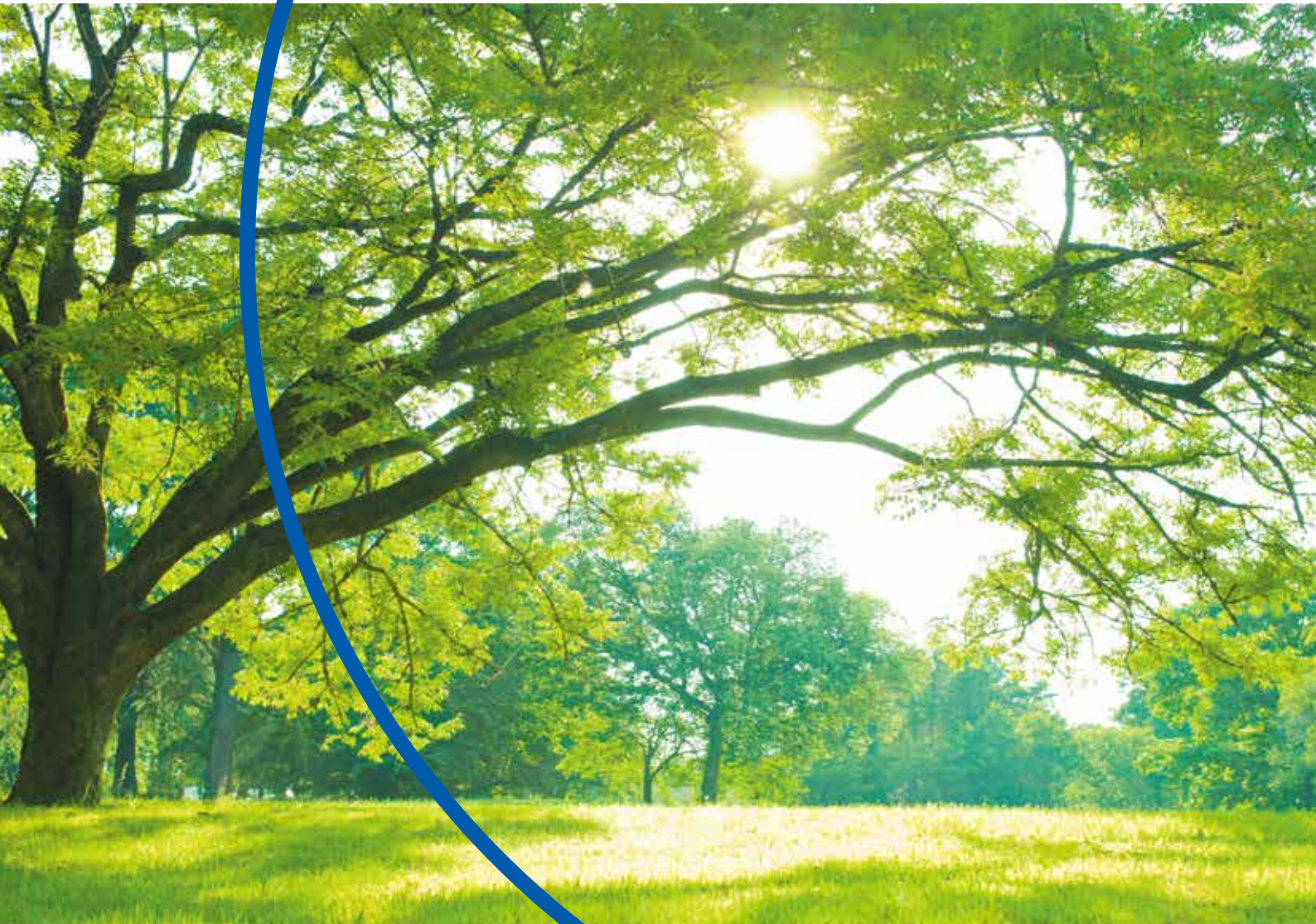


Engineering Plastics

XANTAR™
DURABIO™
NOVADURAN™



Cutting-edge technology Takes the new To the Beyond.

Our lineup of engineering plastics with excellent heat resistance and functions such as high hardness, flame resistance, optical properties, and electrical properties.

Materials for automobiles , electronics, healthcare, and other fields.

Accelerate environmentally friendly initiatives through reduction of hazardous substances, bio-based raw materials, recycling, etc.





Polycarbonate resin (PC) **XANTAR™**

XANTAR™ has excellent transparency, impact resistance, flame resistance, heat resistance, and electrical properties, and is a proven amorphous engineering plastic product that has been used for many years in a wide range of applications.

In addition to differentiated grades specialized for hardness and optical properties, we also offer a lineup of environmentally friendly products such as recycled materials and PFAS-free flame retardant materials to meet customer needs and contribute to global environmental conservation.



Biomass polycarbonate resin (PC) **DURABIO™**

DURABIO™ is an amorphous biomass engineering plastic product made from plant-derived raw materials.

With its excellent balance of physical properties, high designability, and high durability, it is increasingly used for automotive interior and exterior parts and optical applications. It is listed on the positive list as a biomass plastic, and further expansion is expected.



Polybutylene terephthalate resin (PBT) **NOVADURAN™**

NOVADURAN™ is a crystalline engineering plastic product with excellent chemical resistance, heat resistance and moldability.

In addition to stable quality and production based on our long track record, we contribute to our customers' value creation by proposing innovative materials such as "ultra-low warpage" and "ultra-low specific gravity," which far surpass the level of conventional materials.

Mobility



Automotive interior components

Taking advantage of its excellent moldability and high surface hardness, we have a lineup of products and grades suitable for various interior components such as audio panels, heater control panels, and touch panel lenses. XANTAR CP series offers excellent plating performance, high impact resistance and heat stability.

DURABIO, with its excellent balance of physical properties, offers superior chemical resistance and scratch resistance, and enables paint-free parts.

Recommended Products

XANTAR

- K series
 - CP series
 - Reinforcement grade of ultra-low CLTE & -low anisotropy
- #### DURABIO

*CLTE: Coefficient of Linear Thermal Expansion

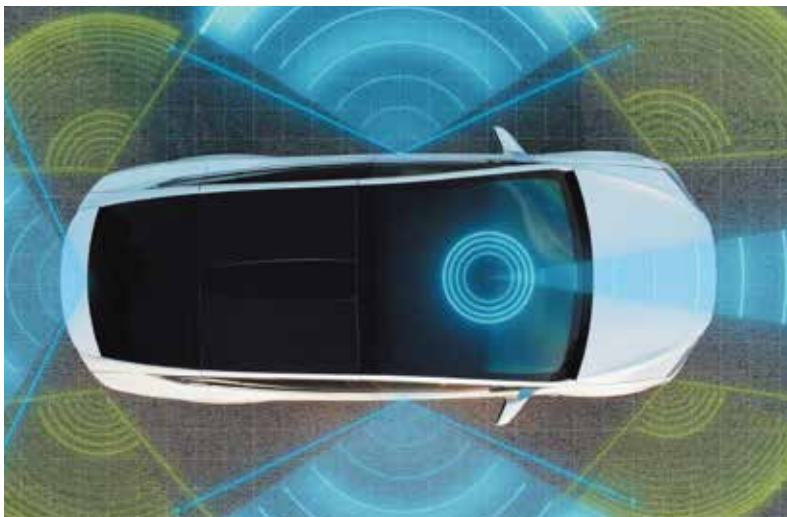
Automotive exterior components

DURABIO has high designability as well as functional aspects such as impact resistance, scratch resistance, and weather resistance to withstand automotive exterior applications. It can be used for exterior parts such as front grilles, rear spoilers, and pillar garnishes. Its excellent transparency makes it ideal for electrical and decorative parts, which are on the rise in the mobility revolution (CASE). XANTAR reinforcement grade of ultra-low CLTE & -low anisotropy has a coefficient of linear expansion equivalent to that of metal, replacing metal and reducing weight.

Recommended Products

XANTAR

- Reinforcement grade of ultra-low CLTE & -low & anisotropy
- #### DURABIO



Sensor peripheral components

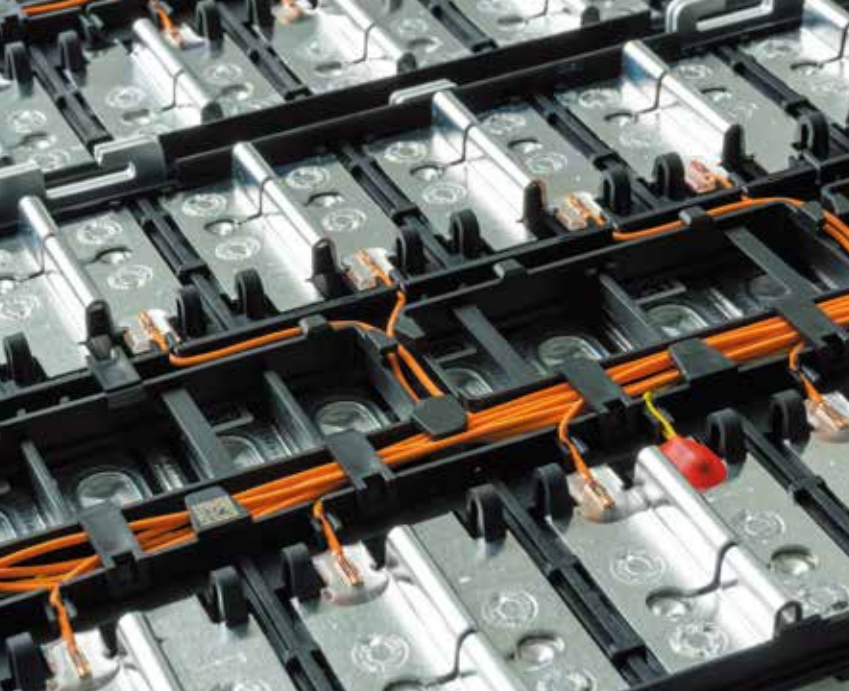
Electromagnetic wave management is an indispensable element for sensors with increasingly sophisticated functions. Mitsubishi Chemical has a group of materials that absorb and shield electromagnetic waves, and by applying these materials to housings, etc., it is expected to prevent sensor malfunctions and improve accuracy.

The XANTAR selected wavelength absorption grades also have high surface hardness and can be used in optical filters such as DMS, LiDAR.

Recommended Products

XANTAR

- Selected wavelength absorption grade
- #### DURABIO
- NOVADURAN
 - RA series
 - RK series



Battery peripheral parts

In addition to high chemical resistance to withstand harsh operating environments, our product lineup includes grades with excellent electrical insulation, flame resistance, and impact strength. They can be used for parts around chargers of electric vehicles, battery housings, etc.

■Recommended Products

- XANTAR
 - XRM series
 - FC series
- NOVADURAN
 - Low warpage flame retardant grade

Head-up display (HUD) peripheral parts

Materials with high dimensional accuracy, rigidity, and heat resistance can be used for HUD enclosure components. In recent years, as the volume of projected information increases, HUD enclosures are becoming larger and larger.

Materials with excellent surface accuracy and optical properties are suitable for mirrors and translucent components.

■Recommended Products

- XANTAR
 - Low birefringence grade
 - Selected wavelength absorption grade
- DURABIO
- NOVADURAN
 - LX series



Railroad interior components

We have materials that conform to the European Railway Flame Retardant Standard EN45545-2, which defines high fire protection requirements. The use of these materials allows for designs that cannot be achieved with conventional thermosetting resins, and also allows for recyclability and weight reduction.

■Recommended Products

- XANTAR
 - Railway flame retardant grade

Electronics



Smart phone

The high surface hardness and transparency, impact resistance, have made it widely used for smartphone rear panels and other applications. The optimum grade can be selected from a large selection of grades according to the required specifications (hardness, flame resistance, and rigidity). XANTAR LDS series is suitable for antenna components.

■Recommended Products

XANTAR

• K series

• LDS series

DURABIO

Wearable device

The high surface hardness, transparency, impact resistance, and high fluidity of this material have made it suitable for wireless earphone components and watch bezels. We also have a lineup of materials with high refractive index and impact resistance suitable for the lenses of smart glasses, which are required in the XR market where demand is expected to grow in the future.

■Recommended Products

XANTAR

• K series

• High refractive index grade

• LDS series

DURABIO



Laptop

With its high impact resistance, it has been used in many chassis parts for notebook PCs and mobile terminals.

The use of dissimilar material bonding grades, which exhibit high bonding properties with metal members, enables composite designs of resin and metal members, which are expected to balance functions such as light weight and heat dissipation.

■Recommended Products

XANTAR

• Recycled carbon fiber reinforced grade

• LDS series

DURABIO

NOVADURAN

• Dissimilar material bonding grade

Health Care



Medical equipment

Polycarbonate resin, with its transparency, strength and safety, is widely used in medical applications. XANTAR medical grade is compatible with gamma ray and electron beam sterilization in addition to steam and EOG sterilization used in the medical field, and has a long track record in the field of medical devices such as artificial lungs and dialyzers.

- Recommended Products
XANTAR
· Medical grade
DURABIO

Cosmetics containers

High transparency, high gloss, scratch resistance, and impact resistance make it suitable for high-end packaging such as cosmetics containers.

- Recommended Products
XANTAR
· K series
DURABIO



Bacteria repellent property

DURABIO's high biomass grade has been recognized for its low bacterial adhesion, which prevents E. coli and other bacteria from adhering to it. It is expected to be applied not only to the housing of healthcare products, but also to parts that are in frequent contact with each other.

Commitment to High Functionality



High hardness polycarbonate

XANTAR K series **DURABIO**

It is a transparent material with improved surface hardness compared to conventional polycarbonate resin. It combines the advantages of polycarbonate and acrylic, and has a low dielectric loss tangent and high amine resistance. A wide range of high performance grades are available, including high flame resistance (1.0mmV-0), low birefringence, high transparency, and high rigidity.

Coating-less

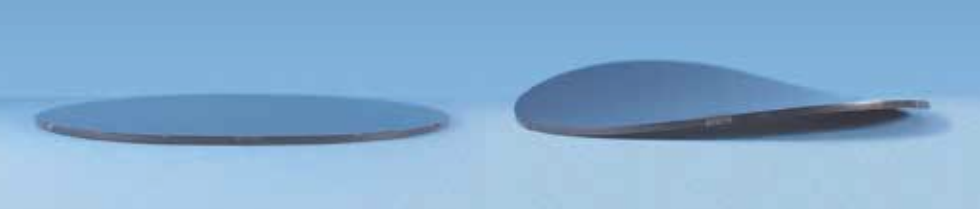
DURABIO **XANTAR K series**

DURABIO has excellent weather resistance, a good balance of scratch resistance, impact resistance, and chemical resistance, as well as colorability and mold transferability, enabling coating-free and coating-less parts.



NOVADURAN
LX series
(Glass fiber-reinforced)

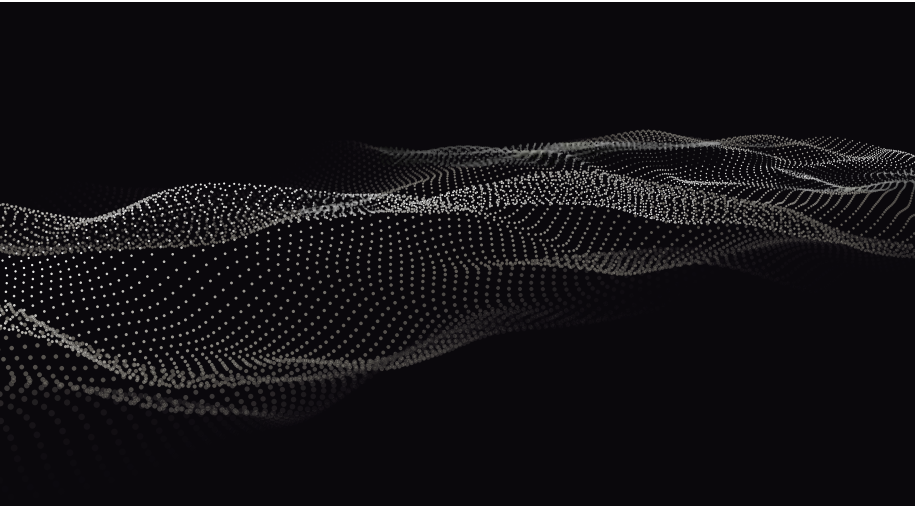
General PBT resin
(Glass fiber-reinforced)



Ultra low warpage PBT resin

NOVADURAN LX series

This is a differentiated grade that significantly improves warpage, which has long been an issue with fiber-reinforced PBT resins. It has lower warpage than conventional low warpage grades, making it possible to obtain molded products with high dimensional accuracy, even for large products. It also has low specific gravity, which contributes to weight reduction of parts.



Electromagnetic wave absorbing PBT resin

NOVADURAN RA series

It is a PBT resin with electromagnetic wave absorption performance. While absorbing electromagnetic waves with high efficiency, it also suppresses reflected electromagnetic waves, which can be a noise factor. It is applicable to a wide range of frequencies from quasi-millimeter wave to millimeter wave bands.

“Engineering plastics that float on water” ultra-lightweight, foamable PBT resin

NOVADURAN ZR series

This is a unique grade with foaming properties added to the material itself through a combination of proprietary formulation and manufacturing technologies. No special molding machine or pre-mixing of foaming agent is required, and it is possible to obtain ultra-lightweight molded products with specific gravity of less than 1.0 easily while maintaining the high rigidity of fiber-reinforced systems.



LDS (Laser Directed Structuring) XANTAR LDS series NOVADURAN LDS series

With the support of LPKF's LDS technology, by forming circuits directly on the molded product, it becomes possible to execute efficient circuit and product design, even for complex shapes such as curved surfaces. This technology is particularly suitable for antenna components and is expected to simplify the manufacturing process by integrating the housing and antenna components.

Environmental Initiatives

PFAS-Free flame retardant resin

XANTAR XF series
NOVADURAN SEF series
DURABIO

Various grades with high flame retardancy without containing PFAS* are available.

* PFAS is a generic term for organic fluorine compounds. It is difficult to decompose in the natural world and accumulates in water, etc., and has been pointed out to be toxic to humans.



Biomass

DURABIO

DURABIO, a plant-derived biomass engineering plastic, is a material that fixes carbon dioxide in the atmosphere during the growing process, and is expected to contribute to carbon neutrality. We have also released a new series with a biomass degree of 74%.



Recycled material

NOVADURAN CE series
XANTAR KE series, ECO series

Containing up to 60% recycled raw materials recovered from the market, XANTAR CE series and NOVADURAN CE series are "environmental friendly" engineering plastic materials that can contribute not only to the reduction of waste but also to the reduction of CFP. XANTAR KE series also offer transparent grades.

* CFP is a system for converting greenhouse gas emissions throughout the entire life cycle of products and services, from procurement of raw materials to disposal and recycling, into CO₂ emissions and displaying the amount of emissions.



Recycled carbon fiber reinforced grades

While carbon fiber has excellent specific rigidity and is a highly effective weight-reducing reinforcing agent, it also emits large amounts of CO₂ during production, and materials using carbon fiber have a high environmental impact.

Mitsubishi Chemical offers a lineup of grades using carbon fiber obtained by sintering CFRP waste (recycled carbon fiber), which reduces both weight and CO₂ emissions.

Polycarbonate (PC) chemical recycling

We have developed a new depolymerization technology based on monomer synthesis and polymerization technologies accumulated over many years. Chemical recycling technology makes it possible to obtain high-quality recycled PC from wasted PC.



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PHL & PC Department
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Information on
XANTAR, NOVADURAN



Information on
DURABIO