

# MASSIVIT

## 10000 & 10000-G

*OVERCOMING THE BOTTLENECKS OF MOLD PRODUCTION*



# Automate Your Tooling

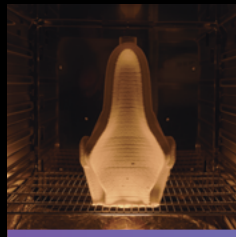
Massivit's Cast In Motion (CIM) technology combines ultra-fast, digital production with industry-proven, thermoset materials co-developed with Sika. The Massivit 10000 empowers manufacturers to automate tooling for composite parts production as well as RIM and Thermoforming. Produce complex, custom molds within a matter of days, instead of weeks!

## From 19 Steps to 4 Steps

The advent of composite materials has brought significant advancements to the manufacturing arena, including markedly improved strength-to-weight ratios. However, the associated tooling processes have – until now – been slow, costly, cumbersome, and wasteful. Tooling workflows have demanded a minimum 19 production steps and are reliant on high-skilled, manual labor.



01. Print



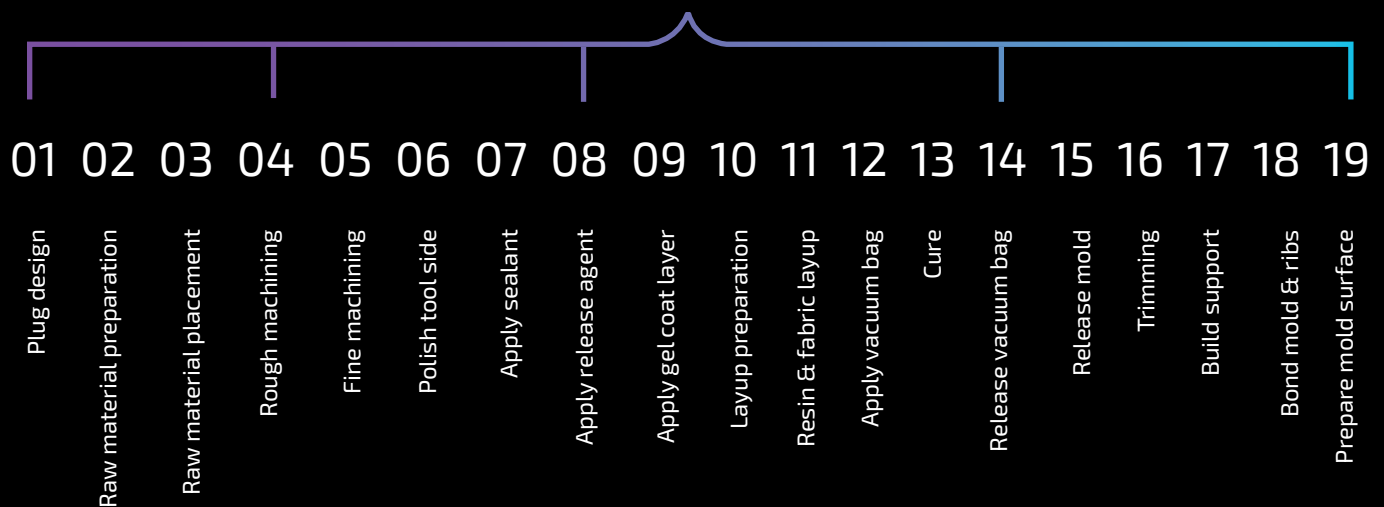
02. Cure



03. Soak



04. Finish



# Key Benefits for Composite Manufacturing

■ **Speed up** mold production time by 80%

■ Reduce **manual labor** by 90%

■ Cut manufacturing **costs by 75%**

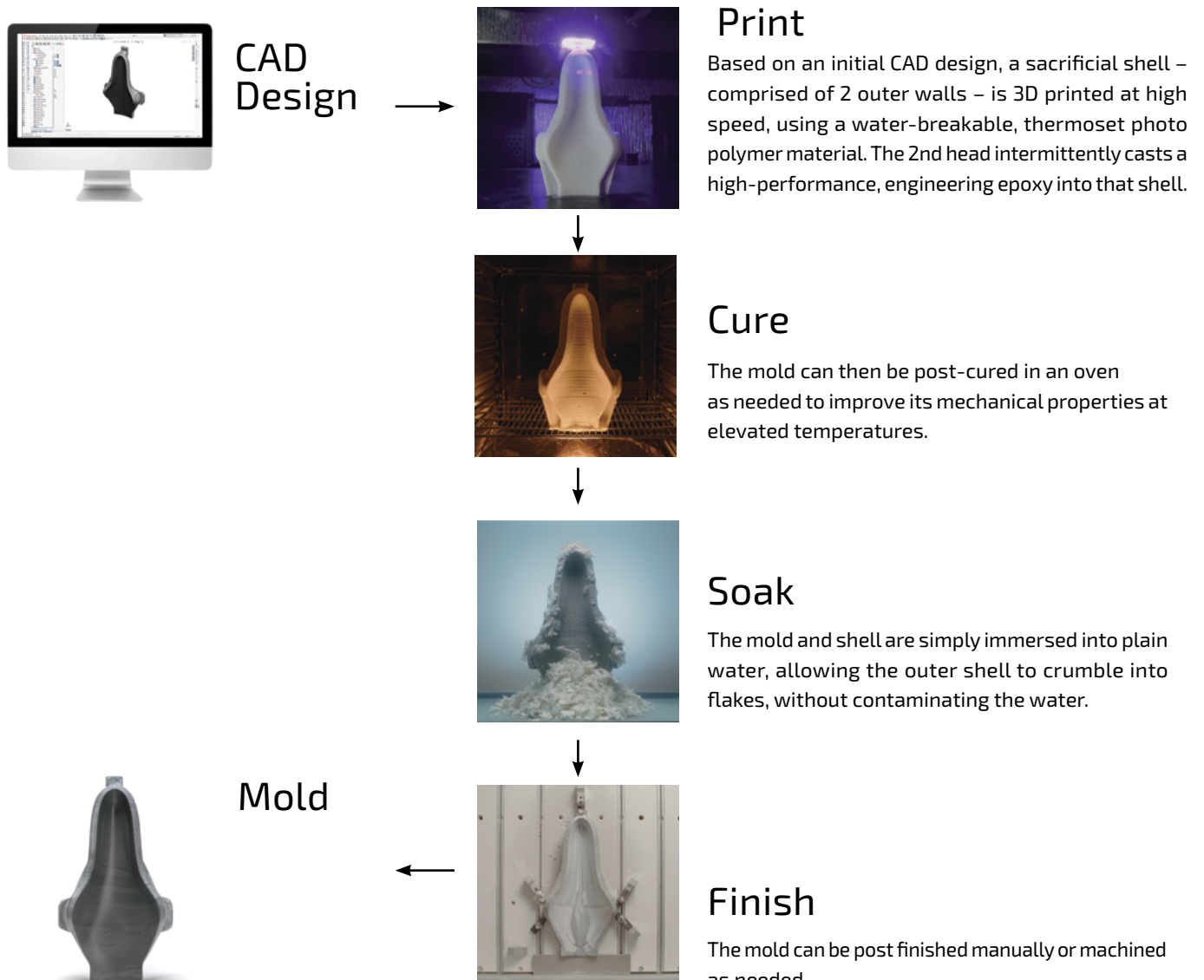
■ **Eliminate** production of a plug or master

■ Produce **isotropic molds** suited to high temperatures

■ Reduce **waste** of expensive materials

■ Benefit from **high mechanical and thermal properties** enabled by advanced thermosets

■ **Unattended shell removal** in which water-breakable material enables the reuse of water





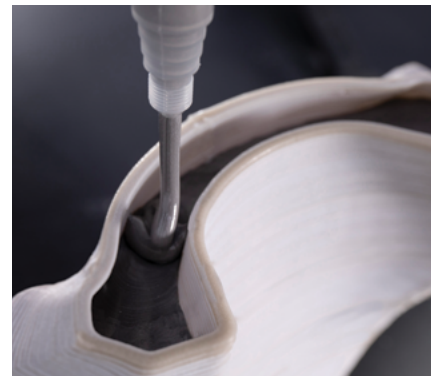
LRTM mold for boat hatch by Marine Concepts



# True Isotropy – Advanced Thermosets Offer Predictability

The Massivit 10000 introduces to market the first true isotropic 3D-printed mold for composite manufacturing.

Unlike other additive manufacturing tooling processes – that may result in uneven molecular bonds due to their layering mechanism – Cast In Motion leverages a thermoset casting material that guarantees consistent mechanical and thermal properties across all axes. In particular, it offers a consistent and low thermal expansion (CTE) at high temperatures. It also provides high thermal stability.



## Thermoplastic AM Extrusion (Filament or Pellets)

Anisotropic

Extruded Bead 4

Extruded Bead 3

Extruded Bead 2

Extruded Bead 1

Time intervals between 3D-printed extrusions result in cooling, causing an inconsistent interface between layers, a recognized weakness.

There are no molecular bonds between layers.

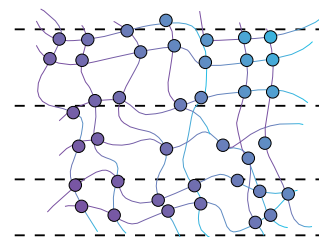
## Massivit's Thermoset Cast In Motion (CIM)

Isotropic

Cast 3

Cast 2

Cast 1



The Massivit 10000 provides a single, uniform cast. This provides fully cross-linked molecular bonds between casting intervals.

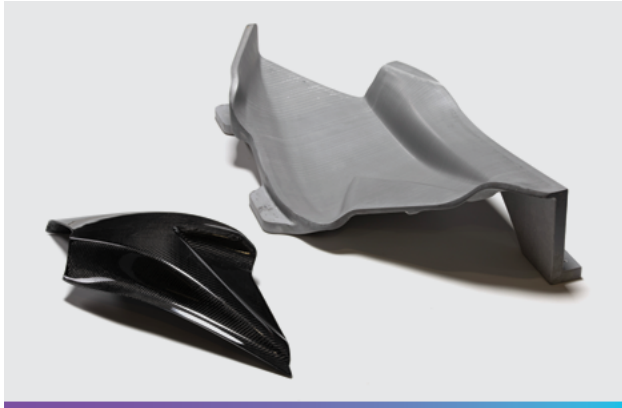
## Eco-Tooling – Reducing Waste

By directly casting the mold, Massivit's additive manufacturing technology minimizes material waste associated with multiple stages of conventional tooling processes.

The Massivit 10000 eliminates extensive handling of materials and stocks, enabling a reduced carbon footprint. It facilitates on-site, on demand manufacturing – thereby decreasing transportation and outsourcing requirements.

# A Range of Applications

Massivit's cutting-edge Cast In Motion technology enables production of direct molds & tooling for a range of applications. It also allows for jigs and fixtures to be produced simultaneously with their associated mold.



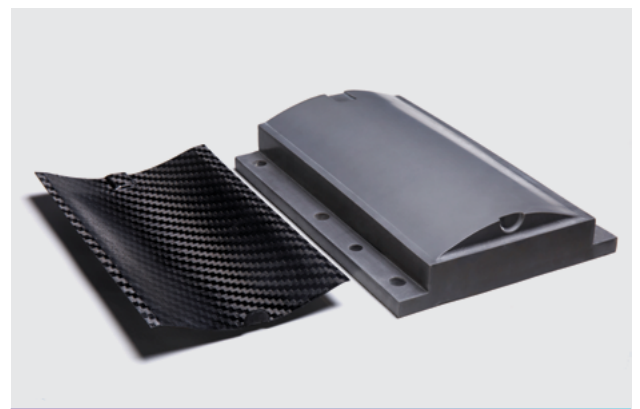
Layup Molds



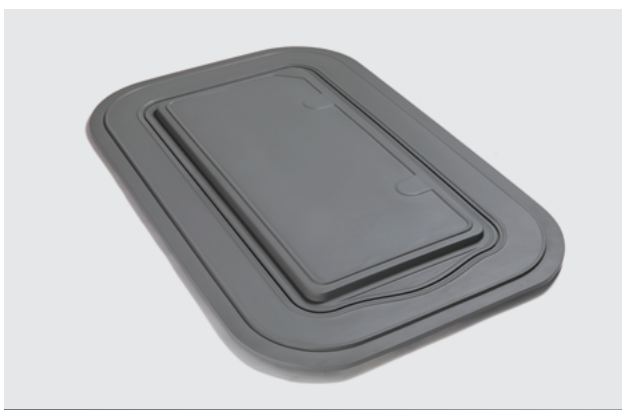
Washable mandrels



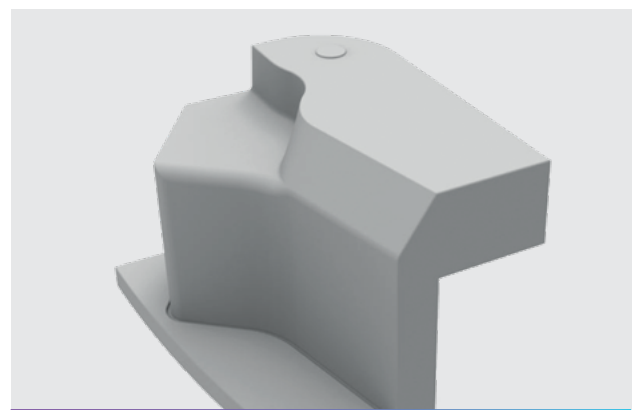
Thermoforming Molds



Molds for Composite Thermoplastics



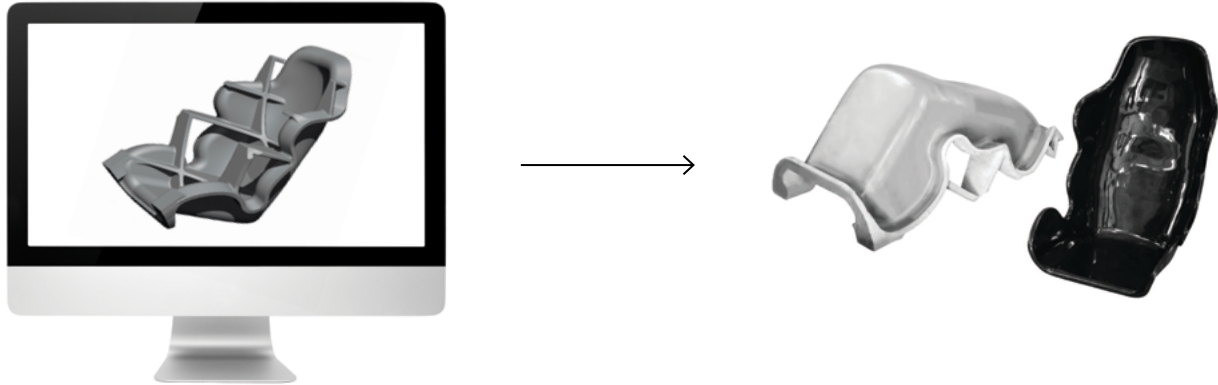
RTM Molds



Master Molds

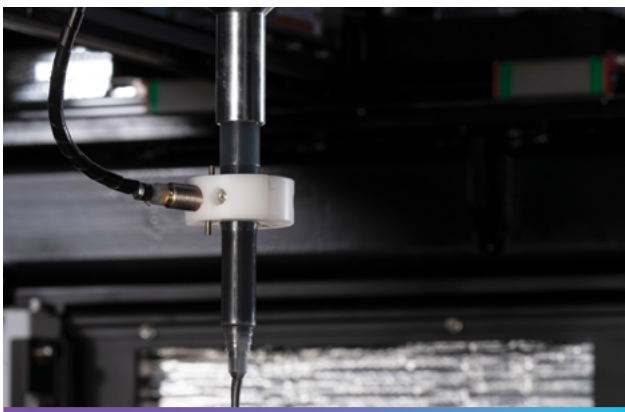
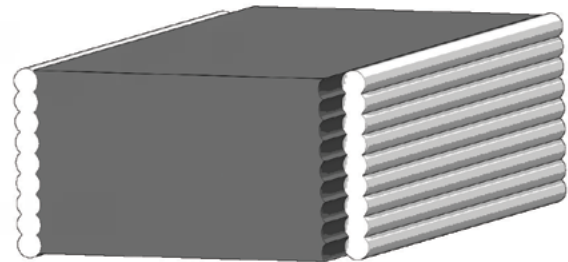
## Freedom of Design

Based on proven additive manufacturing technology already adopted across 40 countries, the Massivit 10000 & 10000-G offer complete design freedom for complex molds. Print your mold in one part & from the same material with its ribbing system.

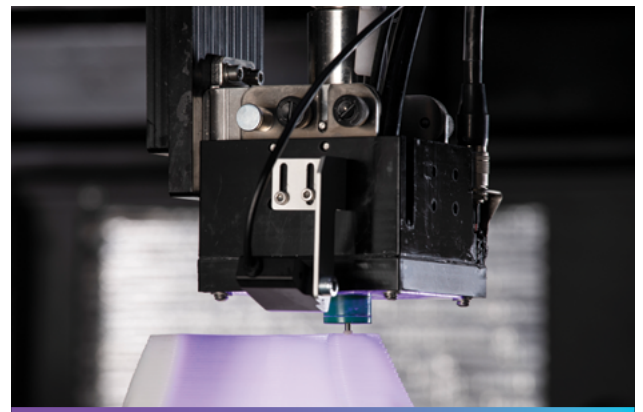


## Freedom of Resolution

The separation between the printed shell and the core breaks the correlation between the shell's layer thickness and the mold's width and strength. This allows the creation of strong, thick, isotropic molds without compromising accuracy.



The casted core of isotropic epoxy can at a width of up to 25 mm / 1 in.



The water-breakable shell can be printed with a 0.5 -1 mm / 0.02-0.04 in. layer thickness.

## 10000-G

The Massivit 10000-G combines Massivit's two key technologies: Cast In Motion (CIM) and Gel Dispensing Printing (GDP). Comprising separate, dedicated material systems, the 10000-G enables digital casting and tooling applications, utilizing the water-breakable DIM WB material with advanced casting materials, plus access to Massivit's set of Gel Dispensing Printing materials. This facilitates direct custom manufacturing and functional prototyping using Dimengel materials that respond to essential industry requirements.



Material	Key Benefit	Massivit 10000	Massivit 10000-G
CIM 500	Epoxy Tooling Resin High Tg, Low CTE. Isotropic	✓	✓
SikaBiresin® CIM 80	Room-Temperature Tooling Cost-Effective	✓	✓
SikaBiresin® CIM 120	Elevated Temperatures. Aluminum-filled, Epoxy Tooling Resin. Isotropic	✓	✓
SikaBiresin® CIM 220	Extremely High Temperatures Aluminum-filled Tooling Resin. Isotropic	✓	✓
CIM 84	Casting material (ASTM E84 Class A) Fire Rated	✓	✓
Dimengel WB	Water Breakable	✓	✓
Dimengel 400	Tough, Enhanced HDT		✓
Dimengel 90	Cost-Effective		✓
Dimengel 100	General Purpose		✓
Dimengel 110	High-Performance		✓
Dimengel 300	Transparent		✓



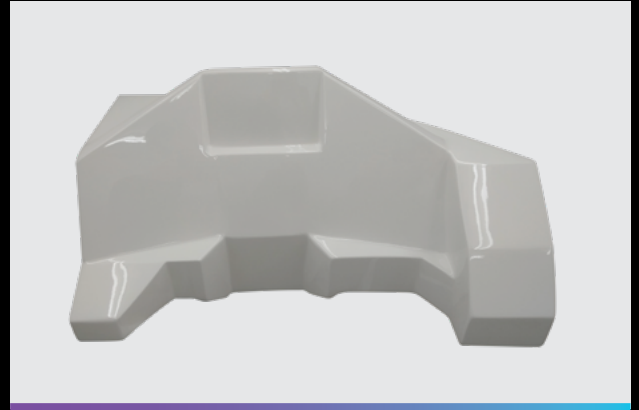


# 10000-G Additional Applications

The Massivit 10000-G directly prints isotropic production molds as well as jigs, fixtures, functional prototypes, and end parts.



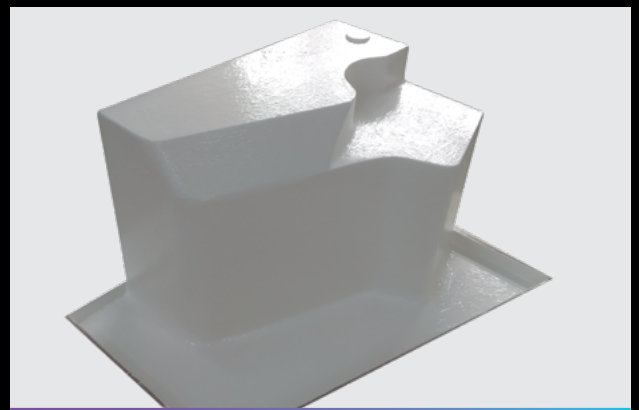
Aftermarket Production



Custom Manufacturing



Jigs & Fixtures



Plugs/masters



Prototypes



Mockups

Image Credits: ©Alstom. Front fairing for REIMS tram 3D printed by Stratiforme Industries. Custom Yacht Dashboard & Vanity 3D Printed by Velum Nautica. Rail Prototype 3D Printed by Stratiforme Industries. Concept Car by Takumi Yamamoto, 3D Printed by Marie 3D.

## Specs at a Glance

Print Configuration	CIM technology: 1 printing head and 1 casting head
	Thermally-controlled print chamber up to 60°C. Removable & interchangeable print tray. Printed shell layer thickness ranges from 0.5 mm-1.3 mm
Print Volume	W x L x H: 1.42 x 1.11 x 1.5 m / 4'8" x 3'8" x 4'11"
Maximum Object Weight	300kg / 660 lbs
Motion System	Linear motors for X/Y print head and servo motors for print tray (Z) height
Materials	Casting epoxies and polyurethanes plus Dimengel photopolymers including a water-breakable material.
Workflow and Software	Software on machine: proprietary front-end software. Input format: STL. Smart Slicer (CAD SW not included)
System Dimensions	W x L x H: 3.1 x 2.2 x 3.1 m / 10'2" x 7'3" x 10'2"
CMS Dimensions	W x L x H: 1.3 x 1.3 x 1.7 m / 4'3" x 4'3" x 5'7"
System Weight	Unpacked ~3500 kg / 7716 lbs. Packed ~4000 kg / 8818 lbs. CMS Unpacked ~621 kg / 1369 lbs. Packed ~687 kg / 1514 lbs

## About Massivit 3D

Massivit Printing Technologies Ltd. [www.massivit3D.com](http://www.massivit3D.com) (Tel Aviv Stock Exchange: 'MSVT') is a leading provider of large-scale 3D printing systems. The company develops and manufactures technology comprising patented hardware, advanced, thermoset polymer materials, and sophisticated software. Massivit's vision is to transform manufacturing of large parts from traditional processes to ultra-fast, digital fabrication using industrial-grade materials. Founded in 2013, Massivit is headquartered in Lod, Israel. The company provides its customers across 40 countries with end-to-end services, supported via an extensive global dealer network.

# Subsystems



## UV System

A ring-shaped UV system allows even curing from all directions. The system is water-cooled to allow work inside a heated chamber.



## Broadcasting System

Three peripheral cameras transmit the printing progress to a dedicated display and can be viewed remotely.



## Static Mixer

The components flow through separate pipes and are only mixed at the exact moment of casting by a static mixer which is easy to clean and replace.

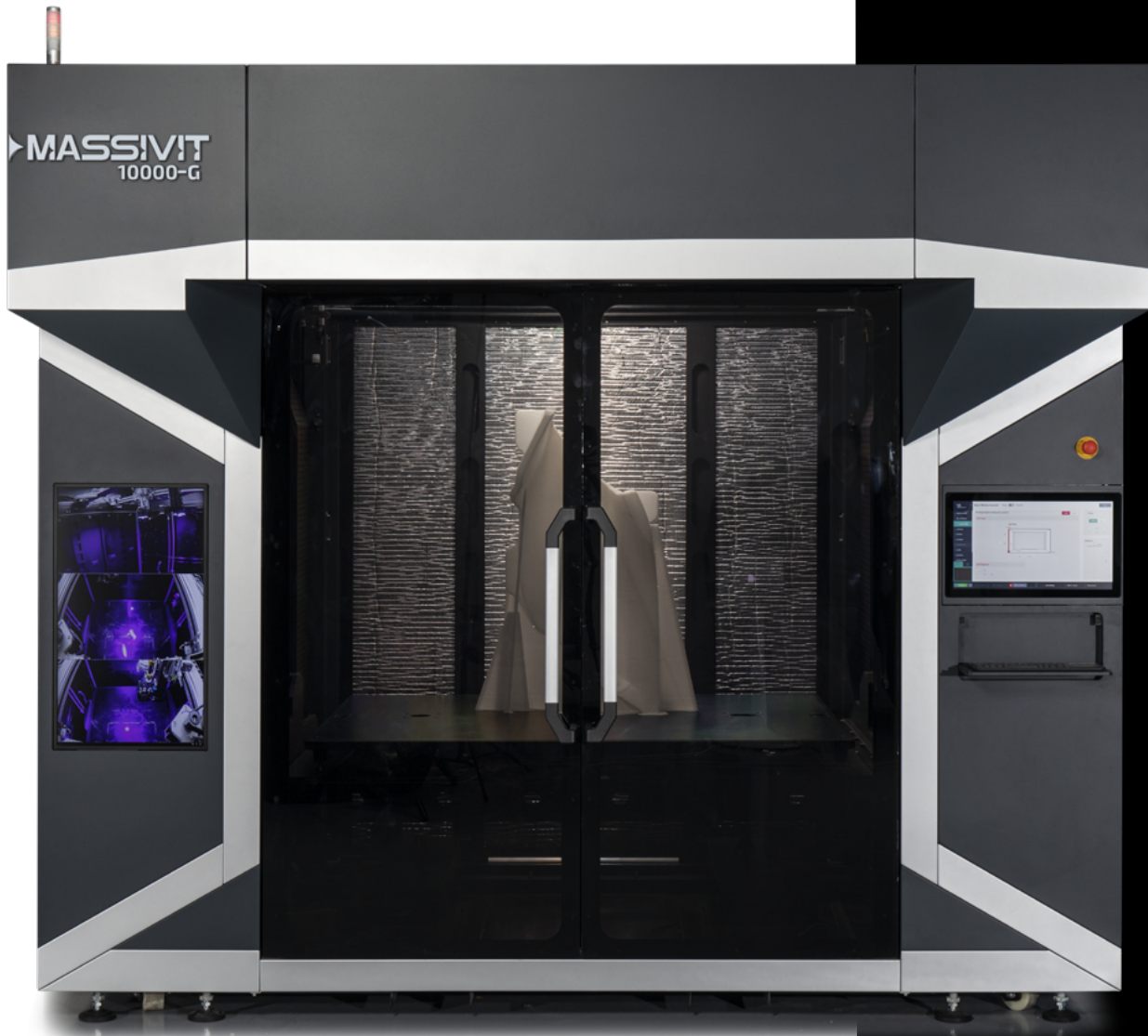


## CMS System

An automated casting system dispenses the A&B components according to the required ratio. The system heats up the two components to ensure a streamlined flow.

# Achieve the Extraordinary

# MASSIVIT



For further information about automated tooling, please contact us:

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