

electrical market



> electrical

Thermoset composite materials have a long and successful history in the electrical market. Offering superior dielectric properties, heat resistance, and high flame resistance, thermoset composites are often the materials of choice for insulating components of electrical systems. Consisting of fiber reinforcement in a polymer resin, thermoset materials such as bulk molding compound (BMC) and sheet molding compound (SMC) owe many of their special properties to a process known as crosslinking.

- **What is crosslinking?** Composite resins begin as liquid polymers, but they're changed to solids during the molding process. Exposure to thermal energy causes crosslinking, the formation of three-dimensional covalent bonds between the polymer molecules. Thermoset materials are permanently solidified by the crosslinking process, which means they cannot be melted and reshaped like thermoplastics.
- **Why is it important?** Crosslinking creates a rigid molecular structure that allows thermosets to provide excellent electrical resistance and physical properties even during prolonged exposure to elevated temperatures. Parts molded from thermoplastic materials will often melt during exposure to electrical arcing or tracking. But thermosets hold up well during these processes, undergoing no significant changes. Thermosets offer comparative tracking index values in excess of 600 volts and dielectric strength of over 15 kilovolts per millimeter. In the electrical industry, BMC and SMC are used to make parts with track resistance greater than 600 minutes and arc resistance greater than 180 seconds.
- **What electrical applications are right for thermosets?** Thermoset materials are also used to make electrical switches, boxes, housings, and cabinets. Dating back more than 50 years, many of the first electrical cabinets made of thermoset composites are still in use. Many electrical designers specify thermosets for insulating components of switchgear, circuit breakers, standoff insulators, and motor brush holders.

engineered for performance

Property	Unit	Test Method	44-10	46-12	48-50	E-204	E-206
Physical and Mechanical Properties							
Impact Strength	FT-LBS/IN	ASTM D 256	4-5	8-10	4-5	12	16
Flexural Strength	PSI	ASTM D 790	15-17,000	19-22,000	14-16,000	23,000	30,000
Flexural Modulus	10 ⁶ PSI	ASTM D 790	--	--	2.0	1.6	2.0
Tensile Strength	PSI	ASTM D 638	6,000	7-9,000	6,000	11,000	16,000
Compressive Strength	PSI	ASTM D 695	21,000	23,000	24,000	27,000	32,000
Water Absorption	%	ASTM D 570	0.15	0.15	0.11	0.10	0.13
Specific Gravity	G/CM ³	ASTM D 792	1.96	1.78	1.93	1.78	1.72
Shrinkage	IN/IN	ASTM D 955	0.001-0.003	0.001-0.003	0.001-0.003	0.001	0.001
Hardness	Barcol	ASTM D 2583	40-50	30-50	40-50	30-35	40-45
Bulk Factor App.	--	ASTM D 1895	1	1	1	1	1
Electrical Properties							
Dielectric Strength	KV/IN	ASTM D 149	--	290	320	380	340
Arc Resistance	Seconds	ASTM D 495	180+	180+	190	180+	180+
Thermal and Flame Retardant Properties							
Heat Deflection Temperature @264PSI	°F	ASTM D 648	>500	>500	>500	>500	>500
Flame Resistance	--	UL 94	--	--	--	--	--
	@1/16"	--	94-HB	V-0	94V-0	94V-0	94V-0
	@1/8"	--	94-5V	V-0	94V-0	94V-0	94V-0
	@1/4"	--	94-5V	V-0	94V-0	94V-0	94V-0

IDI Composites International is the premier global formulator and manufacturer of thermoset molding compounds for custom molders and OEMs. The company provides customized polyester/vinylester-based bulk molding compounds (BMC) and sheet molding compounds (SMC) for the world's most demanding markets, including automotive/truck, electrical, food service, alternate energy, and appliance.

Headquartered in a 200,000 square foot facility in Noblesville, IN (USA), IDI has a strong presence in the international thermoset composites market. To support a growing customer base world-wide, the company operates multiple wholly-owned manufacturing facilities in Europe, Asia, and The Americas.

www.idicomposites.com

The Americas

IDI Composites International
407 S. 7th Street
Noblesville, IN 46060 U.S.A.
317-773-1766
Fax: 317-773-3877
info@idicomposites.com

IDI Composites International
P.O. Box 400
Road #3, KM 151.8
Aguirre, Puerto Rico 00704
787-853-2186
Fax: 787-853-2187
idicomposites@coqui.net

Asia/Pacific

IDI Composites International
No. 8, Lane 275, QianPu Road
New Eastern Section of
Sonjiang Industrial Park
Shanghai, 201611 China
86-21-51096910
Fax: 86-21-67601689
rrodriguez@idicomposites.com

IDI Composites International
Shenzhen Company, LTD.
P.O. Box 107
Fucheng Industrial Park
Hongtian, Xinqiao, Sajing Town
Bao An, Shenzhen, 518125 China
86-755-27229550
Fax: 86-755-27229554
rrodriguez@idicomposites.com

Europe

IDI Composites International
Unit One, Oldbury Park
Popes Lane
Oldbury, West Midlands
B69 4RG U.K.
44-121-552-0038
Fax: 44-121-543-5377
pgarland@idicomposites.co.uk