



Cast In Motion: CIM 500

Additive Manufacturing Casting Resin for Composite Tooling

CIM 500 is a modified epoxy system to be used by Massivit 3D's CIM (Cast In Motion) technology, developed for direct printing of tools and molds for the composite materials industry.

Key Advantages:

- Enables isotropic, 3D printed molds
- High heat deflection temperature
- Relatively low thermal expansion

Mechanical Properties

Character	Testing method	Tested value	
		Metric	Imperial
Izod Impact (un-notched)	ASTM D4812 / ISO 180	60.0 ± 4.0 [J/m]	1.12 ± 0.004 [ft.lbf/in]
Linear shrinkage	Internal test	0.1%	0.1%
Shore hardness	ASTM D2240	85D	85D
Tensile			
Stress at break	ISO 527	50.0 ± 3.1 [MPa]	7,250 ± 450 [psi]
Elongation at break	ISO 527	0.9 ± 0.1%	0.9 ± 0.1%
Elasticity modulus	ISO 527	6.1 ± 0.5 [GPa]	884,000 ± 72,000 [psi]
Flexural			
Stress at break	ASTM D790	50.7 ± 5.3 [MPa]	7,350 ± 770 [psi]
Elongation at break	ASTM D790	1.2 ± 0.3%	1.2 ± 0.3%
Elasticity modulus	ASTM D790	6.2 ± 0.8 [GPa]	900,000 ± 110,000 [psi]
Compression			
Compressive Strength	ASTM D695	119 [MPa]	17,260 [psi]
Compressive Modulus	ASTM D695	2.3 [GPa]	333,600 [psi]

Thermal Properties

Character	Testing method	Tested value	
		Metric	Imperial
Tg (DSC)	ASTM D3418	156 [°C]	312 [°F]
HDT	ASTM D648 / ISO 75-2	152 [°C]	305 [°F]
CTE @ 130°C	ASTM D696	29 [ppm/°C]	16 [ppm/°F]
Thermal conductivity, K	ASTM C177 / ISO 8302	0.5-0.6 [W/m·k]	0.30-0.35 [BTU/h·ft·F]

Physical properties

Character	Tested value
Mix ratio by weight	75 A: 25 B
Mixing viscosity @45°C	12,000 [cP]
Specific gravity - mixed	1.53 [g/cm ³]
Pot life @60°C	20 minutes
Pot life @RT	4 hours
Cure Time @RT	24 Hours & must be followed by post-curing
Mixture color	Gray

All measurements were done on lab specimens of cured material, followed by post - cure process. The specifications stated above refer to the Beta version and results were derived from internal lab tests. The material above is under R&D development.

Storage

The material base -A and hardener -B should be stored in a dry place in the sealed original container at temperatures between +2°C and +40°C. Under these storage conditions, the shelf life is 1 year. The product should not be exposed to direct sunlight.

Post-Curing Process

To meet the specified properties, CIM 500 should be heat - cured in a dedicated industrial oven. Consult Application Note for detailed instructions. Post - cured CIM 500 specimens can be milled, polished, or coated with a suitable coating or paint. Let coating fully dry before putting part into service.

Precautionary Statement

Massivit 3D printing technologies maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.