IMPOSSIBLE OBJECTS

Introductory Presentation for:

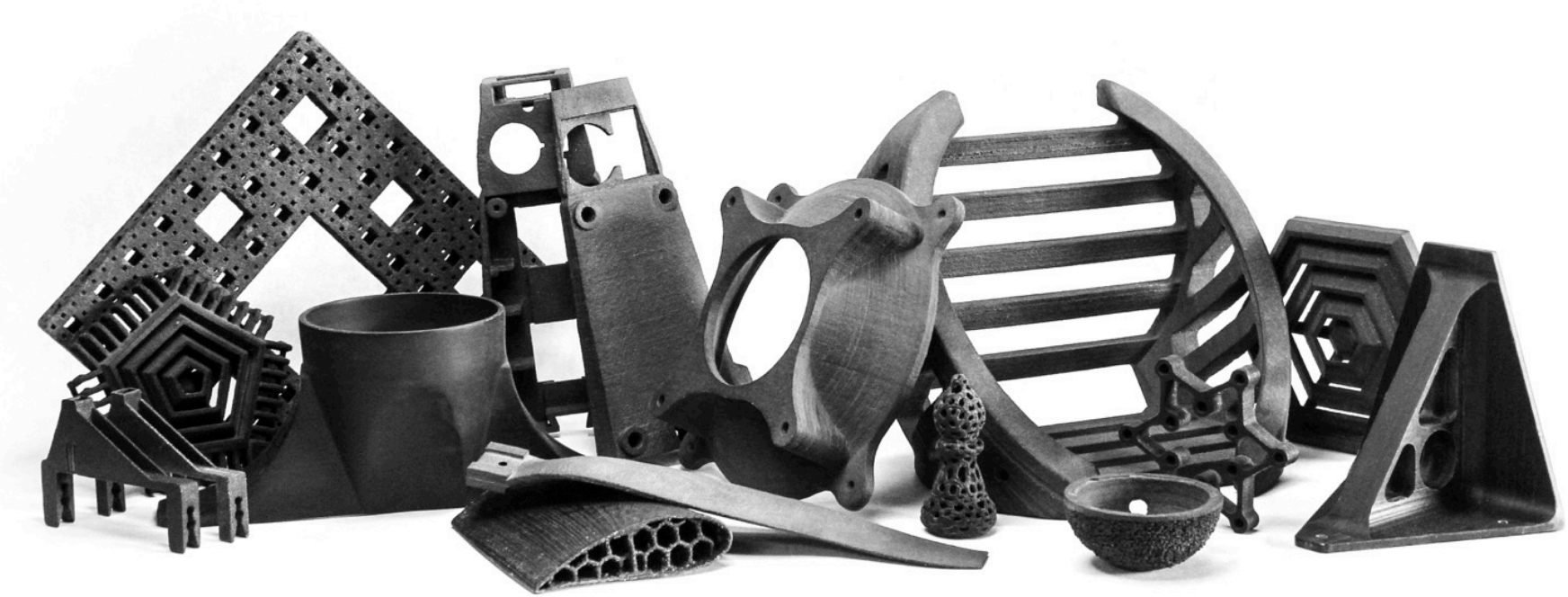
The Institute for iacmi Advanced Composites Manufacturing Innovation

THE COMPOSITES INSTITUTE

February 01, 2017

Industrial Strength Additive Manufacturing

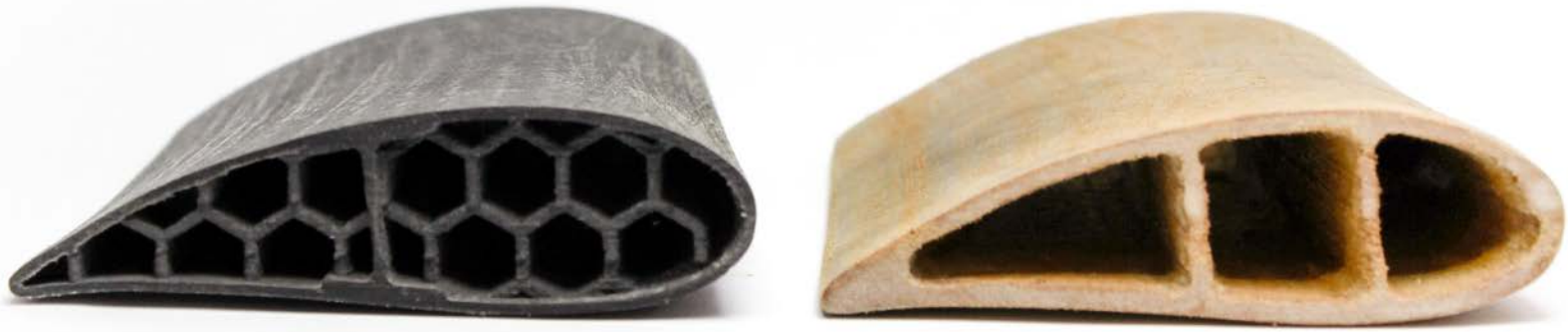
Taking 3D printing from prototyping to high-volume production.



Impossible Objects' CBAM technology

CBAM, or "composite-based additive manufacturing," is based on years of research in materials science.

CBAM processes **fiber fabrics** and **thermoplastic powders** through an inkjet-based system to rapidly form strong 3D parts.



How CBAM works

STEPS ⟶

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Feed fiber sheet into inkjet printer.	Load CAD slices into printer and print layer shape of object on fiber sheet.	Deposit polymer powder onto printed sheet.	Remove dry powder.	Stack sheets in order, heat to melting T° of polymer, and compress stack to final part height.	Remove un-bonded portions of sheet fibers to net final part.
	The print fluid is a wetting agent, not a build material.	The polymer powder sticks to where the sheet is wet (printed.)	Only the powder that stuck to the printed wet shapes stays.		

CBAM Advantages

SPEED

For high-volume production

CBAM can scale to speeds making parts in minutes or seconds.

STRENGTH

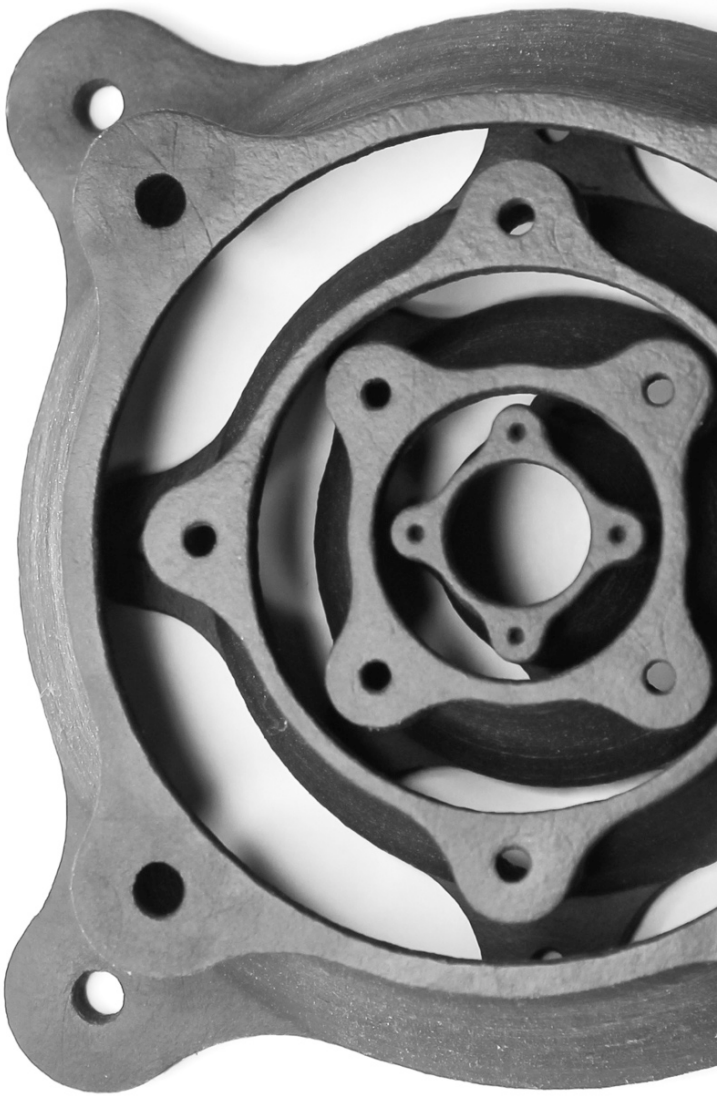
For end-use parts and tooling

CBAM's fiber-reinforced materials are stronger than all other polymer-based 3D printing materials, yet lighter than metals.

MATERIALS

Works with a wide range of materials

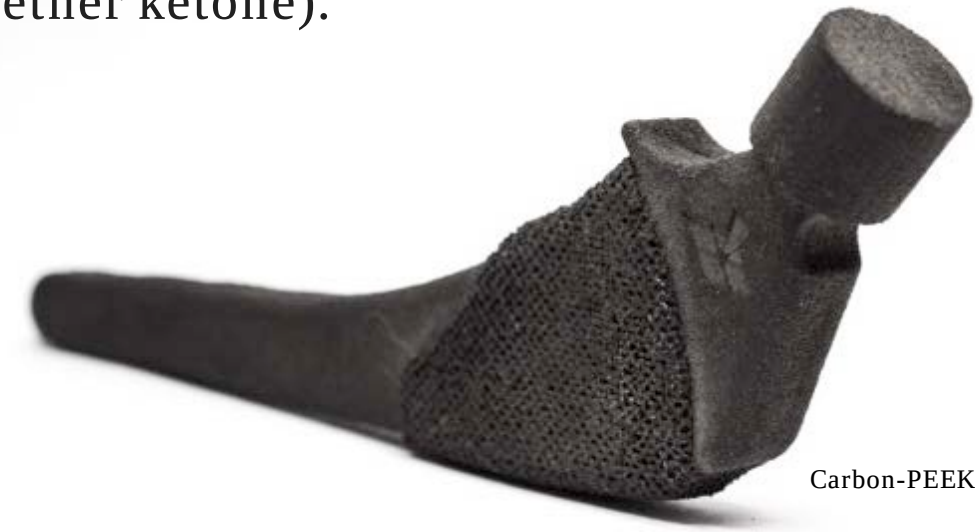
Users can choose and combine different fiber and thermoplastic materials.



CBAM works with a wide range of materials

There are many **fiber fabric** options, including carbon fiber, glass fiber, aramid (Kevlar) fiber and more.

Most **thermoplastic powders** will work, including polyethylenes, polyamides (nylons) and high-performance polymers such as PEEK (polyether ether ketone).



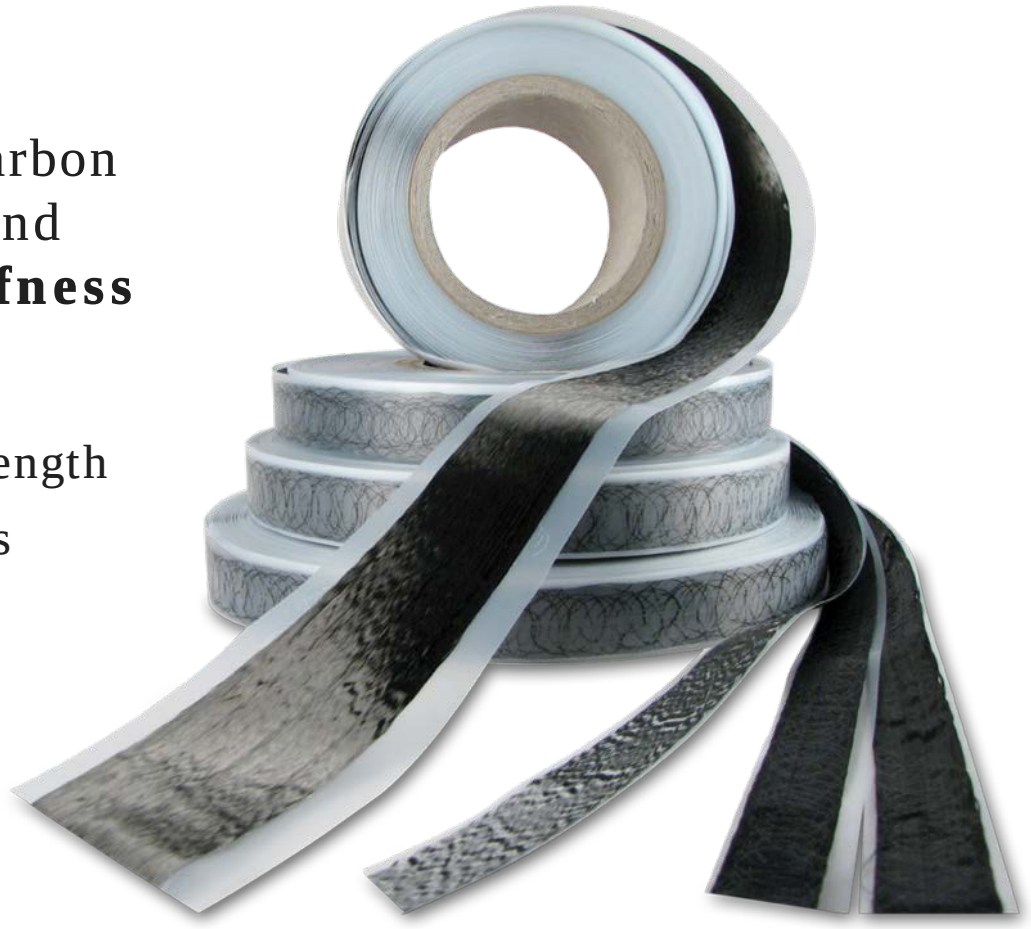
Carbon-PEEK part

CBAM Will Get Even Stronger

UNIDIRECTIONAL

CBAM with unidirectional carbon fiber is under development and increases **strength** and **stiffness** another 3x to 6x.

- 600 to 1,000 MPa tensile strength
- 40 to 60 GPa tensile modulus



CBAM – A step change in additive manufacturing

- Up to 100x faster than the fastest 3D printing technologies.
- Up to 20x stronger than competitive 3D printing materials.
- Widest range of materials.
- Strong, lightweight parts that save energy and reduce environmental impact.
- For high-volume production.

Impossible Objects' CBAM

The **speed**, **strength**, **materials** and team to be the world's leading AM solution for **high-volume** production.