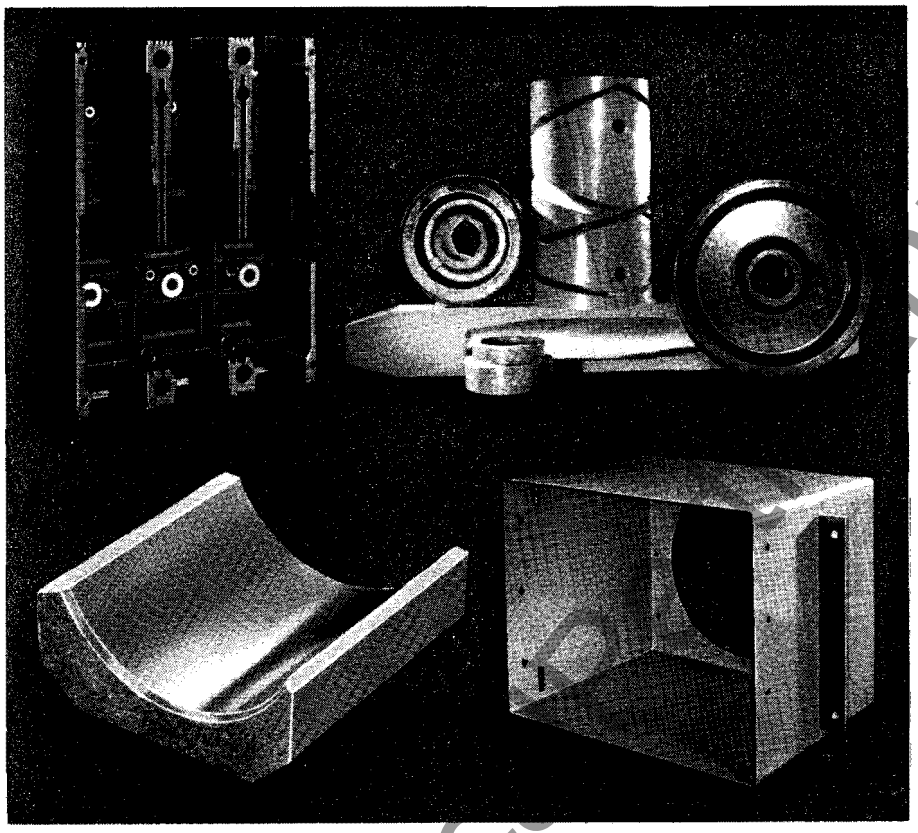
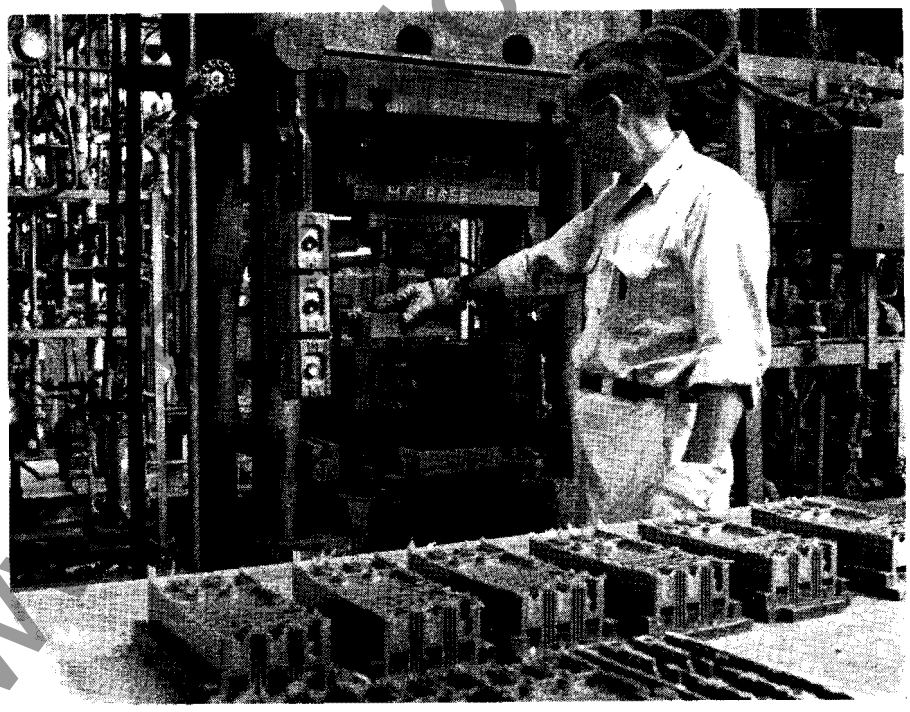
Westinghouse

Micarta® Molding Compounds

General Purpose, Special Purpose
Flame Retardant





Application

The Industrial Micarta Division developed the compounds listed to mold a particular part or to meet a specification. The mechanical and electrical properties were determined from representative specimens of the material while under development. Mechanical properties are subject to considerable variation. Where required, a specific mechanical property can be favored by selecting process techniques.

Reinforced molding materials with superior electrical properties are usually molded as complex shapes. Such parts are most successful when a molding material is designed for the specific application. The molded part – its configuration, its function and environmental requirements – should specify the material used for molding.

The Micarta Divisions manufacture a variety of molded, laminated, macerated, and reinforced products. Reinforced and macerated-base products are standard items. They are molded according to the drawing and specifications of the purchaser. Because of the Divisions' comprehensive molding facilities, a great variety of products can be mass produced, including electrical parts of all kinds, combined metal and plastic parts, and mechanical parts, such as caster wheels, timing gears, spinning buckets, shuttle forms.

March, 1968
New Information
E, D, C, WC/05, 06

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Application Guide

Grade Number	Color	Major Application Requirements	Typical Uses
General Purpose Compounds			
5M85	Grey	Excellent moldability. Crack resistant.	Breaker boxes and covers.
5M113	Black	Molds well in thick sections. Flows well in deep draws.	Breaker boxes and covers.
5M114	Black	Excellent gloss and surface appearance.	Switch boxes.
5M121	Black	Best for complex shapes. Good for transfer molding.	Switch boxes.
5M125	Black	High flexural and impact strength. For structural members.	Switch handles.
5M130	Black	Chemical resistant.	Chemical pipe fittings.
Flame-Retardant Compounds			
5M82	Red	High flame resistance and dielectric strength. Track resistant. Good moldability.	Electrical moldings.
5M119	Blue-Grey	High impact strength. Track resistant. Molds well in thick sections. Excellent surface appearance.	Contactor parts.
5M120	Blue-Grey	High heat distortion. Track resistant. High arc resistance. Outstanding in resistance to surface wear.	Switches, arc boxes, tap changers.
Special Purpose Compounds			
5M77	Grey	Specially formulated and processed to mold essentially void-free thick sections. Thick sections have high corona starting voltage.	Moldings under high electrical stress.
5M79	Grey	Moldings are resistant to acids, alkalis, many solvents.	Moldings used in corrosive environment.
5M88	Blue	Excellent dielectric strength. Good impact resistance.	Electrical barrier plates.
5M100	Grey	Very high dust and fog tracking resistance. Surface has excellent wear resistance.	Contactor Bases.
5M103	Grey	High resistance to thermal degradation. Molded parts hold dimensions under high temperature service.	Coil spools.
5M107	Grey	Track resistant. Formulated for transfer molding small shapes.	Spacers, stand-off sleeves.
5M115	Blue-Grey	High compressive strength. Molded parts exhibit low flow under load at elevated temperature.	U. L. listed for continuous use up to 150°C.
5M118	Black	Chemical resistant. Molds well in thick sections (1½").	Chemical pipe fittings.

Mechanical and Electrical Properties

Property	ASTM Method	Condition	Micarta General Purpose Compounds						Flame Retardant Compounds		
			5M85	5M113	5M114	5M121	5M125	5M130	5M82	5M119	5M120
Specific Gravity	D-792-60T	A	1.80	2.08	1.96	2.04	1.85	2.02	1.98	1.88	1.97
Water Absorption, %	D-570-63	A	.70	.27	.13	.24	.112	.05	.09	.13	.04
Impact Strength, Foot-Lbs./Inch Notch	D-256-56	A	1.80	2.25	1.80	1.90	5.50	.....	3.37	5.15	2.60
Flexural Strength, psi	D-790-63	A	9,400	12,800	9,200	10,200	18,000	.....	15,000	13,900	10,700
Tensile Strength, psi	D-651	A	3,800	4,000	3,600	4,000	.....	.....	4,000	5,000	6,100
Compressive Strength, psi	D-695-63T	A	21,700	30,700	27,000	34,000	51,500	37,000	38,000	25,000	33,700
Arc Resistance, Seconds	D-495-61	A	100	170	184	186	186	180	186	183	245
Dissipation Factor, 60 cps	D-150-59T	A	.025	.024	.019	.03	.036	.....	.016	.055	.020
Dielectric Constant, 60 cps	D-150-59T	A	5.40	6.10	5.80	5.30	6.15	4.30	5.30	5.70	4.50
Dielectric Strength, Volts per mil	D-419-611	A●	312	328	300	310	320	400	340	315	340
Track Resistance, hours	WEC 80308	A②	.....	.....	.....	.....	.....	.....	264	245	208
Flame Resistance, Ignition, seconds	WEC 80312	A③	.....	.....	.....	.....	.....	.....	130	100	120
Burning, seconds	WEC 80312	A③	.....	.....	.....	.....	.....	.....	19	14	20
Heat Distortion, °F	D-648-56	A	.....	.....	.....	.....	.....	.....	380	390	420
Hardness, Barcol	.....	A	60-65	65-70	60-65	60-65	.....	65-70	65-70	65-70	50-55

Property	ASTM Method	Condition	Micarta Special Purpose Compounds							
			5M77	5M79	5M88	5M100	5M103	5M107	5M115	5M118
Specific Gravity	D-792-60T	A	1.78	1.70	1.69	1.72	1.97	2.11	1.92	1.90
Water Absorption, %	D-570-63	A	.60	.21	.22	.17	.24	.30	.13	.10
Impact Strength, Foot-Lbs./Inch Notch	D-256-56	A	2.50	4.40	4.00	3.50	4.20	1.70	2.20	3.50
Flexural Strength, psi	D-790-63	A	5,600	17,900	8,500	12,200	11,800	11,800	14,300	12,200
Tensile Strength, psi	D-651	A	3,600	4,900	5,450	4,700	4,500	3,900	4,200	4,400
Compressive Strength, psi	D-695-63T	A	19,200	33,300	26,500	33,800	40,600	42,000	51,500	32,000
Arc Resistance, Seconds	D-495-61	A	189	183	128	185	167	183	157	180
Dissipation Factor, 60 cps	D-150-59T	A	.05	.082	.045	.012	.020	.049	.012	.020
Dielectric Constant, 60 cps	D-150-59T	A	5.90	5.00	5.70	4.58	5.67	6.48	5.78	4.60
Dielectric Strength, Volts per mil	D-419-61	A①	320	300	360	310	305	355	350	342
Track Resistance, hours	WEC 80308	A②	.....	92	.....	468	.....	338	.....	.....
Flame Resistance, Ignition, seconds	WEC 80312	A③	.....	.....	.....	.....	.....	.....	.....	.....
Burning, seconds	WEC 80312	A③	.....	.....	.....	.....	.....	.....	.....	.....
Heat Distortion, °F	D-648-56	A	.....	.....	.....	470	.....	.....	500	.....
Hardness, Barcol	.....	A	50-55	55-60	65-70	55-60	60-65	60-65	70-75	65-70

Condition A: Test specimens conditioned 48 hours at 23°C and 50% humidity before testing.

① Perpendicular in oil.
② Dust and fog tracking resistance, 1500 volts, scintillation current- 3 to 9 milliamperes.
③ Specimen ½" x ½" x 6", electrically heated coil (860°C). Spark ignition. Report-ignition time and burning time.

Westinghouse Electric Corporation
Industrial Micarta Division, Hampton, S. C. 29924
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