Maezio®

CONTINUOUS FIBER-REINFORCED THERMOPLASTIC COMPOSITES

"tune the world" with Maezio®
thermoplastic composite solutions
from Covestro.

People need lighter & thinner products.

Industries require materials that push the boundaries of what is possible to make their needs a reality.

We believe Maezio® Continuous Fiber-Reinforced Thermoplastic (CFRTP) composites are the solution.

Designed for performance as well as scale.

Unfortunately, many of today's advanced materials are built for limited runs and large size, making them too expensive to scale. For expensive race cars or giant wind blades they're great.

However, for millions of devices and cars, you will need a new solution.

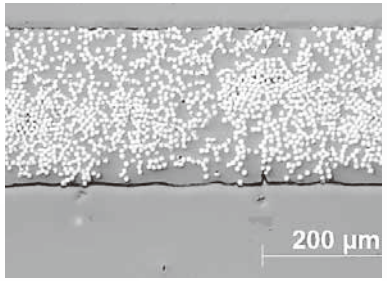
Maezio®

Maezio® composite solutions from Covestro allow you to tune the world, customizing the material to your specific needs.

We combine strong fibers with the power and flexibility of thermoplastics.

The results are composite uni-directional (UD) tapes that are nearly 120 micron thin, and can be laminated together at different angles to form sheets tuned to a specific performance. The resulting sheets are strong, stiff, lightweight and have an amazing surface finish.

Cross Section Maezio® Thermoplastic Composite UD Tape



We combine tapes at different angles to tune sheets for a specific mechanical performance.

These sheets look and sound like metal – but they have all the flexibility of a thermoplastic.

How does Maezio® tune thermoplastic composites?

When you need an amazing solution that fulfills your mechanical & aesthetic requirements.

We work with you to make it happen.

WE TUNE FOR NEEDS

We understand mechanical & aesthetic needs. Do you need a particular strength or stiffness, or perhaps you have an existing material that you're trying to replace? Are you trying to emboss a logo or create a particular look & feel?

We work with you to get clarity on what you need.

WE TUNE FOR REQUIREMENTS

We discuss with you the production chain on which your part will be produced.

Do you have a variety of molders that work with you, with different tool setups?

Do you potentially need more efficient manufacturing solutions?

Together with our partners we can help understand what the challenges are and find solutions for them.

WE TUNE FOR SPECIFICATIONS

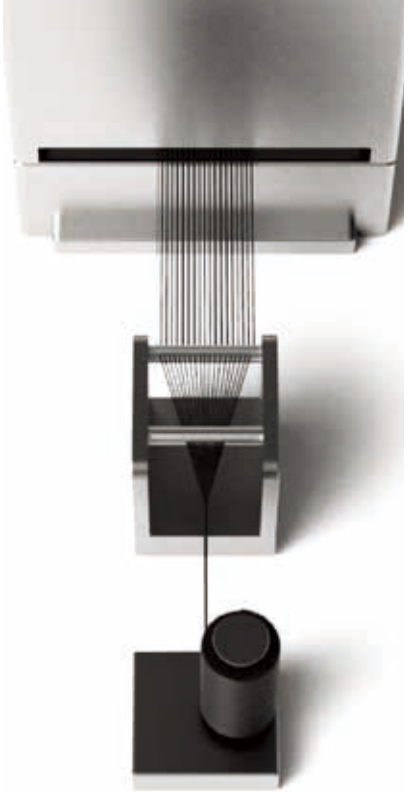
We tune a sheet or tape to your specifications. By simulating different layer structures we work out what mechanical properties will best suit your requirements. We primarily work with carbon fiber and polycarbonate, but also have options with other fibers and other thermoplastic matrix materials.

Because we know polycarbonate well, we make sure that the polycarbonate in our continuous fiber composite materials is compatible and meets the needs of your industry.

WE TUNE FOR YIELD

We test extensively. Working with you and your production value chain we sample and tune physical product to make sure you get the best possible yield rate at the lowest cycle time.

Our processing experts globally are available to do on-site trials. We work with flexural testing and other standard tests to ensure that the mechanical properties of the physical part meets your requirements.



WE TUNE FOR SUPPLY

When you go into production you need to be sure that you have consistent supply.

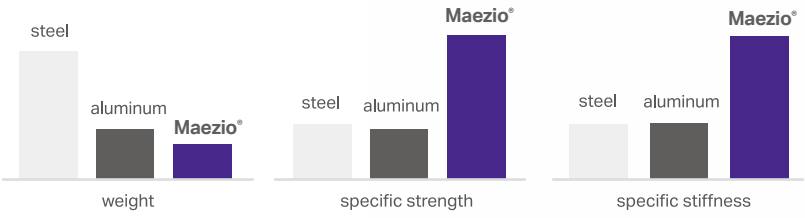
Our uni-directional (UD) tape production capabilities in the south of Germany are some of the largest in the carbon fiber processing world and we're continuing to expand.

That means you can go into large-series production with peace of mind.

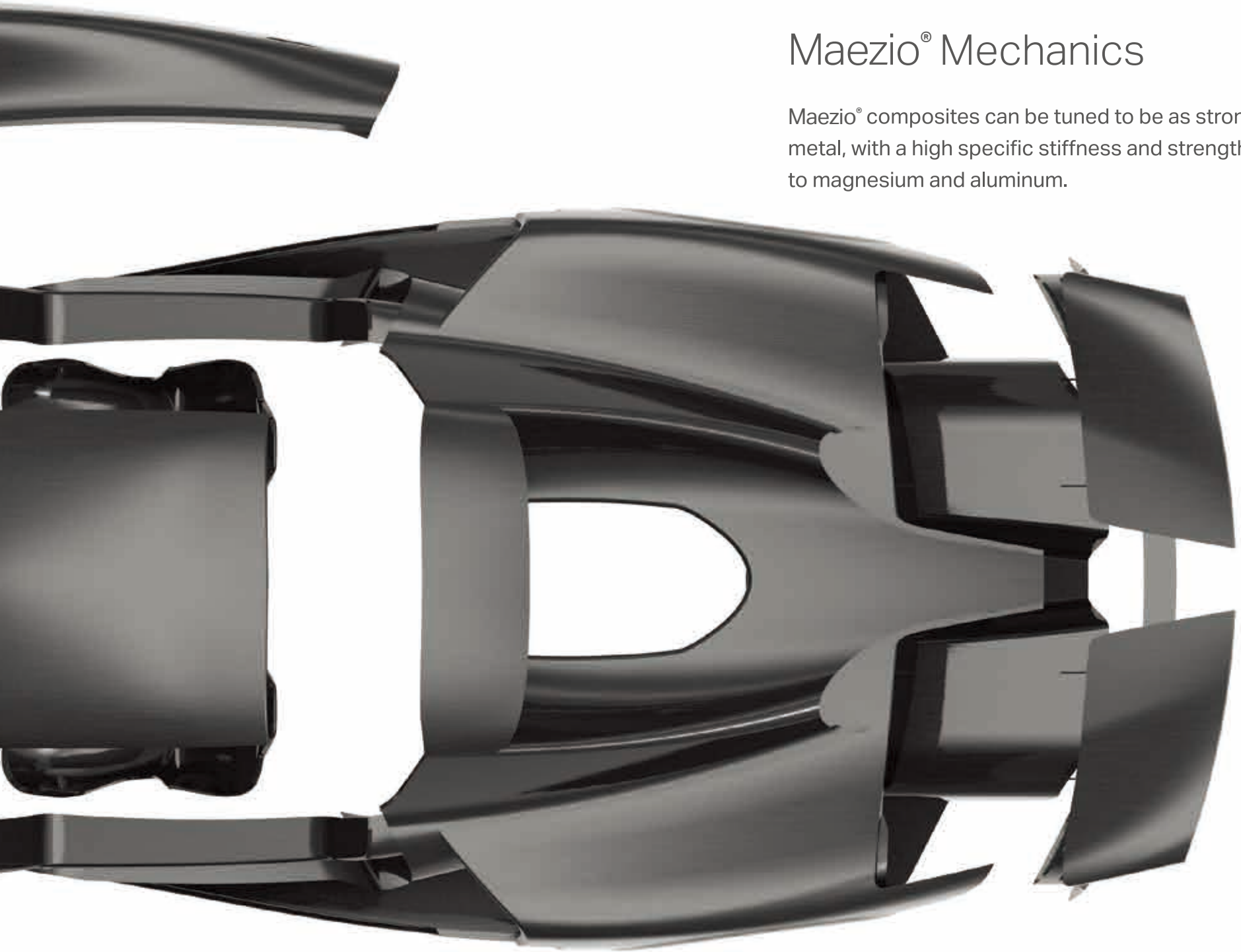
Maezio® UD Tapes & Sheets from Covestro give Industries the material tools to push boundaries.

Properties	Maezio® Composite Carbon Fiber	Magnesium Alloy Aluminum
Specific Stiffness	+++	+
Specific Strength	+++	+
Warpage Resistance	++	+++
Light Weight	+++	+
Fatigue Strength	+++	+
Corrosion Resistant	++	-
Transparent to X-Rays	+++	-
Fire Resistant	++	+++

Property comparison of metals and CFRTP composites.



Fundamentals of Composites Manufacturing: Materials, Methods, and Applications

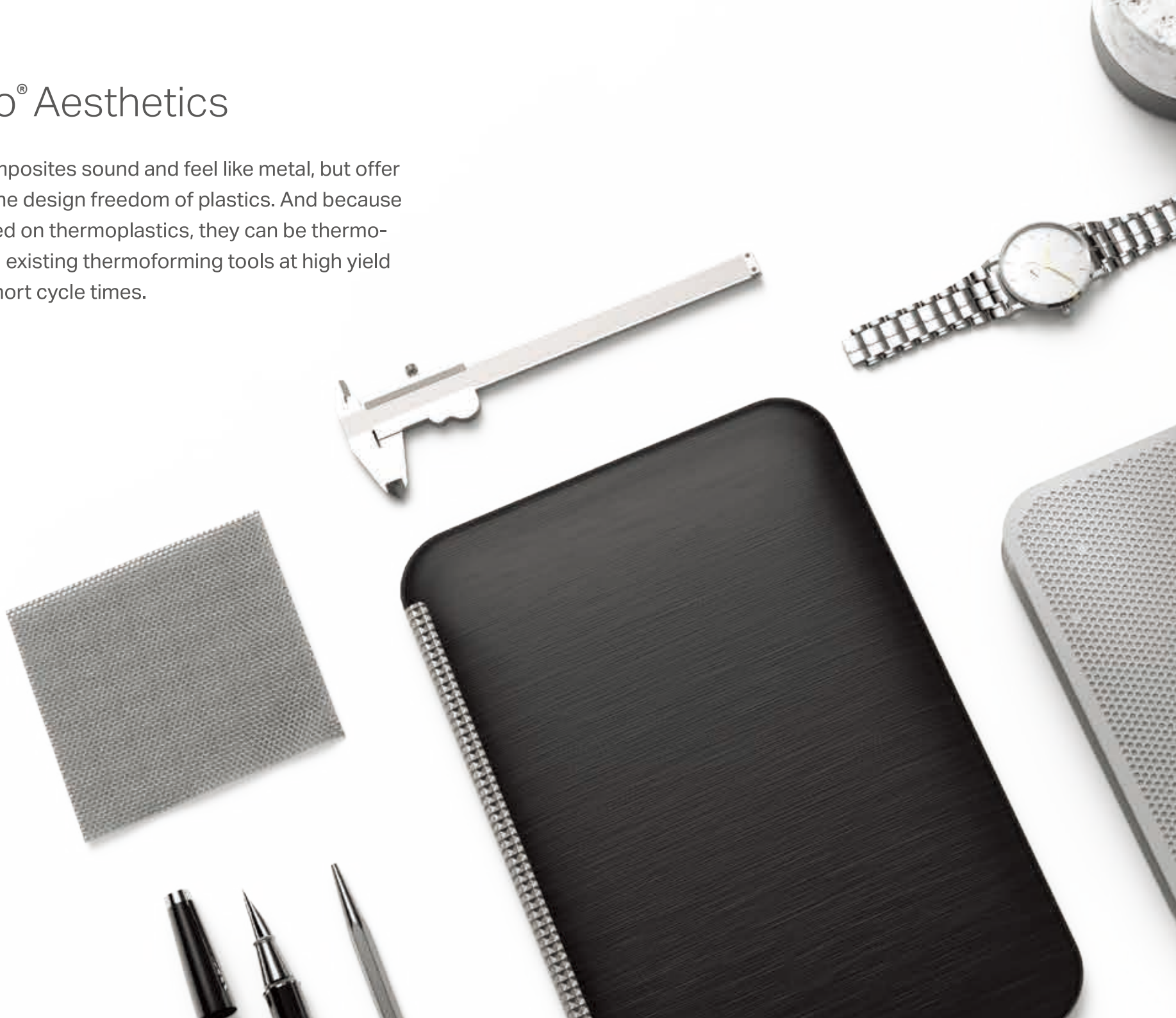


Maezio® Mechanics

Maezio® composites can be tuned to be as strong as metal, with a high specific stiffness and strength compared to magnesium and aluminum.

Maezio® Aesthetics

Maezio® composites sound and feel like metal, but offer designers the design freedom of plastics. And because they're based on thermoplastics, they can be thermo-formed with existing thermoforming tools at high yield rates and short cycle times.



Maezio® Surfaces

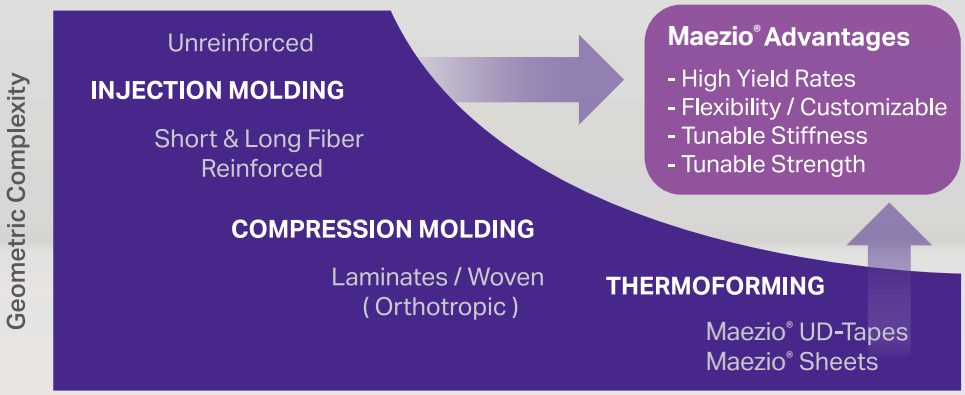
Maezio® tapes & sheets look amazing right off the production line but they can also be coated, embossed and even laser etched to create beautiful surfaces.

Maezio® Scalability & Versatility

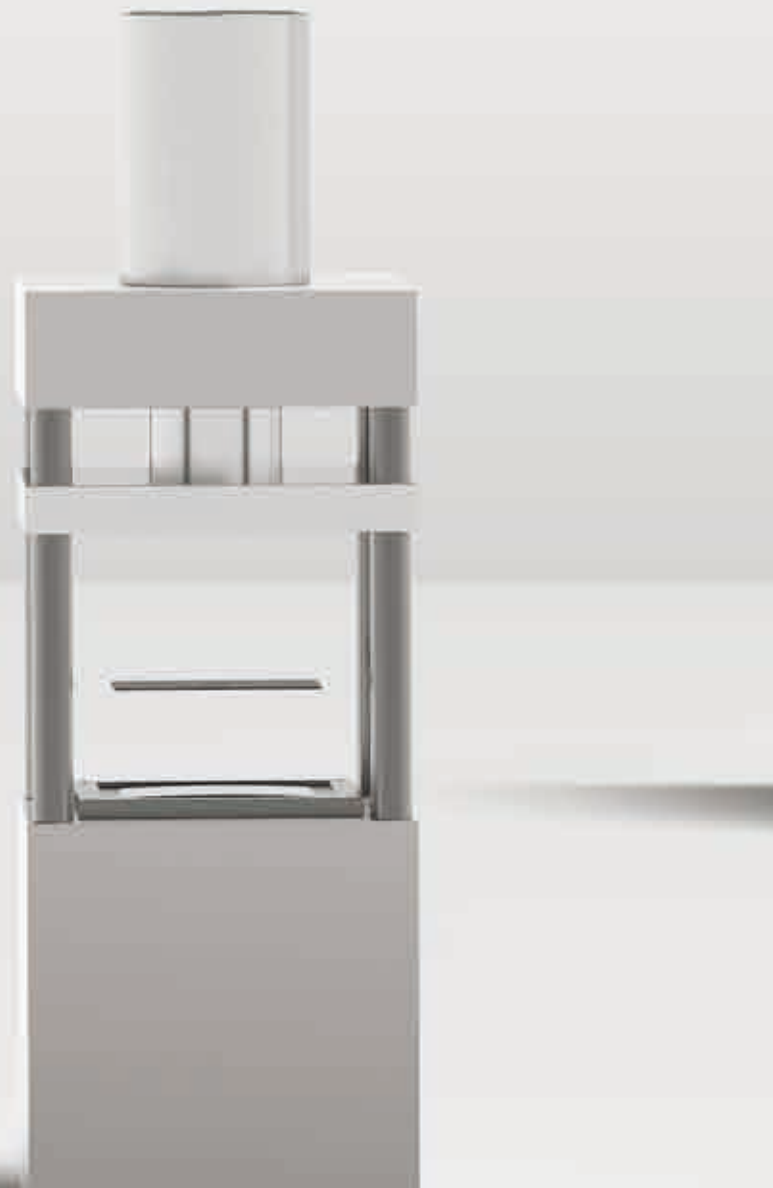
To make continuous fiber composite materials a realistic solution for large-volume applications, processing costs need to come down.

By design, Maezio® thermoplastic composite solutions can be used with high yield rates and low cycle times. When making up to millions of parts per year this is vital.

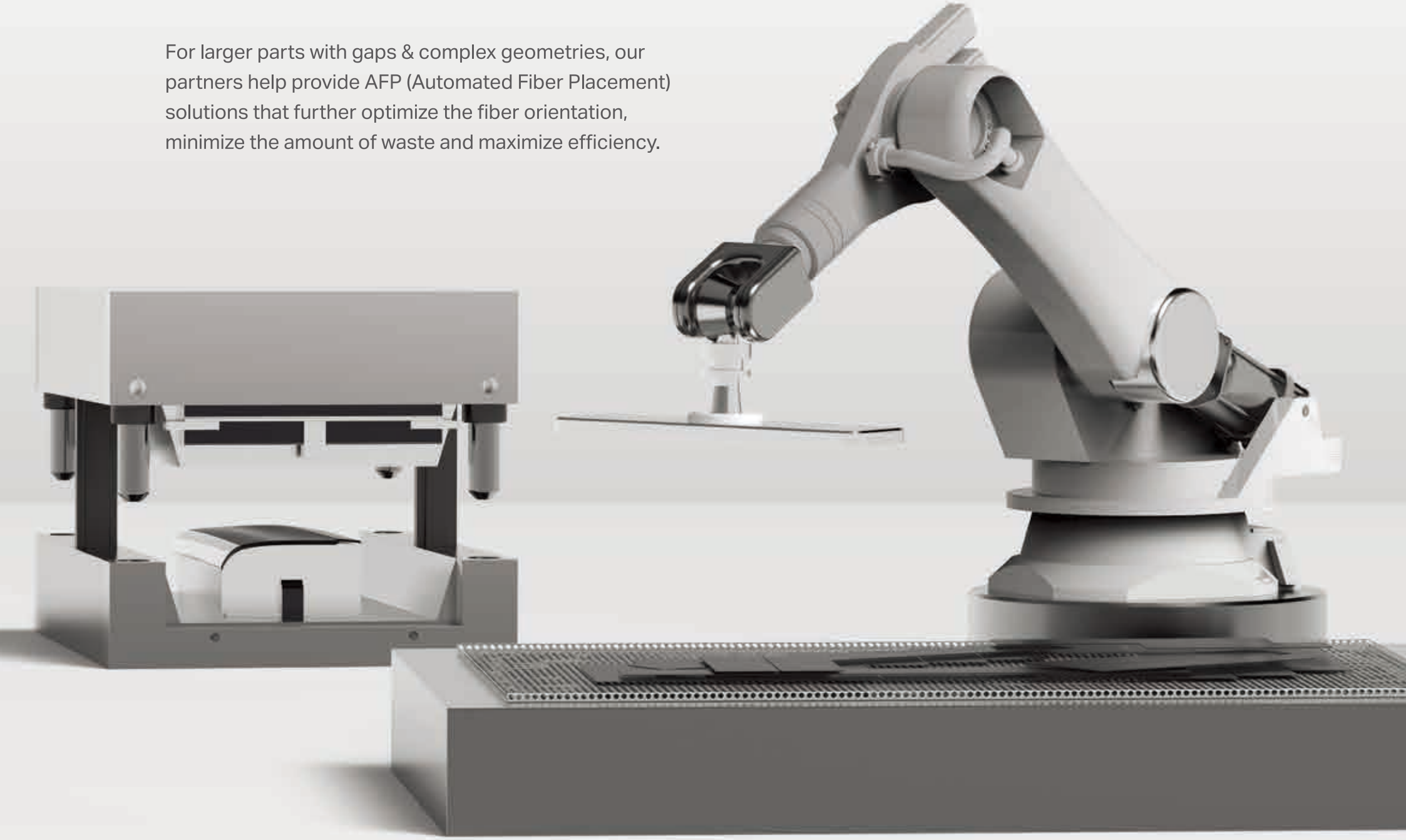
Process & Performance Advantages of Maezio® Composites



Existing thermoplastic injection molding production lines can be easily modified to use thermoplastic composite sheets, and back-molding technologies allow the introduction of hooks, bosses and other features.



For larger parts with gaps & complex geometries, our partners help provide AFP (Automated Fiber Placement) solutions that further optimize the fiber orientation, minimize the amount of waste and maximize efficiency.



Maezio® Thermoplastic Composites Portfolio From Covestro

Our expertise and existing portfolio of thermoplastics, in particular PC & TPU, provides a broad portfolio of resin options. Together with carbon & glass fiber, woven fabrics and polycarbonate films, our composite solutions portfolio addresses a wide range of industry needs.

Thermoplastic Resins

Makrolon®

Bayblend®

Makroblend®

Apec®

Desmopan®

Others

High Performance Fibers

Carbon Fiber

Glass Fiber

Tape & Sheet Products

Maezio® UD Tapes

Maezio® Sheets

Tuned to Specific Stiffness & Specific Thickness

® = trademark of Covestro Group, at least registered in the European Union

Thermoplastic Composites Comparison

As compared to other materials in its class,
Maezio™ thermoplastic composites hold their own mechanically
while having clear processing advantages.

Results & Comparisons

	Maezio® Composites Carbon Fiber	Thermoset Composites Carbon Fiber	Magnesuim & Aluminum Alloy	Aluminum CNC
Processing Temperature	Medium	Low	Very High	Low
Shelf-life	Long (store at room temp.)	Short (store at low temp.)	Long (store at room temp.)	Long (store at room temp.)
Recyclability	Recyclable	Difficult	Recyclable	Recyclable
Cycle Time	Short	Long	Normal	Very Long
Density (g/cm^3)	1.5	1.5	1.8	2.7
Total cost of finished parts	Low	High	Medium	Very High
Surface	'A class' achievable	'A class' proven	'A class' achievable	'A class' proven

When bringing new materials into new markets you can't go at it alone.

Covestro believes in collaborating with an ecosystem of partners and experts. Together, we push boundaries to enable Maezio® thermoplastic composite solutions to deliver against specific industry requirements and your specific needs.

RAW MATERIALS

Fiber suppliers, new resins and sizing technologies are just some of the raw material partnerships that we're engaging in.

OEMS & MARKET NEEDS

When these partnerships come together it means greater insights and capability in meeting market needs.

PRODUCTION

We partner with process technology companies to help value chains process thermoplastic composites into amazing products.

UNIVERSITIES & NETWORKS

Thermoplastic composites being a relatively young field, a lot of innovation is coming out of research networks & universities and we work hard to bring these to market.

Let's "tune the world" together

Maezio® Thermoplastic Composites from Covestro are pushing the boundaries across industries. We are delivering a combination of light weight, specific strengths and finishes at a scale unreachable by advanced materials today.

We look forward to collaborating with you to understand where and how our composites solutions can generate the results you need.

For additional information on Maezio® thermoplastic composites please scan the CODE or send us a note.

Email: maezio@covestro.com
Website: www.maezio.covestro.com

Covestro is a world-leading supplier of high-tech polymer materials. Our products & solutions are used in many areas of modern life. Our vision "to make the world a brighter place" leads us to push the boundaries of what is possible, making cars lighter to save fuel, insulating buildings for reduced energy consumption and enabling safe, functional and sleek electronic devices.

Our portfolio includes Polycarbonate; the high performance thermoplastic that is strong, lightweight & durable.

Sustainability

Maezio® thermoplastic composites fit perfectly in the Covestro vision for sustainability. As thermoplastics, at the end of their life, they can be reground and used in an injection molding process for chopped fiber composite materials. Beyond reuse in injection molding, advanced solutions, such as cost-effective fiber extraction also exist.

As part of our sustainability philosophy we're actively looking for new business models in this space.

Maezio®

THERMOPLASTIC COMPOSITE SOLUTIONS
FOR NEXT GENERATION APPLICATIONS, TODAY.

LET'S "TUNE THE WORLD" TOGETHER

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The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), includ ing any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance, information and recommendations to determine to your own satisfaction whether our products, technical assistance and information are suitable for your intended uses and applications. This applicationspecific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by Covestro. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale which are available upon request. Products which are not designated for the manufacture of a medical device or food contact must not be used for such applications without Covestro ' s prior consent. Nonetheless, any determination as to whether a product is appropriate for use in a medical device or for food contact products must be made solely by the purchaser of the product without relying upon any representations by Covestro.

With respect to health, safety and environment precautions, the relevant Material Safety Data Sheets (MSDS) and product labels must be observed prior to working with our products.

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