

# Somos<sup>®</sup> DMX SL-100



**Additive manufacturing has fundamentally changed the way complex, hollow composite parts are created. DSM Additive Manufacturing provides an unparalleled solution for producing tough, complex hollow composite parts with a superb surface finish and high feature detail. No other solution allows such easy removal after the autoclave process, enabling multiple iterations to be implemented quickly by the user.**

While basic composite shapes with constant cross sections are easily manufactured using traditional composite manufacturing techniques, complex parts with hollow interiors present a unique challenge. Additive manufacturing has fundamentally changed the process. High temperature, cost effective tools can now be produced in days, compared to the weeks or even months required for traditional tooling, and provides a cost-effective solution even for small series production

Somos<sup>®</sup> DMX-SL™ 100, a durable and tough stereolithography (SL) resin, is an efficient and cost-effective solution that produces very accurate parts with a superb surface finish and high feature detail, promoting greater design freedom for composite applications.

Somos<sup>®</sup> DMX-SL™ 100 withstands the high temperatures utilized in the autoclave process for composites manufacturing maintaining its flexural strength, elongation and tear resistance. These unique properties allow, at a certain temperature, for mandrels to be removed from complex and convoluted geometries through a “dry removal” process which is unique for a solid mandrel. Other soluble wash out cores need submerging in caustic which can affect the composite part. No other material in the industry is as easily and best removed after the autoclave process, facilitating the more efficient production of complex, hollow composite parts.

This method of using additive manufacturing to produce sacrificial tooling is straightforward and enables multiple iterations to be implemented quicker by the user.

## Key Benefits

- Stereolithography accuracy
- High durability
- Stiff & tough parts
- Greater design freedom
- High feature detail
- Smooth internal and external composite surfaces
- Maintains properties throughout composite processing allowing for dry mandrel removal
- Reduces turn-around time from design to part

## Applications

- In Transportation: ducts, pipes and conduits, high-end automotive intake pipes, fluid-holding tanks, electric vehicle (EV) battery cooling solutions
- Consumer products: sports and leisure goods, luxury goods, interior design
- Electronics: bespoke light-weight enclosures, complex wiring looms, robotic components
- Healthcare: precision-molded internals for prosthetics



## Technical Data

Liquid Properties	
Appearance	Off white
Viscosity	~1,500 cps @ 30°C
Density	1.17 g/cm <sup>3</sup> @ 25°C

Optical Properties	
E <sub>c</sub>	15.0 mJ/cm <sup>2</sup>
D <sub>p</sub>	5.50 mils
E <sub>10</sub>	92 mJ/cm <sup>2</sup>

*“Applications and uses for DMX are growing by the day; principal uses include ducts, pipes and conduits, high-end automotive intake pipes, fluid-holding tanks, electric vehicle (EV) battery cooling solutions and even precision-molded internals for prosthetics. A material that was developed for marginal gains on the racing track is now solving tooling solutions across a wide range of sectors.”*

**Jonathan Warbrick, Graphite Additive Manufacturing Limited**

## Mechanical Properties

ASTM r	Property Description	Metric	Imperial
D638M	Tensile Modulus	2,260 - 2,560 MPa	327 - 371 ksi
D638M	Tensile Strength at Break	29.7 - 32.1 MPa	4.3 - 4.7 ksi
D638M	Tensile Strength at Yield	44.1 - 45.5 MPa	6.4 - 6.6 ksi
D638M	Elongation at Break	12 - 28%	12 - 28%
D638M	Elongation at Yield	4%	4%
D638M	Poisson's Ratio	0.40 - 0.42	0.40 - 0.42
D790M	Flexural Strength	68.0 MPa	9.8 - 9.9 ksi
D790M	Flexural Modulus	2,280 - 2,300 MPa	331 - 333 ksi
D2240	Hardness (Shore D)	80	80
D256A	Izod Impact (notched)	0.61 - 0.71 J/cm	1.15 - 1.32 ft-lb/in
D624	Tear Strength	1.1 SI	1.1 SI
D570-98	Water Absorption	0.82 - 0.85%	0.82 - 0.85%

## Technical Data: Thermal, Electrical Properties

E831-05	C.T.E. 40°C - 0°C (-40°F - 32°F)	83.8 - 85.2 μm/m°C	46.6 - 47.3 μin/in°F
E831.05	C.T.E. 0°C - 50°C (32°F - 122°F)	124.0 - 134.1 μm/m°C	68.9 - 74.5 μin/in°F
E831-05	C.T.E. 50°C - 100°C (122°F - 212°F)	181.2 - 185.3 μm/m°C	100.7 - 102.9 μin/in°F
E831-05	C.T.E. 100°C - 150°C (212°F - 302°F)	178.4 - 179.9 μm/m°C	9.1 - 99.9 μin/in°F
D150-98	Dielectric Constant 60 Hz	4.3	4.3
D150-98	Dielectric Constant 1KHz	3.9	3.9
D150-98	Dielectric Constant 1MHz	3.7	3.7
D149-97a	Dielectric Strength	14.1 - 15.8 kV/mm	357 - 400 V/mil
E1545-00	T <sub>g</sub>	37°C	99°F
D648	HDT @ 0.46 MPa (66 psi)	44°C	112°F
D648	HDT @ 1.81 MPa (264 psi)	41°C	106°F

## More information

For more information and buying options, please visit [www.dsm.com/additive-manufacturing/](http://www.dsm.com/additive-manufacturing/)

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