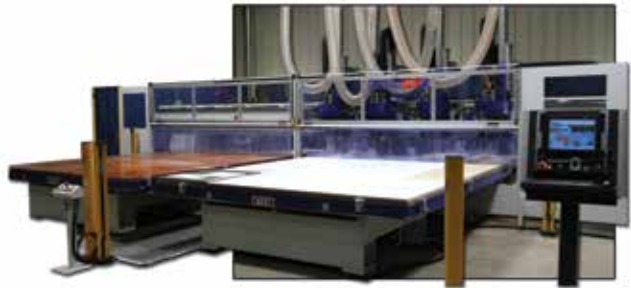
- CNC programmable machine
- 5-Axis for bevels and 3D cutting
- Able to cut sheets/slabs up to 10" thick
- Large 78" x 157" table surface
- Standard cut tolerance: +/- .015"

Plastic Welding

When most people hear the word "welding", they immediately think of steel and metal welding. Well did you know that some plastics can also be welded? Polypropylene, polyethylene, PVC, PVDF, ABS and other thermoplastics can all be welded.

Alro Plastics has invested the time and resources to become very good at plastic welding and we offer this service to all of our customers. From the simple task of butt-welding two sheets together to make one longer sheet, to the complex process of creating custom fabricated tanks to print, we can do it all.

If you have a need for something to be plastic welded, please feel free to give us a call or send us a drawing to plastics@alro.com and let us work up a quote for you.



Plastic Welding Highlights:

- Materials: Polypropylene, Polyethylene, PVC, PVDF, ABS and more
- Thicknesses from 1/8" (minimum) to 3/4" (maximum)
- Various welding methods, including hot gas and extrusion welding
- Quick turnaround times for custom fabricated jobs to print
- All done in house by Alro Plastics, reliable quality and delivery



VHMW – Very High Molecular Weight (White)



There are many cases in which UHMW is specified for installations where its ultimate abrasion and impact resistance are not necessary. In many cases, the customer's only alternative was to use standard HDPE, which lacks the durability of UHMW in most applications.

So with that in mind, Alro Plastics introduces Hy-Pact® VH (very high molecular weight polyethylene), a unique product designed to be a perfect complement to UHMW and to bridge the wide performance gap between HDPE and UHMW.

Product Profile

- Environmentally stabilized, indoor or outdoor use
- FDA and USDA approved, white opaque color
- Smooth, non-skived finish has low coefficient of friction
- Extremely flat, low-strain sheet
- Resistant to caking and bridging (build-up)
- Not affected by most aqueous acids, alkalis or salt solutions

X-Ray Detectable UHMW Polyethylene (Blue)

Repeated handling, cleaning and normal wear and tear of plastic component parts on food, beverage and pharmaceutical processing machinery increases the risk of a fragment breaking off and contaminating the product during processing. The need for traceable plastics, especially machined part for filling, sorting and packaging machinery is critical due to strict FDA regulations regarding foreign materials and contaminants.

With that in mind, Alro Plastics offers Polystone® M XDT, an X-ray detectable UHMW. Working together with one of the world's largest food processors and a leading manufacturer of X-ray inspection systems, Polystone® M XDT has proven to be detected with a particle size as small as 3mm cube. Running at speeds as fast as 250 feet-per-minute, this product can be detected and automatically sorted to a product hold area for further inspection. It works effectively with various types of packaging including metal cans, plastic and composite containers and glass jars.



Product Profile

- | | | |
|--------------------|----------------------|------------------|
| • Scraper blades | • Wear plates | • Cups & Sleeves |
| • Filler plates | • Volumetric fillers | • Piston fillers |
| • Pocket fillers | • Baffles | • Hopper Guides |
| • Mixer components | • Pillow blocks | • Dividers |



PTFE – PolyTetra-FluoroEthylene (White)

Alro Plastics offers PTFE, a very dense material having a density of 2.13 - 2.19 grams/cc. PTFE is well known for its chemical resistance. It is insoluble in all organics with the exception of a few exotics. Electrical properties are excellent. Impact strength is high but its resistance to wear, tensile strength and creep resistance are low in comparison to other engineering materials.

PTFE has an extremely low coefficient of friction. Very few materials will stick to it. It has useful properties from cryogenic temperatures

up to 260°C (550°F). PTFE is also offered in FDA compliant grades for food grade applications.

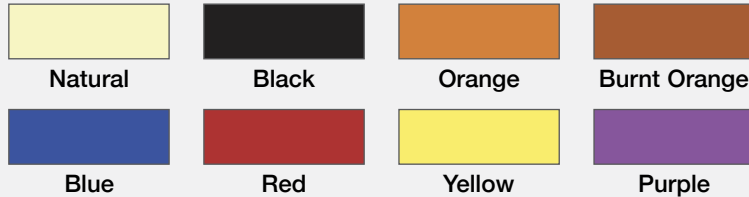
Product Profile

- Excellent electrical properties
- Great chemical resistance
- Wide range of temperatures
- FDA compliant grades available

Cast Nylon – New FDA Compliant Colors (Multiple)

Alro Plastics also offers a new array of food grade Nylon in compliant colors and formulas. This development is in response to the increasing market demand from our channel partners and end users for distinctively different colors and formulas for food grade nylon specifically targeted for the Food Processing Industries.

Each color and grade has been given a favorable opinion by the FDA for food contact situations. All colors and formulas can be provided in standard Nylon stock shapes such as, rod, tube, plate and can also be custom cast to meet customer requirements.



FDA Approved Blue Acetal Rod & Sheet (Blue)

The foremost goal in the food and beverage production & packaging industry is to deliver high quality, healthy and safe products. With that goal in mind, Alro Plastics is now stocking FDA compliant Blue Acetal in both sheet and rod stock. The FDA compliance makes it safe to use in the food and beverage industry, while the blue color makes it easier to identify should the part ever chip or break off and fall into the product being made.

Acetal provides high strength and stiffness coupled with enhanced dimensional stability and ease of machining. As a semi-crystalline material, acetal is also characterized by a low coefficient of friction and good wear properties, especially in wet environments.

Product Profile

- Low moisture absorption
- High strength, stiffness
- Easy to machine
- No centerline porosity
- FDA compliant

Tuffak® FD - FDA Compliant Polycarbonate (Clear)

Alro Plastics is an official distributor of Plaskolite and their line of Tuffak® polycarbonate sheets. Alro has access to the full line of Tuffak® products, including the FDA compliant grade, Tuffak® FD.

Tuffak® FD sheet is a non-UV stabilized transparent polycarbonate product which complies with FDA regulation 21 CFR § 177.1580 requirements for food contact. It features outstanding impact strength, superior dimensional stability, high temperature resistance, and high clarity. Ideally suited for demanding applications in food processing environments, as well as medical applications, this lightweight thermoformable sheet is also easy to fabricate and decorate.

Product Availability

- Food processing equipment and guards
- Bulk food bins
- Candy molds
- Sneeze guards
- Single use autoclave packaging
- Hospital trays



Vivak® PETG – FDA Approved PETG (Clear)

Another FDA approved product offered is Vivak® PETG from Plaskolite. Vivak® PETG sheet is a transparent co-polyester sheet product that offers a unique balance of physical properties and ease of fabrication. It is ideally suited for complex parts requiring fabrication, including deep thermoforming draws and precise molded-in details.

Vivak® sheet is produced using resin that complies with FDA regulations for food contact applications. It is easily decorated by painting, silk screening, or hot stamping. Applications include shelving, greeting card displays, revolving merchandise racks, indoor signs, point of purchase displays, menu boards, photo frames, and slat wall fixtures.

Acrylic – FDA Approved (Clear)

Alro Plastics is also a supplier of Plexiglas® and Optix® lines of acrylic sheets. Plexiglas® is the acrylic sheet produced by Arkema Inc. and Optix® is produced by Plaskolite. In its colorless form, acrylic sheet is a crystal clear, lightweight material.

Acrylic is available in many different grades, with a couple of them being approved for food contact applications. Ideal for point of purchase displays, store front marketing, sneeze and splash guards as well as menu covers.

Product Availability

- Improved shape retention in high heat
- Lightweight, less than half the weight of glass
- Up to 17 times stronger than single strength glass
- Easy to machine and fabricate, thermoformable



King MicroShield® - Antimicrobial Protection

King MicroShield® is a new kind of antimicrobial protection upgrade now available in many of King Plastic Corp's polymer sheets, slabs and massive shapes. King MicroShield® inhibits the growth of product-damaging microorganisms, including bacteria, algae and fungi on the surface. Microbe cell walls that come into contact with King MicroShield® are destroyed on contact, without creating opportunities for adaptive or resistant strains to form.

Product Eligible for Upgrade:

- **StarBoard®** - 1/4" to 1-1/2" thick
- **StarBoard® ST** - 1/4" to 1-1/2" thick
- **StarBoard® AS** - 1/2" to 1" thick
- **ColorCore®** - 1/4" to 3/4" thick
- **ColorBoard®** - 1/4" to 3/4" thick
- **KPC HDPE** - 1/16" to 1-1/2" thick



FGI-AM Fiberglass Grating

(Light Gray & Green)

Fibergrate Composite Structures has developed a unique resin system that has been successfully tested to inhibit the growth of bacteria and fungus that cause foul odors, discoloration, and mildew on the surface of the product that in some cases can degrade or corrode the product.

FGI-AMTM grating is manufactured with a proprietary resin system that protects the grating surface from the growth. In addition to protecting the grating surface from bacteria and fungi that cause odors, discoloration and mildew, FGI-AMTM maintains all of the qualities of Fibergrate FGI grating including USDA approvable, an ASTM E84 flame spread index of 25 or less, superior slip resistance and excellent corrosion resistance in many applications.

WallTuf® USDA Panels

(White & Almond)

WallTuf® wall and ceiling liner panels are ideally suited for both industrial and residential interior applications. These waterproof panels are light weight, have an attractive surface texture, absorb scratches and clean up very easily. WallTuf® is a cost-effective alternative to traditional FRP panels.

Unlike competing fiberglass products like Sequentia®, WallTuf® is made from recycled plastic resin. Using recycled / recyclable goods saves landfills and minimizes the mining of virgin materials. Economic reimbursements from more efficient building result in lower operating costs from repairs and maintenance over the life of the building.



Physical Property Guide - Less than 175°F

				Proteus® Natural Homopolymer Polypropylene	Proteus® Natural Co-Polymer Polypropylene	Sanalite®		
Properties				Units	ASTM Test Method	PP	PP	HDPE
Mechanical	1	Specific Gravity	lbs/ft³	D792	.91	.90	.96	
	2	Yield Point	psi	D638	4,800	3,400	4,900	
	3	Elongation At Yield	%	D638	14	11	12	
	4	Tensile Break	psi	D638	4,800	4,800	4,900	
	5	Elongation At Break	%	D638	400	300	350	
	6	Tensile Modulus	psi	D638	190,000	152,000	176,000	
	7	Flexural Modulus	psi	D790	195,000	180,000	170,000	
	8	Izod Impact	ft-lb/ in²	D4020	1.20	8.0	1.3	
	9	Hardness	Type D	D2240	78	72	70	
	10	Static Friction	unit-less	D1894	-	-	-	
	11	Dynamic Friction	unit-less	D1894	-	-	-	
	12	Compressive Modulus	psi	D695	-	-	-	
Thermal	13	Coefficient of Thermal Expansion	°F	D696	-	-	-	
	14	Melting Point	°F	D3418	324	305	260	
	15	Continuous Service Temperature in Air (Max.)	°F	-	180	180	180	
	16	Water Absorption	%	D570	-	-	-	

Values are averages and are not specifications. ASTM test methods are under current procedures.

IMPORTANT: This group of materials may ignite and sustain flame under certain conditions. Caution is urged where any material may be exposed to open flame or heat-generating equipment. Use Material Safety Data Sheets to determine auto-ignition and flashpoint temperatures of materials, or consult our tech support team if additional information about this specific group materials is needed.

Chemical Resistance Guide - Less than 175°F

				Proteus®	Sanalite®	
Chemical				Homopolymer PP & Co-Polymer PP	HDPE	
Chemical Families	1	Acids, Weak, acetic, dilute hydrochloric or sulfuric acid	%	Temp (°F)	A	A
	2	Acids, Strong, conc. hydrochloric or sulfuric acid		73	A	A
	3	Alkalies, Weak, dilute ammonia or sodium hydroxide		73	A	A
	4	Alkalies, Strong, strong ammonia or sodium hydroxide		73	A	A
	5	Hydrocarbons-Aromatic, benzene, toluene		73	U	U
	6	Hydrocarbons-Aliphatic, gasoline, hexane, grease		73	U	U
	7	Ketones, Esters, acetone, methyl ethyl ketone		73	U	U
	8	Ethers, diethyl ether, tetrahydrofuran		73	U	U
	9	Chlorinated Solvents, methylene chloride, chloroform		73	U	U
	10	Alcohols, methanol, ethanol, anti-freeze		73	A	A
	11	Inorganic Salt Solutions, sodium chloride, potassium cyanate		73	A	A
	12	Continuous Sunlight		73	-	-
Food Industry Typical Exposure	13	Hydrogen peroxide	1	73	L	A
	14	Nitric acid	1	73	A	A
	15	Nitric acid	5	176	A	A
	16	Phosphoric acid	1	73	A	A
	17	Phosphoric acid	5	176	A	A
	18	Sodium hydroxide	1	73	A	A
	19	Sodium hydroxide	5	176	A	A
	20	Sodium hypochlorite (300 ppm active chlorine)		68	A	A
	21	Steam sterilization (single autoclaving)	UD	273	U	U
	22	Steam sterilization (repeated autoclaving)	UD	273	U	U
	23	Sulphuric acid	1	73	A	A
	24	Sulphuric acid	3	140	A	A
	25	Water	UD	140	A	A
	26	Water	UD	176	A	A
	27	Water	UD	203	A	A

Key A = Acceptable Service | L = Limited Service | U = Unacceptable

PHYSICAL PROPERTY GUIDE

Physical Property Guide - 175°F to 325°F+

Key A = Acceptable Service | L = Limited Service | U = Unacceptable

				TIVAR® 1000 UHMW-PE	TIVAR® H.O.T. UHMW-PE	Acetron® GP POM-C	Acetron® POM-H	Ertalyte® PET-P	Ertalyte® TX PET-P	
Properties		Units	ASTM Test Method	UHMW Polyethylene	Heat Resistant UHMW Polyethylene	Copolymer Porosity-free Acetal	Homopolymer Acetal	Semi-crystalline Thermoplastic Polyester	Bearing Grade Thermoplastic Polyester	
Mechanical	1	Specific Gravity 73°F	-	D792	0.93	0.94	1.41	1.41	1.41	1.44
	2	Tensile Strength 73°F	psi	D638	5,800	5,800	9,500	11,000	12,400	10,500
	3	Tensile Modulus of Elasticity 73°F	psi	D638	100,000	100,000	400,000	450,000	460,000	500,000
	4	Tensile Elongation (at break) 73°F	%	D638	300	300	30	30	20	5
	5	Flexural Strength, 73°F	psi	D790	3,500	3,500	12,000	13,000	18,000	14,000
	6	Flexural Modulus of Elasticity 73°F	psi	D790	110,000	110,000	400,000	450,000	490,000	360,000
	7	Compressive Strength, 10% Deformation 73°F	psi	D695	3,000	3,000	15,000	16,000	15,000	15,250
	8	Compressive Modulus of Elasticity 73°F	psi	D695	80,000	80,000	400,000	450,000	420,000	400,000
	9	Hardness, Rockwell, Scale as noted 73°F	-	D785	R56	R57	M88 (R120)	M89 (R122)	M93 (R125)	M94
	10	Hardness, Durometer, Shore "D" Scale 73°F	-	D2240	D66	D68	D85	D86	D87	D80
	11	Izod Impact (notched), 73°F	ft. lb. / in. of notch	D256 Type "A"	No Break	No Break	1.0	1.0	0.5	0.4
	12	Coefficient of Friction (Dry vs. Steel) Dynamic	-	MCAM TM 55007	0.12	0.12	0.25	0.25	0.2	0.19
	13	Limiting PV (4:1 safety factor applied)	ft. lbs. / in. ² min	MCAM TM 55007	2,000	2,000	2,700	2,700	2,800	6,000
	14	Wear Factor "k" x 10 ⁻¹⁰	in. ³ - min / ft. lbs. hr.	MCAM TM 55010	371	371	200	200	60	35
Thermal	15	Coefficient of Linear Thermal Expansion (-40°F to 300°F)	in./in./°F	E-831 (TMA)	1.1 x 10 ⁻⁴	1.1 x 10 ⁻⁴	5.4 x 10 ⁻⁵	4.7 x 10 ⁻⁵	3.3 x 10 ⁻⁵	4.5 x 10 ⁻⁵
	16	Heat Deflection Temperature 264 psi	°F	D648	116	116	220	250	240	180
	17	Tg-Glass transition (amorphous)	°F	D3418	N/A	N/A	N/A	N/A	N/A	N/A
	18	Continuous Service Temperature in Air (Max.) ⁽¹⁾	°F	-	180	275	180	180	210	210
	19	Thermal Conductivity	BTU in. / hr. ft. ² °F	F433	2.84	2.84	1.6	2.5	2.0	1.9
Chemical ⁽¹⁾	20	Water Absorption Immersion, 24 Hours	% by wt.	D570 ⁽²⁾	<0.01	<0.01	0.2	0.2	0.07	0.06
	21	Water Absorption Immersion, Saturation	% by wt.	D570 ⁽²⁾	<0.01	<0.01	0.9	0.9	0.9	0.47
	22	Acids, Weak, acetic, dilute hydrochloric or sulfuric acid	@73°F	-	A	A	L	L	A	A
	23	Acids, Strong, conc. hydrochloric or sulfuric acid	@73°F	-	A	A	U	U	L	L
	24	Alkalies, Weak, dilute ammonia or sodium hydroxide	@73°F	-	A	A	A	A	A	A
	25	Alkalies, Strong, strong ammonia or sodium hydroxide	@73°F	-	A	A	U	U	U	U
	26	Hydrocarbons-Aromatic, benzene, toluene	@73°F	-	L	L	A	A	A	A
	27	Hydrocarbons-Aliphatic, gasoline, hexane, grease	@73°F	-	A	A	A	A	A	A
	28	Ketones, Esters, acetone, methyl ethyl ketone	@73°F	-	A	A	A	A	A	A
	29	Ethers, diethyl ether, tetrahydrofuran	@73°F	-	L	L	A	A	A	A
	30	Chlorinated Solvents, methylene chloride, chloroform	@73°F	-	L	L	L	L	U	U
	31	Alcohols, methanol, ethanol, anti-freeze	@73°F	-	A	A	A	A	A	A
	32	Inorganic Salt Solutions, sodium chloride, potassium cyanate	@73°F	-	-	-	A	A	A	A
	33	Continuous Sunlight	@73°F	-	-	-	L	L	L	L
Other	34	Relative Machinability (1-10, 1 = Easier to Machine)	-	-	2	2	1	1	2	2
	35	Flammability @3.1mm (1/8 in.) ⁽²⁾	-	UL 94	HB	HB	HB	HB	HB	HB

(1) Chemical resistance data are for little or no applied stress. Increased stress, especially localized may result in more severe attack. Examples of common chemicals also included.

(2) Estimated rating based on available data. The UL 94 Test is a laboratory test and does not relate to actual fire hazard. Contact Mitsubishi Chemical Advanced Materials for specific UL "Yellow Card" recognition number.

PHYSICAL PROPERTY GUIDE

	Nylatron® MC907 PA6	Nylatron® LFG PA6	Nylatron® Nylon 101 PA66	Fluorosint® 207 PTFE	Fluorosint® HPV PTFE	Techtron® PPS	Techtron® HPV PPS	Ketron® 1000 PEEK	Sultron™ PSU	Duratron® U1000 PEI	Sultron™ PPSU
	Monocast® FDA compliant Type 6	Oil-Filled Type PA6	Unfilled Type PA66	Synthetic Mica-Filled PTFE	Synthetic Mica-Filled PTFE	Polyphenylene sulfide	Bearing Grade Polyphenylene sulfide	Poly-etheretherketone	Unfilled Polysulfone	Unfilled Polyetherimide	Unfilled Polyphenylsulphone
1	1.15	1.14	1.15	2.3	2.06	1.35	1.43	1.31	1.24	1.28	1.29
2	12,000	9,900	11,500	1,500	1,500	13,500	10,900	16,000	10,200	16,500	11,000
3	400,000	465,000	425,000	250,000	230,000	500,000	540,000	630,000	390,000	500,000	340,000
4	20	50	50	50	100	15	4	40	30	80	30
5	16,000	15,000	15,000	2,000	2,500	21,000	10,500	25,000	15,000	20,000	15,500
6	500,000	525,000	450,000	350,000	165,000	575,000	535,000	600,000	400,000	500,000	345,000
7	15,000	13,500	12,500	3,800	4,000	21,500	15,500	20,000	13,000	22,000	13,400
8	400,000	330,000	420,000	225,000	73,000	430,000	342,000	500,000	375,000	480,000	280,000
9	M85 (R115)	M85 (R120)	M85 (R115)	R50	R54	M95	M84	M100 (R126)	M82 (R128)	M112 (R125)	M80 (R120)
10	D85	-	D80	D65	-	D85	-	D85	D80	D86	D80
11	0.4	1.0	0.6	1.0	1.8	0.6	1.4	1.0	1.3	0.5	2.5
12	0.2	0.14	0.25	0.1	0.15	0.4	0.2	0.4	-	0.42	-
13	3,000	6,000	2,700	8,000	18,750	3,000	8,750	8,500	-	1,875	-
14	100	72	80	30	22	2,400	62	375	-	2,900	>1,000
15	3.5 x 10 ⁻⁵	5.6 x 10 ⁻⁵	5.5 x 10 ⁻⁵	5.7 x 10 ⁻⁵	4.9 x 10 ⁻⁵	2.8 x 10 ⁻⁵	3.3 x 10 ⁻⁵	2.6 x 10 ⁻⁵	3.1 x 10 ⁻⁵	3.1 x 10 ⁻⁵	3.1 x 10 ⁻⁵
16	200	200	200	210	180	250	240	320	340	400	405
17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	374	410	428
18	200	220	210	500	500	425	430	480	300	340	300
19	1.7	1.7	1.7	-	-	2.0	2.1	1.75	1.8	0.85	2.4
20	0.6	0.3	0.3	0.03	0.15	0.01	0.01	0.1	0.3	0.25	0.37
21	7	6	7	0.2	0.43	0.03	0.09	0.5	0.6	1.25	1.1
22	L	L	L	A	A	A	A	A	A	A	A
23	U	U	U	A	A	L	L	L	U	U	L
24	L	L	L	A	A	A	A	A	A	A	A
25	U	U	U	U	U	A	A	A	U	U	A
26	A	A	A	A	A	A	A	A	U	U	L
27	A	A	A	A	A	A	A	A	L	L	A
28	A	A	A	A	A	A	A	A	U	U	U
29	A	A	A	A	A	A	A	A	L	A	L
30	L	L	L	A	A	A	A	A	U	U	U
31	L	L	L	A	A	A	A	A	A	A	L
32	A	A	A	A	A	A	A	A	A	A	A
33	L	L	L	A	A	L	L	L	L	A	L
34	1	1	1	1	1	3	3	5	3	3	3
35	HB	HB	V-2	V-0	V-0	V-0	V-0	V-0	HB	V-0	V-0

Chemical Resistance Guide - 175°F to 325°F+

Chemical	%	Temp (°F)	TIVAR® 1000 UHMW-PE	Acetron® GP POM-C and Acetron® POM-H	Ertalyte® PET-P and Ertalyte® TX PET-P	Nylatron® MC901 PA6	Fluorosint® PTFE	Techtron® PPS and Techtron® HPV PPS	Ketron® 1000 PEEK	Sultrion™ PSU	Duratron® U1000 PEI	Sultrion™ PPSU
Hydrogen peroxide	1	RT	A	A	A	C	A	A	A	A	A	A
Nitric acid	1	RT	A	C	A	B	A	A	A	A	A	A
Nitric acid	5	80	-	C	C	C	A	A	B	A	B	A
Phosphoric acid	1	RT	A	C	A	B	A	A	A	A	A	A
Phosphoric acid	5	80	U	C	B	C	A	A	A	A	A	A
Sodium hydroxide	1	RT	A	A	A	A	A	A	A	A	A	A
Sodium hydroxide	5	80	A	A	C	C	B	A	A	A	B	A
Sodium hypochlorite (300 ppm active chlorine)		20	A	B	A	B	A	A	A	A	A	A
Steam sterilization (single autoclaving)	UD	134	U	A	A	A	A	A	A	A	A	A
Steam sterilization (repeated autoclaving)	UD	134	U	C	C	C	A	A	A	A	A	A
Sulphuric acid	1	RT	A	A	A	B	A	A	A	A	A	A
Sulphuric acid	3	60	A	C	A	C	A	A	B	A	A	A
Water	UD	60	A	A	A	A	A	A	A	A	A	A
Water	UD	80	A	A	B	B	A	A	A	A	A	A
Water	UD	95	A	B	C	C	A	A	A	A	A	A

Key

Resistance ratings:

- A: Resistant. Little or no change in weight. Small effect on mechanical properties. In general acceptable service life.
- B: Partially resistant. In course of time, there is a distinct deterioration in mechanical properties and a change in weight. In many cases a short term exposure or limited number of cleaning cycles may be considered allowable (to be evaluated by practical testing).
- C: Non-resistant. After a short time, the material is seriously affected (considerable reduction of the mechanical strength and changes in weight). Using the material under these conditions is not recommended.
- NA: Not applicable for this material

Concentration (%):

- A number, e.g. 5, indicates "5g of solute per 100g of aqueous solution" (5% by weight).
- UD: Undiluted (technically pure chemical)

Temperature (°C):

- RT: Room temperature (15 - 25°C)

Important considerations regarding chemical resistance, cleaning and autoclaving:

Many factors can affect chemical resistance of a material, and it is virtually impossible to test and provide data for all potential combinations to which an application can be exposed. Chemical resistance, autoclaving and cleaning data from any source can only serve as a guideline based on tests at specific conditions. The user must make his own determination of a material's suitability for use based on testing of finished parts in their practical environment.

Variables—alone or in combination—that can affect chemical resistance and should be considered include the influence of machined-in stresses, assembly and application loads, part design, cleaning cycle times, pressures, chemical concentrations and combinations, and temperatures.

Ratings in the data above—derived from raw material supplier data, literature on chemical resistance of plastics, and from experience—are a guideline only and refer to unstressed parts. In particular the amorphous thermoplastics (PC, PSU, PEI and PPSU) are sensitive to "stress cracking" under certain conditions. Thus, environments normally harmless to unstressed parts may cause stress cracking in contact with stressed parts.

Mitsubishi Chemical Advanced Materials has an extensive database of chemical resistance information. Please feel free to contact our technical services group for more specifics about your application.

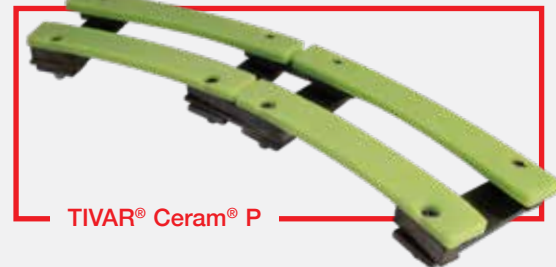
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Mitsubishi Chemical Advanced Materials manufactures a wide range of profile shapes, narrow board stock and tube from FDA and NSF compliant TIVAR® UHMW-PE. Many shapes can be shipped from stock, with custom shapes and formulations possible with short lead times.

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<p>EPP634</p>	<p>EPP707</p>
<p>EPP801</p>	<p>EPP851</p>
<p>EPP704</p>	<p>Your Idea Here</p>

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Mitsubishi Chemical Advanced Materials can manufacture series parts machined from materials like TIVAR® UHMW-PE, Nylatron® PA6, Ertalyle® PET-P and all the other products we've developed for the Food Processing and Packaging Industry. Send us a drawing and we'll help you find the best way to produce your design. No one knows more about designing and manufacturing parts from these materials than the people who invented them.

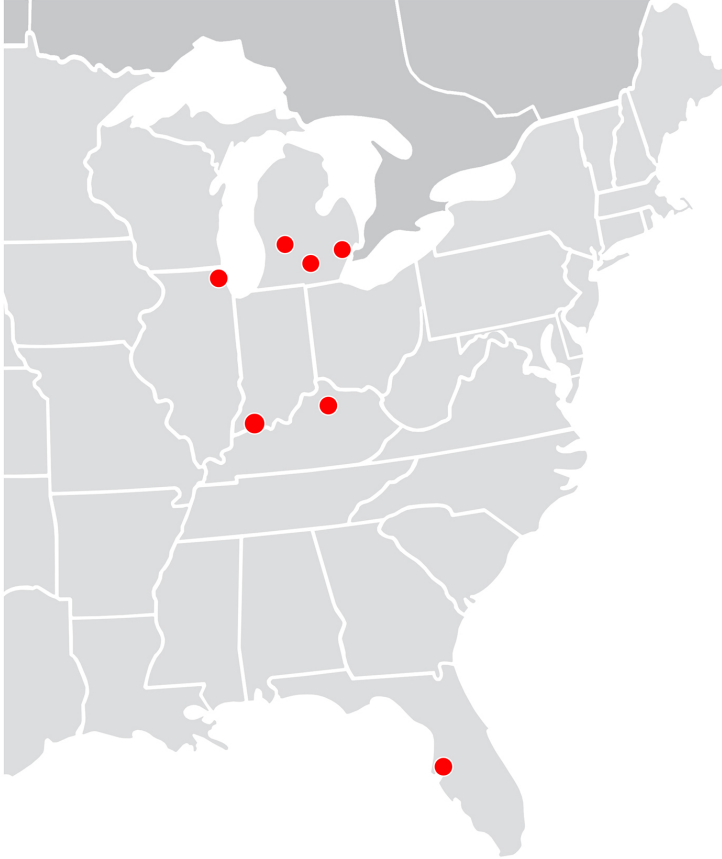


Problem Solvers For Non-food Contact Applications

TIVAR® Dryslide is ideal for chutes, slides and conveyor systems that move packaged products. TIVAR® Dryslide is widely used by catalog and parcel services and is just being introduced to manufacturers of food and food production equipment. TIVAR® Dryslide eliminates the need for coatings or lubricants applied to handling systems and removes the chance for unsafe behavior associated with relieving jammed lines.

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