

Metal Detectable Engineering Plastics



Engineering Plastics Solutions
for Food & Dairy Production





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Trends

The foremost goal in the food and beverage production & packaging industry is to deliver high quality, healthy and safe products. A highly regulated market where not meeting international standards can quickly become a major threat to the business, a product recall could turn into the worst case scenario for a producer. At the same time, market dynamics force a continuous cost and productivity improvement.

Producers need to prevent contamination of food caused by e.g. breakage or wear of equipment parts, using predominantly metal detectors. Replacing equipment parts with engineering plastics can improve production speed or extend productive cycles of machines due to reduced downtime significantly.

The growing demand for polymer materials as a replacement of metal parts presents strong demand for new and improved, metal detectable plastics.

Solutions

Mitsubishi Chemical Advanced Materials developed a range of traceable polymer materials, which offer superior properties compared to metal or existing plastics. The manufacturer will be able to choose from a range of products based on the application and the most critical material quality.

Key material properties:

- Improved wear resulting in less breakage of highly stressed plastic parts in production and process equipment
- Material additives allow detection of very small (27 mm³ and bigger) particles via metal detectors addressing the remaining risk of occurring breakage or wear

Key Benefits

- Improved safety supported by food contact compliant and metal detectable plastic materials with FDA and EU food regulation approvals
- Reduced contamination of food, resulting in less related costs and reduced financial and image risk
- Longer productive periods and lower maintenance costs



Acetron® MD – POM – Blue

- Good balance of stiffness and impact strength for applications where higher dimensional stability is required
- Metal and visual detection by blue colour
- Detection by x-ray also possible
- Continuous use temperature up to 105 °C (221 °F)

Applications:

- Scrapers
- Funnels
- Guiders
- Grippers
- Gears



Nylatron® MD – PA 6 – Light Blue

- High wear and fatigue resistance
- Lower moisture absorption than standard PA6
- Metal and visual detection by blue colour
- Detection by x-ray also possible
- Continuous use temperature up to 85 °C (185 °F)

Applications:

- Thrust washers
- Seals
- Rolls



TIVAR® MD – PE-UHMW – Dark Blue

- Lower cost material solution for applications with the need for high impact resistance
- Medium dimensional stability due to extreme low water absorption, but high Coefficient of Linear Thermal Expansion (CLTE)
- Good performance in cryogenic environment
- Excellent release properties
- No detection by x-ray

Applications:

- Chain guider elements
- Funnels
- Rolls
- Bushings



Ketron® MD PEEK – PEEK – Blue

- Used in applications where high line speeds require good wear resistance or where operating temperatures in use are higher than 130 °C (266 °F)
- For multiple sterilizable machine parts, mainly in equipment with CIP or SIP (sterilisation in place)
- Resistant to steam
- Suitable for food approved parts requiring high stiffness without reinforcements
- High dimensional stability for high precision parts
- Detection by x-ray also possible
- Good impact/stiffness ratio



Applications:

- Filling pistons
- Manifolds
- Valves
- Scrapers in cookers and high temperature mixers
- Hot oil applications in fryers and ovens
- Thrust washers
- Guiders
- Bushings

The material will be produced on demand. Please contact us with your enquiry.

Food Grade Products

Stock Shapes	Base Polymer	DoC 1935/2004 acc. to (EU) 10/2011 Food Grade (1)	FDA compliant (2)
Ketron® MD PEEK blue	PEEK	+	+
Nylatron® MD blue	PA 6	+	+
Acetron® MD blue	POM-C	+	+
TIVAR® MD blue	PE-UHMW	+	+

- + Complies with the requirements of the regulations.
 - Does not comply with the requirements of the regulations.
 NT Has not been tested according to the requirements of the regulations.
 IT Tests according to the requirements of the regulations are on-going

[1] Food Grade: Mitsubishi Chemical Advanced Materials European new "Food Grade" designated products comply with the requirements mentioned in the Regulation [EC] No 1935/2004 and the Regulation (EU) 10/2011. Further our "Food Grade" products are manufactured according to Good Manufacturing Practice [GMP] as set out in Regulation [EC] No 2023/2006.

[2] This column gives the compliance of the raw materials used for the manufacture of the Mitsubishi Chemical Advanced Materials Stock Shapes with respect to their composition as set out in the United States of America (FDA) for plastic materials and articles intended to come into contact with foodstuffs.

Industries

Food Processing

- Meat processing
- Dairy production
- Cheese processing
- Pasta/dough processing
- Sweets processing
- Filling/bottling

Food Packaging

- Applications in direct contact with foodstuff

Material Solutions

Manufacturers constantly need to look for ways to increase production speed. Mitsubishi Chemical Advanced Materials broad range of high performance proprietary machinable plastics meet that challenge whether it's the

dimensional stability for increased wear, eliminating costly lubrication or withstanding increased temperatures and more aggressive chemical environments. Following an overview of our material portfolio for the food industry.

Values based on «Temperature of deflection under load» (ISO 75 / Method A: 1,8 Mpa)*

< 80 °C (< 176 °F)	80 – 120 °C (176 – 248 °F)	120 – 160 °C (248 – 320 °F)	> 160 °C (> 320 °F)
TIVAR® Oil Filled (UHMW-PE + oil)	Ertalon® 6 SA (PA 6)	Techtron® HPV PPS (PPS + solid lubricant)	Sultron™ 1000 PSU (PSU)
TIVAR® SurfaceProtect (UHMW-PE + other additives)	Ertalyte® TX (PET + solid lubricant)	Altron™ 1000 PC (PC)	Duratron® U1000 PEI (PEI)
TIVAR® 1000 (UHMW-PE)	Nylatron® SLG (PA 6 + oil)	Ketron® TX PEEK (PEEK + solid lubricant)	Sultron™ PPSU (PPSU)
TIVAR® CleanStat (UHMW-PE + specific additives)	Ertalon® 6 PLA (PA 6)	Ketron® 1000 PEEK (PEEK)	
TIVAR® H.O.T. (UHMW-PE + specific additives)	Ertalyte® (PET)	Ketron® MD PEEK (PEEK + additives)	
TIVAR® MD (UHMW-PE)	Ertalon® 66 SA (PA66)		
	Ertacetal® C (POM-C)		
	Fluorosint® 207 (PTFE + mica)		
	Ertacetal® H (POM-H)		
	Acetron® MD (POM) Nylatron® MD (PA 6)		

* Engineering Note:

A material's heat resistance is broadly characterized by both its «temperature of deflection under load» and its «max. continuously allowable service temperature». The «temperature of deflection under load», formerly called «Heat Deflection Temperature (HDT)», is related to a certain level of stiffness at elevated temperature and it is often considered as the max. temperature limit for moderately to highly stressed, unconstrained components. The «maximum continuous use temperature» on the other hand is related to a certain level of permanent physical property degradation which occurs after long term exposure to elevated temperature (thermal-oxidative degradation).

Material Recommendations for Various Applications

Applications	Products
Seals	Fluorosint® 207 PTFE
Separation Disc	Ertacetal® C POM-C
Stripper	TIVAR® 1000 UHMW-PE
Guide for Cutter	TIVAR® 1000 UHMW-PE
Grinder Bushing	Ertalyte® TX PET-P
Trust Washers	Ertalyte® TX PET-P
Cams	Ertalyte® TX PET-P
Forming Plates	Ertacetal® C POM-C

Applications	Products
Gears	Nylatron® SLG PA6
Bushings	Ertalyte® TX PET-P
Needle Guides	Ertacetal® C POM-C
Holding Blocks	TIVAR® 1000 UHMW-PE
Chain Blocks	Ertacetal® C POM-C
Chain Guides	TIVAR® 1000 UHMW-PE
Wear Strips	TIVAR® 1000 UHMW-PE
Mixing Paddles	Ketron® 1000 PEEK

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