

# Tough<sup>®</sup>Resin Injection Molding Polydicyclopentadiene

The Molded Fiber Glass Tough<sup>®</sup>Resin Injection Molded process produces parts with many valued qualities. It utilizes two liquid polymer components, which result in a polymeric thermoset unlike a thermoplastic milk container. With this process we can provide lightweight parts, which are unbreakable. Imagine receiving a detailed molded part with low density, high impact strength and dent resistance and that same part being flexible yet with all the stiffness built in that you could desire without sacrificing appearance. This is all possible with T<sup>®</sup>RIM.

The Molded Fiber Glass T<sup>®</sup>RIM process also allows for great flexibility in the size of parts that can be produced. We can provide you with parts which weight from only a few pounds to 200 pounds, which are anywhere from 0.120" - 12" in thickness, and are from a couple of square feet to 120 square feet in size. Throughout this range we will provide you with consistent parts at a price that in many cases is lower than the steel, aluminum, or fiberglass parts that you may be currently utilizing.



Hoods, fenders, bumpers, fairings, steps, doors, covers, and boxes, are some examples of parts that can be produced by the Molded Fiber Glass T<sup>®</sup>RIM process. If you are currently using or will be using any of the above types of parts, or any part similar in size, please contact us at MFG Union City. We would like to provide you with what you are looking for: a tough high quality part at a cost effective price.



A Molded Fiber Glass Company

Molded Fiber Glass Union City • 55 Fourth Avenue • Union City, PA 16438 • 814 438-3841 • [www.mfguc.com](http://www.mfguc.com)

## Typical Mechanical Properties of T#RIM

Property	ASTM Method	
Density, g/cm <sup>3</sup> (lbs/in <sup>3</sup> )	D972	1.03 (0.037)
24 Hr. Water Absorption	D570	0.12%
Tensile Modulus, GPa (Ksi)	D638	1.90 (275)
Tensile Strength @ yield, MPa (Ksi)	D638	46.8 (6.8)
Flexural Modulus, GPa (Ksi)	D790	1.88 (273)
Flexural Strength @ 5% strain, MPa (Ksi)	D790	70 (10.1)
Yield Strain	D638	4.7%
Rockwell Hardness	D785	R114
Notched Izod Impact, J/m (ft-lb/in) @ 23° C (73.4° F)	D256	460 (8.7)
		@-40° C (40° F) 106 (2.0)
Compression Strength, MPa (Ksi)	D695	58.4 (8.5)
Shear Strength, MPa (Ksi)	D732	49.5 (7.2)
DTUL @ 264 psi, ° C (° F)	D648	108 (226) <sup>(1)</sup>
Glass Transition Temperature, ° C (° F)	DMA <sup>(2)</sup>	>138 (>280)
Coefficient of Thermal Expansion, m/m/° C (in/in/° F)	D696	87.8x10 <sup>-6</sup>
		(48.8x10 <sup>-6</sup> )
Dielectric Constant 60Hz @ 73° F	D150	2.66
Dissipation Factor 60Hz @ 73° F	D150	0.0006
Shrinkage in/in (mm/mm)		0.009
Poisson's Ratio (ν)		0.39
Flame Class Rating <sup>(3)</sup>	UL	HB

(1.)HDT will vary with part thickness. Generally about 108° C (226° F) for 3.2 mm (0.125 inch) thick plaques and 120° C (248° F) for 5.5 mm (0.217 inch) thick plaques.

(2.) Dynamic Mechanical Analysis.

(3.) Meets UL yellow-card flame-resistance criteria of UL94-HB at a thickness of 0.125 (3.2mm) and above.

The above mechanical properties are based on conservative values either long term aged or freshly molded.

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