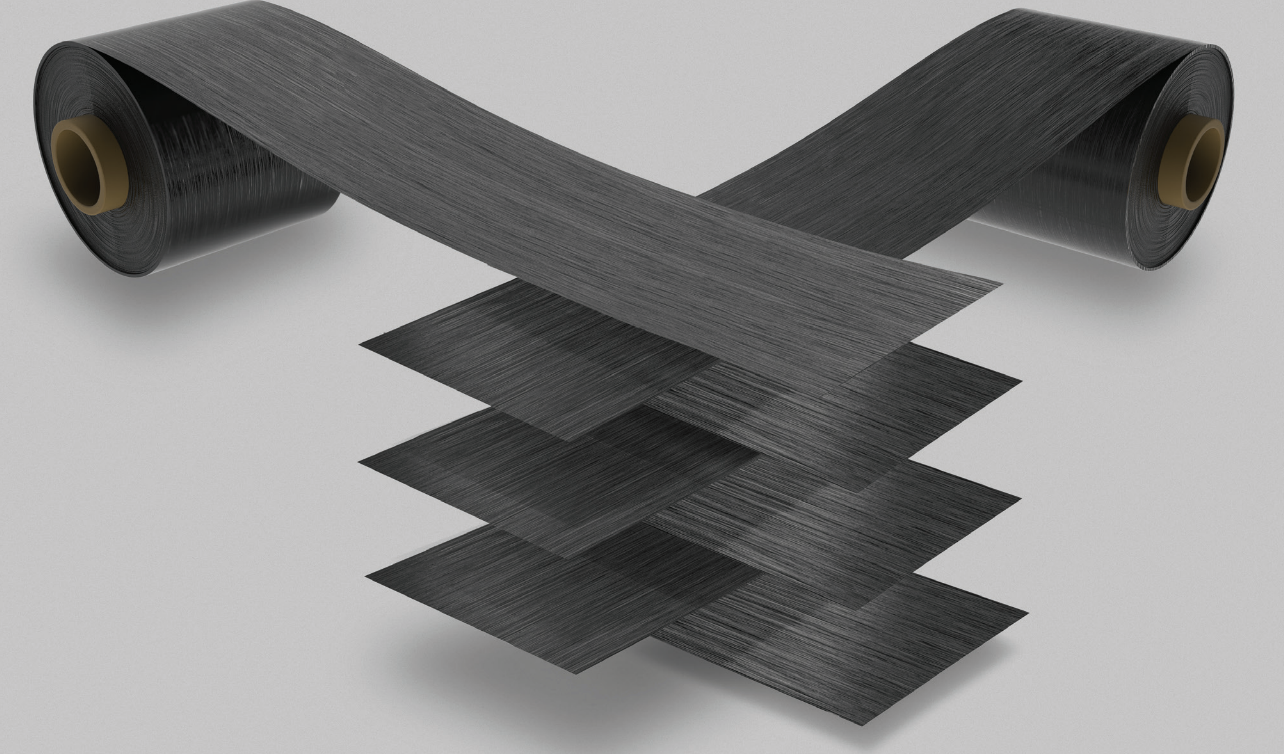
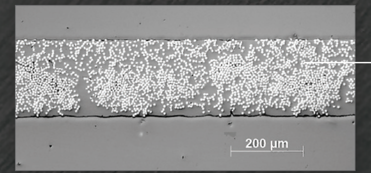


A new type of infinitely tunable composite material

Maezio™ continuous fiber-reinforced thermoplastic (CFRTP) composites from Covestro are based on the combined strength of reinforcing fibers and the manufacturing flexibility and performance of thermoplastic resin.

The result is nearly 120 microns thin and lightweight unidirectional (UD) tape, meaning that the long strands of fiber are oriented and providing strength in the lengthwise direction of the tape. In laminating several layers of tape together at different angles, it is possible to produce thin, stiff and lightweight sheets with mechanical strength that can be tuned to your specific application.

Our primary materials are carbon fiber and polycarbonate, but we can also provide composite solutions that use other fibers and thermoplastic resins. With our production base in the south of Germany, we can provide consistent, high-volume supply for our customers.



UD tape cross section
Each tape layer is about 120 microns thin, and the fiber and resin type can be specified to fulfill customers' needs and requirements

UD tape lamination
The direction of the fiber in each layer of the tape lamination stack can be tailored to specific applications

Sheet-based thermal compression molding

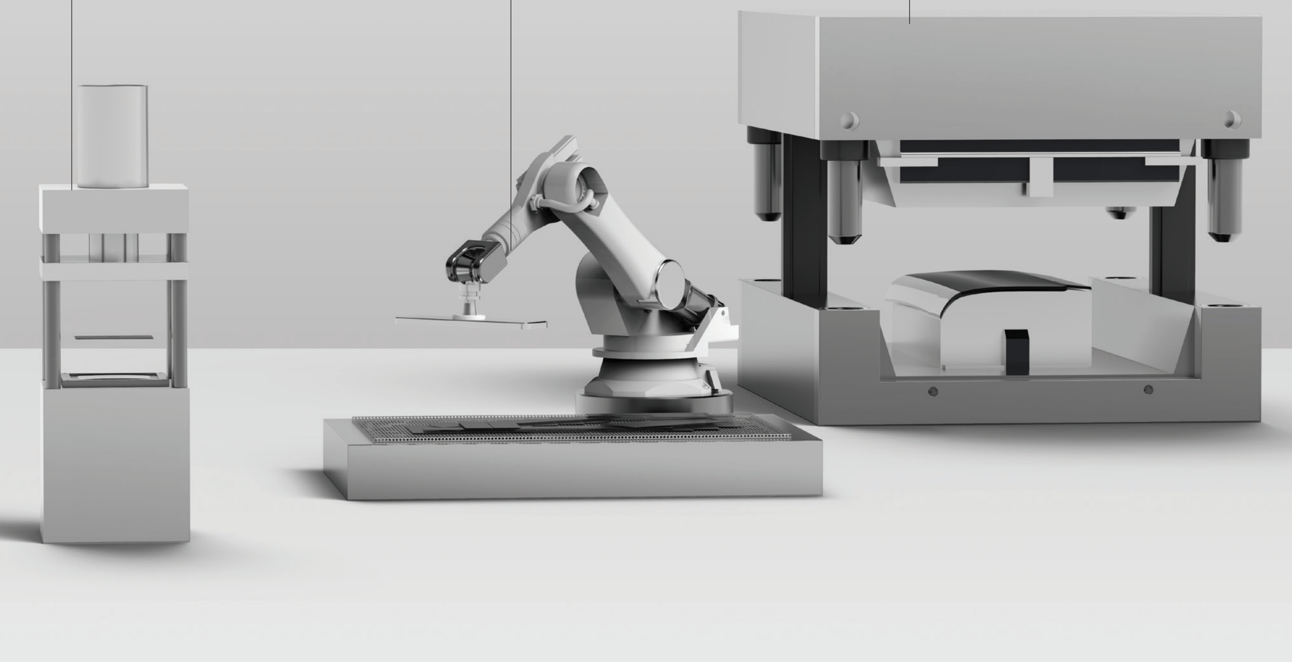
A pre-formed sheet is placed inside a thermal compression molding tool for forming. The number of layers and individual layer fiber orientation of Maezio™ sheets can be tailored to meet specific application requirements on a case-by-case basis. Additional part features like hooks, ribs and bosses, as well as some finishes such as IMD films and in-mold textures can be added during thermal compression molding.

Tape-based thermal compression molding, step 1

Robots lay out lengths of Maezio™ tape with high precision. This makes it possible to add multiple layers at custom angles where strength is most needed, without unnecessarily increasing part thickness or weight.

Tape-based thermal compression molding, step 2

The tape stack is transferred onto a thermal compression tool, heated up, trimmed and formed in a single step. Additional part features like hooks, ribs and bosses, as well as some finishes such as IMD films and in-mold textures can be added at this stage.



Unprecedented ease of forming

For large, deep-draw shapes such as car body panels, other transport applications and furniture, we recommend a tape-based approach to forming that starts with laying out layers of tape using an automated robotic layup process. The tape stack is then transferred into a large-scale thermal compression molding tool where the part is formed and additional features such as ribs, hooks and bosses can be added through overmolding, as needed.

For smaller parts, we recommend starting with pre-formed Maezio™ composite sheets that can be tailor-made in terms of number of tape layers and fiber orientation. These sheets can then be formed in conventional thermal compression molding machines, again making it easy to integrate additional features such as ribs, hooks and bosses during the forming process.

In terms of forming and in relation to comparable materials, carbon fiber-based Maezio™ composites offer an extremely attractive mix of short cycle times and high yield rates at low cost.

	Maezio™ Composites, Carbon Fiber	Thermoset Composites, Carbon Fiber	Die-cast Magnesium & Aluminum Alloys	CNC Aluminum
Forming temperature	Medium	Low	Very high	Low
Cycle times	Short	Long	Medium	Very long
Deformation	Medium	Medium	Medium	Low
Surface quality	Class A achievable	Class A proven	Class A achievable	Class A proven
Recyclability	Recyclable	Difficult to recycle	Recyclable	Recyclable
Total cost of finished part	Low	High	Medium	Very high

Fine-tuned for your application

Small, medium or large – it doesn't matter. We can tune our Maezio™ composites to match your application specifications in terms of scale, supply and manufacturing.

We understand that different industries have different requirements and we will use our unparalleled knowledge of fiber-reinforced polycarbonate composites to ensure the highest quality aesthetic solutions, mechanical performance and production yield rates.

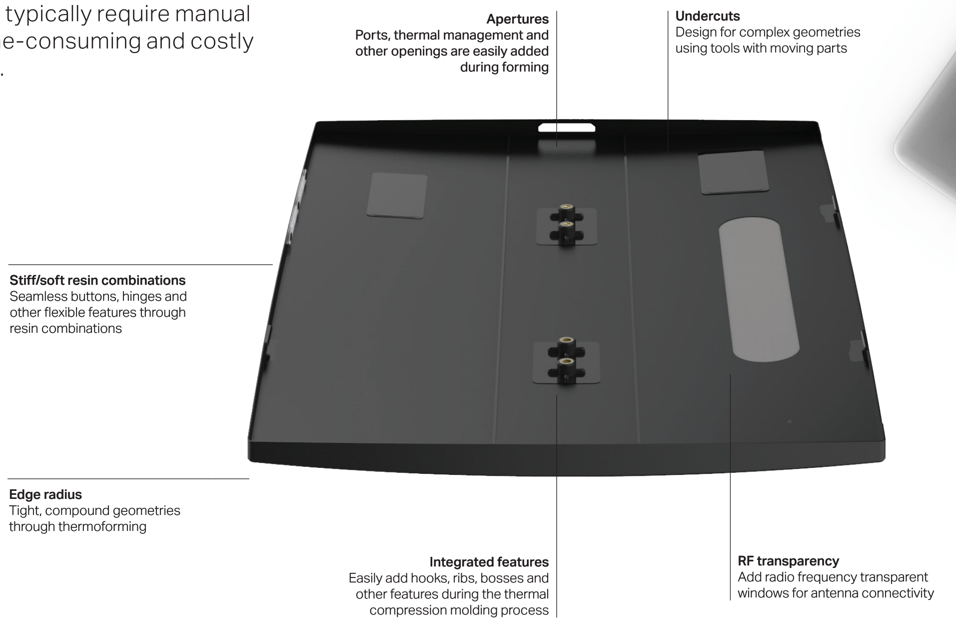
A new premium material for designers

The world of premium materials is typically limited to metals, glass and ceramics, but carbon fiber-based Maezio™ composites bring exciting new design opportunities to the table – the material has the cool touch and reassuring resonance of metals, as well as the pristine surface of glass and ceramics.

However, Maezio™ also brings the flexibility of thermoplastic forming to premium materials, opening the path to completely new applications and user experiences

Flexible integration

Adding product features such as apertures, integrated buttons, ribs, bosses and hooks to Maezio™ parts is easy as it can all be done during the thermal compression molding process, giving considerable flexibility over thermoset composites and metal-forming techniques that typically require manual assembly or time-consuming and costly CNC machining.



Apertures
Ports, thermal management and other openings are easily added during forming

Undercuts
Design for complex geometries using tools with moving parts

Stiff/soft resin combinations
Seamless buttons, hinges and other flexible features through resin combinations

Edge radius
Tight, compound geometries through thermoforming

Integrated features
Easily add hooks, ribs, bosses and other features during the thermal compression molding process

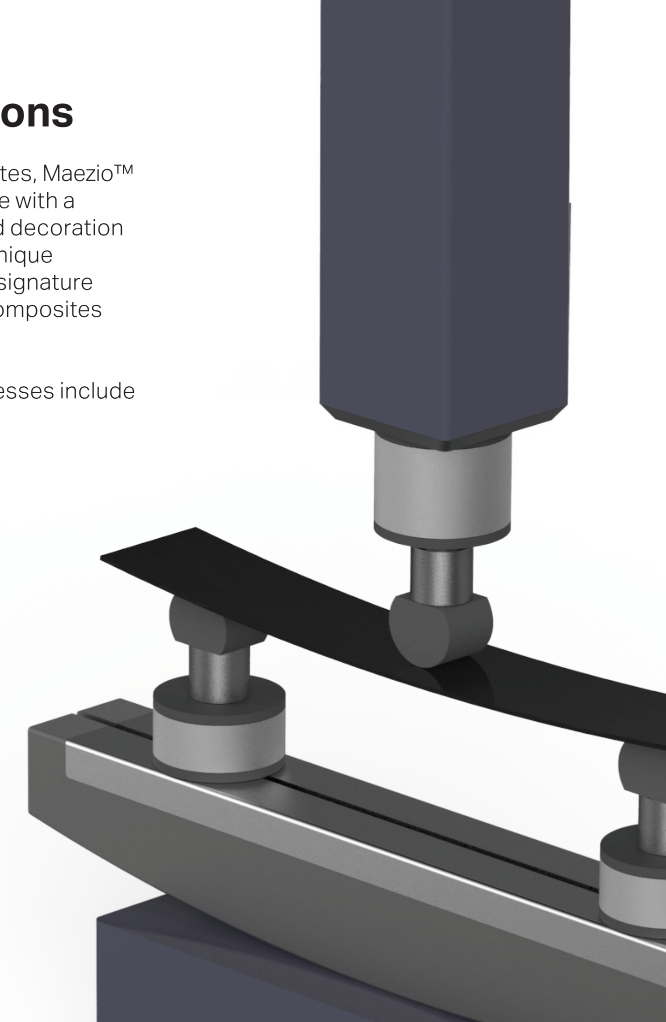
RF transparency
Add radio frequency transparent windows for antenna connectivity

Finishing options

Unlike thermoset composites, Maezio™ composites are compatible with a wide range of coatings and decoration processes for designing unique surfaces, logos and other signature details, making Maezio™composites work for your brand.

Compatible finishing processes include

Fiber color
Resin color
In-mold texture
In-mold decoration film
Painting and coating
Embossing/debossing
Printing
Laser marking



Competitive performance

Benchmarked against other materials in its class, carbon fiber-based Maezio™ composites offer very competitive performance with clear processing advantages over metals and carbon fiber-based thermoset composites. Find out how we can bring light weight, strength and durability to your product.

	Maezio™ Composites	Thermoset Composites	Die-cast Magnesium	CNC Aluminum
Density (g/cm³)	1.5	1.5	1.8	2.7
Specific stiffness	+ + +	+ + +	+	+
Specific strength	+ + +	+ + +	+	+
Light weight	+ + +	+ +	+	–
Fatigue strength	+ + +	+ + +	+	+
Corrosion resistance	+ +	+ +	–	–
Transparent to X-rays	+ + +	+ + +	–	–
Fire resistance	+ +	+	+ + +	+ + +

Let’s tune the world together

We would love to hear from you, please contact us by:

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Maezio™

CONTINUOUS FIBER-REINFORCED THERMOPLASTIC COMPOSITES

“tune the world” with Maezio™
thermoplastic composite solutions
from Covestro.