
mitsui
MITSUI PLASTICS, INC

SUSTAINABLE & SPECIALTY AUTOMOTIVE MATERIALS



MITSUI PLASTICS, INC.

MITSUI & CO.

www.mitsuiplastics.com

ON THE CUTTING EDGE OF SUSTAINABLE AUTOMOTIVE TECHNOLOGIES & SPECIALTY PRODUCTS

OCEAN RECLAIMED – PA6, PC-ABS/PET

BIO-BASED – PC, PA56, PBT, TPEE, PU

POST-CONSUMER RECYCLED (PCR) – TPO, PP, PC, ABS, PC-ABS, PC-ASA, HDPE, HIPS, PBT, TPEE

POST-INDUSTRIAL RECYCLED (PIR) - ABS, PC-ABS, PC-ASA, PA6, PA66, PBT, PBT-ASA

CARBON SEQUESTERING MATERIAL – POLYKETONE (PK)

VIRGIN SPECIALTY LIGHTING – PMMA, PC, SI-PC, ASA

Ocean Reclaimed PA6, & PC-ABS/PET



These ocean bound plastic certified products use sources like water bottles and fishnets to service the automotive and electronic industries. Product offerings using ocean reclaim materials include:

PA6

- Glass filled options varying from 30%-50% available.
- Mineral filled options varying form 15%-25% available.
- Ocean recycled content varying from 30%-50% available.
- Applications Include: Engine Covers, Air Cleaners, Frunk, Etc.

PC-ABS/PET

- Ocean recycled content varying from 5-10% available.
- Additional 40-45% post-consumer recycled content available.
- Applications Include: Guide Brackets, Rear Monitor Covers, Etc.

Up To
80%
Reduction In
CO₂
Emissions

While using ocean reclaimed plastics to reduce CO₂ emissions, these products still main all the following characteristics:

- Tensile Strength
- Flexural Modulus
- Flexural Strength
- Impact Strength
- Shrinkage
- Izod Impact



Bio-Based PC



Up To
56%
BIO CONTENT

• This Polycarbonate boasts approximately **56% bio-bontent** from its feedstock Isosorbide, which is derived from plant-based glucose.

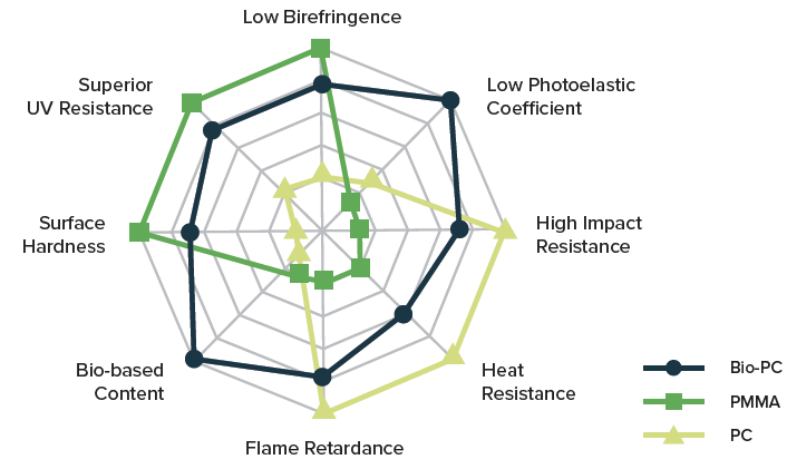
• **Key Features:**

- Low Birefringence
- Low VOCs
- Great Surface Hardness
- Great UV Resistance
- Improved Melt Flow Properties
- Minimized Friction In-Mold

• This Bio-PC is used in many glass substitution applications because of its highly optical characteristics.

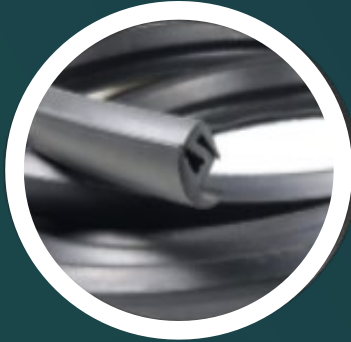
• **Other Applications include:**

- HUD Screens
- Center Fascia Displays
- Dashboard Screens
- SCC Cover
- Light Guide Lens



mitsubishi

Bio-Based PA56, PBT, & TPEE



Bio-Based PA6, PBT, and TPEE are compounded using bio-monomers derived from industrial sourced corn and sugar cans.

Up To
50%

Reduction In
CO₂
Emissions

PA56

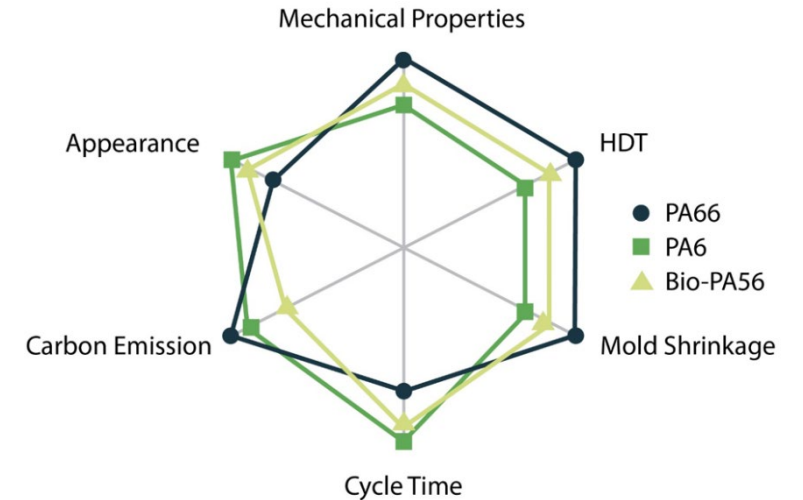
- PA6 and PA66 equivalents available.
- 30% and 50% glass filled options are available.
- Mechanical properties are on par with virgin PA6 or PA66.
- Enhanced visual appearance.

PBT & TPEE

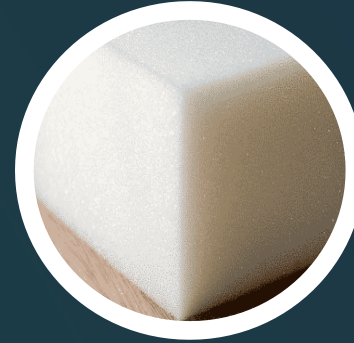
Currently only available for pilot samples.

Mass production will begin in 2024.

Spider Map (comparison with PA6, 66)



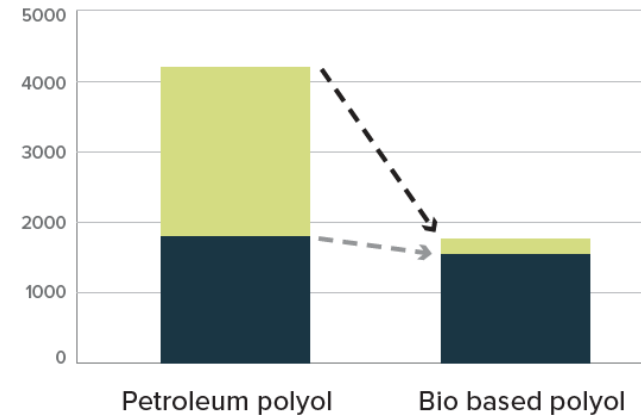
Bio-Based PU



15%
BIO Content
PRODUCES
50% LESS CO₂

- This bio-based Polyurethane is derived from non-edible plants, such as castor seeds.
- Bio-content in final products are approximately 15%.
- This bio-based PU only produces approximately 50% of the CO₂ exhaust that is produced by Petroleum-based PU.
- Seat cushions made from the Bio-PU notice increased riding comfort, and increased ball rebound.

LIFE CYCLE ASSESSMENT



QUANTITY OF CO₂ OUTBREAK OF THE BIO-POLYOL IS HALF OF THE PETROLEUM POLYOL.

■ Thermal recycling
■ Production process

Post-Consumer Recycled TPO, & PP



• **Post-consumer source recycled material is used to create products capable of being used as drop-in replacements for Polypropylene (PP) and Thermoplastic Polyolefins (TPO) applications.**

• 20%-30% PCR options are:

- Currently in mass production.
- Approved towards Ford, GM, and Stellantis specifications with, drop-in replacement options for Toyota part approvals.
- Vast mold-in color capability, with speckled color development.

APPLICATION	TALC CONTENT (%)	PCR CONTENT (%)
Fascia, Exterior Trim (Mold-In-Color or Paint)	16	30
Fascia, Exterior Trim (Paint)	16	30
Interior Garnish Trim (Mold-In-Color)	10	20
Interior Garnish Trim (Mold-In-Color)	20	30

Post-Consumer Recycled PP, ABS, HDPE, & HIPS

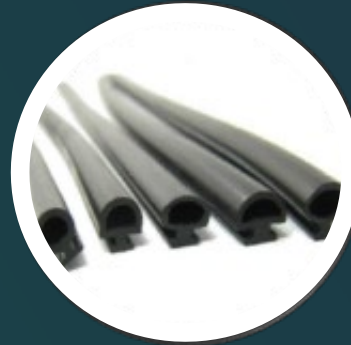


Compounded
With
100%
High Purity
PCR

- High purity 100% PCR based PP, ABS, HDPE, and HIPS materials compounded from the PCR sourced detailed to the right.
- Excellent traceability from in-house supplier monitoring software.
- Advanced R&D and quality control systems:
 - Custom grade support readily available upon request.
 - Custom formulations have been developed for automotive, electronics, and many other consumer industries.
- Abundant PCR recovery sources, allowing for potential of rapid increase in volume production.

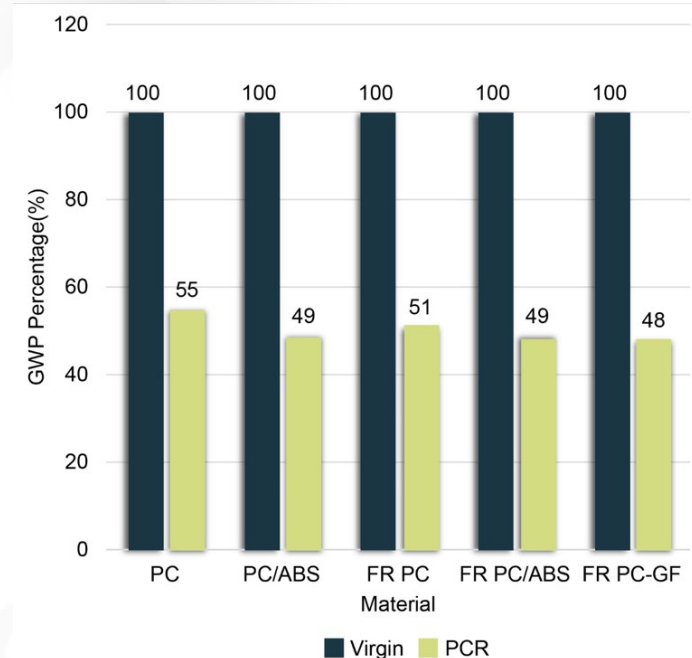
Material	Capacity (T/Year)	PCR Sources	Source %
PP	65,000	TV	80%
		Refrigerator	8%
		Air Conditioner	2%
		Computer	3%
		Automotive	2%
		Others	5%
ABS	60,000	TV	7%
		Washing Machine	45%
		Refrigerator	30%
		Air Conditioner	5%
		Computer	5%
		Automotive	4%
HIPS	55,000	TV	5%
		Washing Machine	80%
		Refrigerator	3%
		Automotive	2%
		Others	10%
HDPE	20,000	Food or Drink Bottles	55%
		Consumer Goods	35%
		Others	10%

Post-Consumer Recycled PC, PC-ABS, PC-ASA, PBT, TPEE



- From a mechanical recycling process, high-quality PCR sourced from wafer trays, headlamps, sheets, airbags, and cable ties is compounded into PC, PC-ABS, and/or PC-ASA
- Chemically recycled PBT and TPEE is available for sampling/development, and will be in mass production by 2025.

Material	PCR Content (%)	Features	Applications
Non-Reinforced PC	30% - 90%	Transparent MIC Impact Modified	Transparent Sheets Automotive Lamps Smart Devices
Reinforced PC	30% - 60%	Glass Filled	Bezels Laptop Covers
Non-Reinforced PC-ABS & PC-ASA	30% - 60%	Paintable Plateable	Automotive Badges Automotive Logos Automotive Interior/Exterior
Reinforced PC-ABS	10% - 50%	Mineral Filled Glass Filled	Automotive Interior Bezels



Post-Industrial Recycled (PIR) Material



**>75%
RECYCLED
CONTENT**

- This high-quality post-industrial recycled material comes as a drop-in replacement for:
 - ABS
 - PC-ABS
 - PC-ASA
 - PBT
 - PBT-ASA
 - Nylon or:
 - PA6 (Polyamide 6)
 - PA66 (Polyamide 66)
- All grades maintain their key technical specifications while having a **PIR content of >75%**, which in turn greatly reduces their global warming potential upon manufacturer.
- Multiple OEM approvals including GM, Stellantis, VW, BMW, Audi, and more.

MATERIAL	CURRENT APPLICATION	PIR CONTENT (%)		GWP (KG CO ₂ EQ)	
		VIRGIN	RECYCLED	VIRGIN	RECYCLED
ABS	Door Panels, Armrests, Bumpers, Rear Spoilers, Lamp Brackets	0	>80	>3.41	<2.05
PC-ABS	Center Console, Glove Box, Dashboard, Decorative Strips	0	>75	>3.87	<2.32
PC-ABS GF	Back Injection of Wooden/ Aluminum Trim, Brackets, Functional Parts	0	>80	>3.52	<2.42
PA6	Engine Design Cover, Powertrain	0	>75	>5.74	<3.98
PA66	IP, Fan Frames, Headlight Actuator Housing	0	>75	>5.28	<3.59

Carbon Sequestering Material – Polyketone (Pk)

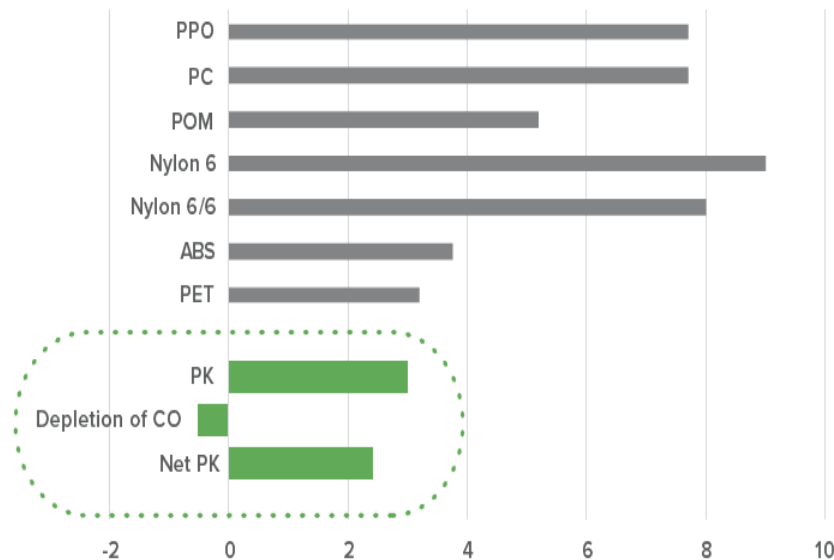


- Polyketone is a new green polymeric material composed of carbon monoxide and olefins, that utilizes carbon monoxide in its manufacturing.

• Polyketone has been used to replace:

- PA6
- PA66
- POM
- PBT
- Various GF, and MF options available.

CO₂ EMISSIONS BY MATERIAL (KG OF CO₂/KG OF PLASTIC)



- **Some of Polyketone's unique features include:**
- Antimicrobial Properties:
 - **99.9% Reduction in Staphylococcus Aureus**
 - **99.4% reduction in Escherichia Coli**
- Little To No VOCs
- High Impact Strength
- Anti-Squeak
- High Chemical Resistance
- Good Wear & Abrasion Behavior
- Good Flame-Retardancy
- Lower Cycle Times With High Rate of Crystallization

VIRGIN SPECIALTY LIGHTING – PC, SI-PC, PMMA



EDGE GLOW

- This is a unique light transmitting Polycarbonate (PC) or PMMA, that allows light to be transmitted through the material and produce bright flashy edging on the material.
- **Some applications include:**
 - Instrument Panels
 - Door Sill Plate
 - Dashboard Trim
 - Bezel Ring
 - Tail lights
- This specialty material can come in many colors with light transmitting capabilities, such as: Red, blue, green, purple, pink, yellow, orange, and many more, with options for development.

SILOXANE COPOLYMER POLYCARBONATE (Si-PC)

- This high-strength Si-PC is used to provide advanced lighting solutions instead of conventional painting/plating.
- Can meet various colors and shades while allowing light to diffuse through the material.
 - Can be transparent, translucent (haze), or opaque.
- **Can be used on applications such as:**
 - Center Fascia
 - Buttons
 - Mood Lamp Cover
 - Translucent Dashboard
 - Light Translucent Grill

PMMA LIGHTING

- This high-transparency PMMA has excellent chemical resistant, weatherability, and boasts strong surface hardness for interior/exterior lighting applications, and other trim applications.
- **Some applications include:**
 - Light Guide Lens
 - Rear Combination Lamps
 - Turn Signal Trim
 - Cluster Window Lens
 - Door Pillar Garnish
 - Front Grille
 - Ambient Mood Lighting
- This PMMA can come in a variety of colors, with options to glitter the material of various applications.

Thank you!

For More Information & Samples:

Contact your Mitsui representative

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