

# UMA 90

UMA 90 is an easy-to-use single cure resin with enhanced toughness, appropriate for use in prototypes and manufacturing jigs and fixtures.

# CarbonResin UMA 90

DOC #103257 REV E  
TECHNICAL DATA SHEET, LAST UPDATED 08/14/2017

<b>Tensile Properties</b> ASTM D638, Type V, 10 mm/min	<b>GREEN STATE</b>		<b>UV-CURED</b>	
	Metric	U.S.	Metric	U.S.
Tensile Modulus	731 ± 120 MPa	106 ± 17 ksi	2000 ± 100 MPa	290 ± 15 ksi
Ultimate Tensile Strength	25 ± 2 MPa	3.6 ± 0.3 ksi	46 ± 3 MPa	6.7 ± 0.4 ksi
Tensile Strength at Yield			46 ± 3 MPa	6.7 ± 0.4 ksi
Tensile Strain at Yield			5.7 ± 0.2%	
Elongation at Break	33 ± 2%		17 ± 2%	

<b>Flexural Properties</b> ASTM D790-B	<b>GREEN STATE</b>		<b>UV-CURED</b>	
	Metric	U.S.	Metric	U.S.
Flexural Stress at 5 % strain	26 ± 2 MPa	3.8 ± 0.3 ksi	79 ± 5 MPa	11.4 ± 0.7 ksi
Flexural Modulus (chord, 0.5-1 % strain)	656 ± 51 MPa	95 ± 7 ksi	2010 ± 119 MPa	291 ± 17 ksi

<b>Impact Properties</b>	<b>UV-CURED</b>	
	Metric	U.S.
Notched Izod (Machined), ASTM D256	33 ± 4 J/m	0.62 ± 0.07 ft-lb/in
Unnotched Izod, ASTM D4812	496 ± 141 J/m	9.29 ± 2.64 ft-lb/in

<b>Thermal Properties</b> ASTM D648	<b>UV-CURED</b>	
	Metric	U.S.
Heat Deflection Temperature @ 0.455 MPa/66 psi	51°C	124°F
Heat Deflection Temperature @ 1.82 MPa/264 psi	44°C	111°F

<b>General Properties</b>	<b>UV-CURED</b>	
	Metric	
Hardness, ASTM D2240	86, Shore D	
Density, ASTM D792	1.200 g/cm <sup>3</sup>	
Density (liquid resin)	1.10 g/cm <sup>3</sup>	

**NOTES**—Results in this data sheet are representative of specific sample generation and testing processes and may vary if the established protocols are not followed. Contact Carbon for the specific process used to generate the test samples to determine each of these values. Tensile and flexural data are average ± 1 standard deviation from 16 specimens; impact data used 10 specimens. The U.S. values are converted from Metric measurements and are for reference only.

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