PLAINTIFF'S EXHIBIT

UC-5307

BAKELITE® PHENOLIC MOLDING MATERIALS GUIDE

NO._____

REGISTERED FOR THE
PERSONAL USE OF...
CARLO MARTINO

UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
270 PARK AVENUE
NEW YORK, N.Y. 10017

F-41889A

UNION CARBIDE

A 14057

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Description of Powder Properties
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UNION CARBIDE

BAKELITE® PHENOLIC MOLDING MATERIALS

	PRODUCT TYPES				
	GENERAL PURPOSE	HEAT RESISTANT	IMPROVED IMPACT	ELEC-TRICAL	CHEMICAL RESISTANT
BMG-0750 Natural				•	
BMG-2080 Black-25			•		
BMMA-3066 Black-15 DC	•				
BMG-5000 Black-25	•				
BMM-5000 Black-25 DC	•				
BMMB-5020 Black-25 DC	•				
BMM-5303 Black-25 DC		•			
BMRS-5303 Black-25 DC		•			
BMMC-5333 Black-25 DC		•			
BMMS-5333 Black-25 DC		•			
BMMA-5353 Black-25 DC		•			
BMRS-5353 Black-25 DC		•			
BMMA-5440 Black-25 DC	•	•			
BMRS-5440 Black-25 DC	•	•			
BMMA-5441 Black-25 DC	•	•			
BMRS-5441 Black-25 DC	•	•			

(continued)

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SECTIONS INDEX (cont.)

BAKELITE® PHENOLIC MOLDING MATERIALS

	PRODUCT TYPES					
	GENERAL PURPOSE	HEAT RESISTANT	IMPROVED IMPACT	ELEC-TRICAL	CHEMICAL RESISTANT	
BMRS-5442 Black-10 DC			•			
BMG-5498 Black-25	•					
BMM-5498 Black-25 DC	•					
BMM-7002 Black-25 DC	•					
BMMB-7021 Black-25 DC			•			
BMRS-7021 Black-25 DC			•			

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Temperature Conversion Tables
Steam Table – Temperatures vs. Pressures
Specific Gravity and Cost Relationships
Trouble Shooting Checklist
Price Lists
General Information
Sales Offices

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NOMENCLATURE DESCRIPTION

UNION CARBIDE Phenolic Molding Materials are all identified by a 3- or 4-letter prefix followed by 4 digits and then the color designation. An example is BMG-5000 Black-25. The following explains the significance of the various letters and numbers:

1. **The Significance of the Letter Prefixes**

   First Letter (B)

   Designates that the material is based on a phenol-formaldehyde resin.

   Second Letter (M)

   Designates that the material is to be used for molding.

   Third Letter (G, M, or R)

   Designates the type of granulation in respect to particle size and content.

   Fourth Letter

   In most instances, designates a minor change in the formula, new product, or product specifications.

2. **Significance of Numerical Designation**

   First Number

   Designates the type of phenol-formaldehyde resin upon which the compound is based, *e.g.*, 5 and 7 designate a two-step resin system; 2 designates a one-step; 0, 8, or others designate the use of one or more special resins.

   The Last Three Numbers

   These are used to designate the specific compound.

3. **Significance of Numerical Color Designations for Blacks**

   Black-25

   Designates the standard Black particularly suitable for electrical applications.

   Black-15

   Contains a non-bleeding Black. Not recommended for electrical applications.

Products which are specially processed to remove extremely fine particles (or "smoke") carry the letters "DC" (dust controlled) after the color designation and number, *e.g.*, BMMA-5440 Black-25 DC.

UNION CARBIDE molding plasticity or flow designations follow the color number and are called Grades. Standard Grades are 6, 9, 12, 15, and 18.

November, 1971
F-43628

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DESCRIPTION OF POWDER PROPERTIES

BAKELITE Phenolic Molding Materials are supplied in several different granulations intended for optimum performance in the various molding processes.

BMG – This is the finest of the three granulations supplied. It is recommended particularly for applications where preforms are used.

BMM – This granulation is manufactured with fewer fines. It is recommended primarily for automatic powder loading. A DC designation after the color number indicates that the material has been specially processed to remove fine particles of "smoke". It may also be preformed.

BMRS – Granulation and formulation for screw preheating, particularly in-line injection molding. BMRS materials are normally processed to a DC granulation.

November, 1971
F-43629

A 14331

Published by AsbestosClaims.Law
asbestosclaims.law/library/19769/5

DEFINITIONS OF USEFUL PROPERTIES

Definitions of some of the properties described in the following data sheets are given below and, when applicable, the test designation of the American Society for Testing Materials (prefaced by the letter D)

1. **Plasticity Grade** – A number (i.e. 6,9,12,15,18, and 21) assigned to a molding material indicating its flow properties. Increasing grade designations denote materials of softer flow.

2. **Bulk Factor (D 392)** – The ratio of the volume which a given quantity of loose molding powder occupies to the volume which the same quantity occupies after molding.

3. **Molding Shrinkage (D 955)** – The difference, per unit of length, between the cooled molded piece and the cold mold, expressed in inches per inch. The shrinkage values published herein have been derived by the standard testing methods identified and may be compared with other shrinkage values similarly obtained. However, it must be recognized that shrinkage varies with mold design and molding conditions. Therefore, the published values may not accurately predict the shrinkage which will occur in any given application.

4. **Dielectric Strength (D 149)** – The maximum potential gradient which a given test specimen can withstand without rupture The test values listed herein were obtained from short-time or instantaneous dielectric strength tests made by increasing the applied voltage continuously at a specified rate until rupture occurs.

5. **Volume Resistivity (D 257)** – The ratio of applied voltage to current flowing between two electrodes covering opposite faces of a centimeter cube as calculated from measurements made on a given specimen of other geometric shape.

6. **Dielectric Constant (D 150)** – The ratio of the equivalent parallel capacitance, measured at a specified frequency, of a capacitor in which the material is the dielectric to the capacitance of the same capacitor with a vacuum (or air) as the dielectric.

7. **Dissipation Factor (D 150)** – A measure of the loss of energy to the material when it is the dielectric in a capacitor in an alternating electrical field.

8. **Water Absorption (D 570)** – The quantity of water absorbed by a given test specimen after immersion for a period of 24 hours at 23°C. Water absorption is determined by the per cent gain in weight of the test specimen.

November, 1971
F-41863A

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9. **Izod Impact Strength (D 256)** – An indication of the susceptibility to fracture by shock as determined by measuring the mechanical energy required to break a standard notched specimen with a single blow. Izod Impact Strength is expressed in ft-lb/inch of notch.

10. **Compressive Strength (D 695)** – The compressive stress, calculated in pounds per square inch, required to cause failure of a given test specimen.

11. **Tensile Strength (D 651)** – The tensile stress or pull, calculated in pounds per square inch, required to break a given test specimen.

12. **Flexural Strength (D 790)** – The maximum fiber stress, in pounds per square inch, sustained by a given test specimen, calculated from the bending load required to break it.

13. **Modulus of Elasticity (D 790)** – The ratio of unit stress to unit strain within the range where stress and strain are proportional.

14. **Specific Gravity (D 792)** – The ratio of the weight of a given volume of the material to the weight of an equal volume of water at the same temperature.

15. **Heat Deflection Temperature (D 648)** – The temperature at which a 1/2 inch x 1/2 inch bar is deflected 0.010 inch over a 4 inch span, when under a maximum fiber stress of 264 psi.

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MATERIALS QUALIFIED
UNDER FEDERAL SPECIFICATION
MIL-M-14F

TYPE	DESCRIPTION	COMPOUND NUMBER
CFG	Cellulose Filled	BMG-8052 Maroon-65
		BMMA-5441 Black-25
		BMRS-5441 Black-25
		BMRS-7026 Black-25
MFE	Mineral Filled; Best Electrical	BMG-0750 Natural
		BMGS-0750 Natural
MFH	Mineral Filled	BMGA-3700 Green-155

QUALIFICATIONS: Materials qualified under this specification are approved for the particular types shown above. Qualification stipulates approved type and color.

CERTIFICATION: An affidavit certifying compliance with the requirements of this specification may be obtained on request for the products listed above.

November, 1971
F—41865A

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MATERIALS GRANTED
UNDERWRITERS' LABORATORIES
YELLOW CARD COMPONENT RECOGNITION

	TEMPERATURE RATING, °C., 1/16" THICKNESS	FLAMMABILITY	ARC RESISTANCE
BMMA-5440 Black-25 DC	150	SE-O	110
BMRS-5440 Black-25 DC	150	SE-O	110
BMMD-5303 Black-25 DC	150	SE-O	180
BMRS-5303 Black-25 DC	150	SE-O	180

November, 1971
F- 43765

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asbestosclaims.law/library/19769/9

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMMA-3066
Black-15 DC
General Purpose

DESCRIPTION

BMMA-3066 Black-15 DC is a general purpose, two-step, woodflour filled, molding material possessing an unusual combination of properties; it is fast curing, has a wide molding latitude, and is low in fines content. BMMA-3066 Black-15 DC is characterized by its resistance to bleeding when in contact with alcohol or parts spray painted or vacuum plated. It is specially designed for caps and closures. Molded parts are rigid on discharge from the mold, have high surface gloss and excellent strength properties.

PROPERTIES

	TYPICAL VALUES		
FABRICATION			
Plasticity Grades Available	7,6,10		
Bulk Factor (D 392)	2.3, max.		
Molding Shrinkage (D 955), inch/inch	0.004-0.007		
MECHANICAL			
Izod Impact Strength (D 256), ft.-lb./in. notch	0.30, av.		
Compressive Strength (D 695), psi.	30,400, av.		
Tensile Strength (D 651), psi.	6,590, av.		
Flexural Strength (D 790), psi.	7,500, av.		
Modulus of Elasticity in Flexure (D 790), psi.	1.1×10^6, av.		
ELECTRICAL			
Dielectric Strength, Short Time (D 149), volts/mil.	294, av.		
Volume Resistivity (D 257), ohm-cm.	1.0×10^{12} av.		
	60~	10^3~	10^6~
Dielectric Constant (D 150)	7.0, av.	6.2, av.	5.3, av.
Dissipation Factor (D 150)	0.11, av.	0.05, av.	0.04, av.
MISCELLANEOUS			
Molded Specific Gravity (D 792)	1.34-1.37		
Deflection Temp. at 264 psi. (D 648), °F.	347, av.		
Water Absorption, gain in weight (D 570), per cent	0.53, av.		
Rockwell Hardness, "E" Scale	92, av.		

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December, 1973
F-41874B

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BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMG-5000
Black-25
General Purpose

DESCRIPTION

BMG-5000 Black-25 is a general purpose, two-step woodflour filled material of the widest versatility. BMG-5000 Black-25 is eminently suitable for molding process requiring preforms.

BMG-5000 Black-25, of low specific gravity, may be electronically preheated over an unusually broad range of temperatures; molds on shorter cycles to produce jet black pieces of high gloss and surface quality. The excellent hot rigidity and resistance to warping of BMG-5000 Black-25 ensure the maintenance of close dimensional accuracy in the molded piece.

BMG-5000 Black-25 meets the requirements of ASTM Specification D 700, Type 2.

PROPERTIES — TYPICAL VALUES

FABRICATION		
Plasticity Grades Available	9,12,15	
Bulk Factor (D 392)	2.4, max.	
Molding Shrinkage (D 955), inch/inch	0.003-0.006	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.31, av.	
Compressive Strength (D 695), psi.	30,600, av.	
Tensile Strength (D 651), psi.	7,300, av.	
Flexural Strength (D 790), psi.	9,500, av.	
Modulus of Elasticity in Flexure (D 790), psi.	10×10^5, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil.	315, av.	
Volume Resistivity (D 257), ohm-cm.	20×10^{11}, av.	
	60Hz	1MHz
Dielectric Constant (D 150)	6.2, av.	4.8, av.
Dissipation Factor (D 150)	0.11, av.	0.04, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.32-1.36	
Deflection Temp. at 264 psi. (D 648), °F.	325, av.	
Water Absorption, gain in weight (D 570), per cent	0.45, av.	
Rockwell Hardness, "E" Scale	92, av.	

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December, 1973
F-41871B

A 14307

BAKELITE

PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMM-5000 Black-25 DC General Purpose

DESCRIPTION

BMM-5000 Black-25 DC is a general purpose, two-step woodflour filled material of the widest versatility, combining many properties found only in specialized compounds. BMM-5000 Black-25 DC is eminently suitable for cold powder or preheated powder automatic molding equipment.

BMM-5000 Black-25 DC, of low specific gravity, may be electronically preheated over an unusually broad range of temperatures; molds on shorter cycles to produce jet black pieces of high gloss and surface quality. The excellent hot rigidity and resistance to warping of BMM-5000 Black-25 DC ensure the maintenance of close dimensional accuracy in the molded piece.

BMM-5000 Black-25 DC meets the requirements of ASTM Specification D 700, Type 2.

PROPERTIES

	TYPICAL VALUES	
FABRICATION		
Plasticity Grades Available	12	
Bulk Factor (D 392)	2.4, max.	
Molding Shrinkage (D 955), inch/inch	0.003-0.006	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.31, av.	
Compressive Strength (D 695), psi.	30,600, av.	
Tensile Strength (D 651), psi.	7,300, av.	
Flexural Strength (D 790), psi.	9,500, av.	
Modulus of Elasticity in Flexure (D 790), psi.	10×10^6, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	315, av.	
Volume Resistivity (D 257), ohm-cm.	20×10^{11}, av.	
	60Hz	1MHz
Dielectric Constant (D 150)	6.2, av.	4.8, av.
Dissipation Factor (D 150)	0.11, av.	0.04, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.32-1.36	
Deflection Temp. at 264 psi. (D 648), °F.	325, av.	
Water Absorption, gain in weight (D 570), per cent	0.45, av.	
Rockwell Hardness, "E" Scale	92, av.	

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December, 1973
F-41872B

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BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMMA-5440
Black-25 DC
General Purpose

DESCRIPTION

BMMA-5440 Black-25 DC is a wide latitude, general purpose compound which molds with an exceptionally smooth surface and has better dimensional stability at elevated temperatures and in high humidities than counterparts in the same specific gravity range. This improved product is made for all types of molding. Though it is particularly well suited for decorative appliance parts, it can also be used for electrical and functional parts requiring good dimensional stability.

BMMA-5440 Black-25 DC has been granted UL "Yellow Card" component recognition for use at temperatures not exceeding 150°C. in thicknesses no less than 1.16-inch. It also has an SE-0 flammability at 1/16-inch rating and an arc resistance rating of 110 seconds.

PROPERTIES

	TYPICAL VALUES	
FABRICATION		
Plasticity Grades Available	6,9,12,15	
Bulk Factor (D 392)	2.4, max.	
Molding Shrinkage (D 955), inch/inch	0.003-0.006	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.31, av.	
Compressive Strength (D 695), psi.	29,800, av.	
Tensile Strength (D 651), psi.	6,500, av.	
Flexural Strength (D 790), psi.	8,300, av.	
Modulus of Elasticity in Flexure (D 790), psi.	10×10^5, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	330, av.	
Volume Resistivity (D 257), ohm-cm.	2.0×10^{17}, av	
	60Hz	1MHz
Dielectric Constant (D 150)	7.0, av.	5.0, av.
Dissipation Factor (D 150)	0.14, av.	0.04, av
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.38-1.42	
Deflection Temp. at 264 psi., °F.	350, av.	
Water Absorption, gain in weight (D 570), per cent	0.30, av.	
Rockwell Hardness, "E" Scale	92, av.	

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December, 1973
F-43627A

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BAKELITE

PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMMA-5440
Black-25 DC
Heat Resistant

DESCRIPTION

BMMA-5440 Black-25 DC is a wide latitude, general purpose compound which molds with an exceptionally smooth surface and has better dimensional stability at elevated temperatures and in high humidities than counterparts in the same specific gravity range. This improved product is made for all types of molding. Though it is particularly well suited for decorative appliance parts, it can also be used for electrical and functional parts requiring good dimensional stability.

BMMA-5440 Black-25 DC has been granted UL "Yellow Card" component recognition for use at temperatures not exceeding 150°C. in thicknesses no less than 1/16-inch. It also has an SE-O flammability at 1/16-inch rating and an arc resistance rating of 110 seconds.

PROPERTIES

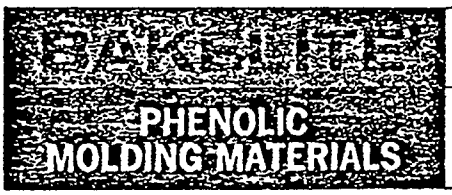
	TYPICAL VALUES	
FABRICATION		
Plasticity Grades Available	6,9,12,15	
Bulk Factor (D 392)	2.4, max.	
Molding Shrinkage (D 955), inch/inch	0.003-0.006	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.31, av.	
Compressive Strength (D 695), psi.	29,800, av.	
Tensile Strength (D 651), psi.	6,500, av.	
Flexural Strength (D 790), psi.	8,300, av.	
Modulus of Elasticity in Flexure (D 790), psi.	10×10^5, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	330, av.	
Volume Resistivity (D 257), ohm-cm.	2.0×10^{12}, av.	
	60Hz	1MHz
Dielectric Constant (D 150)	7.0, av.	5.0, av.
Dissipation Factor (D 150)	0.14, av.	0.04, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.38-1.42	
Deflection Temp. at 264 psi., °F.	350, av.	
Water Absorption, gain in weight (D 570), per cent	0.30, av.	
Rockwell Hardness, "E" Scale	92, av.	

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December, 1973
F-44665

A 14370



DESCRIPTION

BMMA-5441 Black-25 DC is a wide latitude, general purpose compound which molds with exceptionally smooth surface and has better dimensional stability at elevated temperatures and in high humidities than counterparts in the same specific gravity range. This improved product is made for all types of molding. Though it is particularly well suited for decorative appliance parts, it can also be used for electrical and functional parts requiring good dimensional stability.

BMMA-5441 Black-25 DC is recommended for use under Type CFG of Military Specification MIL-M-14F.

PROPERTIES	TYPICAL VALUES	
FABRICATION		
Plasticity Grades Available	6,9,12,15	
Bulk Factor (D 392)	2.4, max.	
Molding Shrinkage (D 955), inch/inch	0.003-0.006	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.31, av.	
Compressive Strength (D 695), psi.	29,000, av.	
Tensile Strength (D 651), psi.	6,500, av.	
Flexural Strength (D 790), psi.	8,300, av.	
Modulus of Elasticity in Flexure (D 790), psi.	10×10^4, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	330, av.	
Volume Resistivity (D 257), ohm-cm.	2.0×10^{12}, av.	
	60Hz	1MHz
Dielectric Constant (D 150)	7.0, av.	5.0, av.
Dissipation Factor (D 150)	0.14, av.	0.04, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.38-1.42	
Deflection Temp. at 264 psi., °F.	350, av.	
Water Absorption, gain in weight (D 570), per cent	0.30, av.	
Rockwell Hardness, "E" Scale	92, av.	

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December, 1973
F-44666

A 14071

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMMA-5441
Black-25 DC
General Purpose

DESCRIPTION

BMMA-5441 Black-25 DC is a wide latitude, general purpose compound which molds with exceptionally smooth surface and has better dimensional stability at elevated temperatures and in high humidities than counterparts in the same specific gravity range. This improved product is made for all types of molding. Though it is particularly well suited for decorative appliance parts, it can also be used for electrical and functional parts requiring good dimensional stability.

BMMA-5441 Black-25 DC is recommended for use under Type CFG of Military Specification MIL-M-14F.

PROPERTIES — TYPICAL VALUES

FABRICATION		
Plasticity Grades Available	6,9,12,15	
Bulk Factor (D 392)	2.4, max.	
Molding Shrinkage (D 955), inch/inch	0.003-0.006	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.31, av.	
Compressive Strength (D 695), psi.	29,000, av.	
Tensile Strength (D 651), psi.	6,500, av.	
Flexural Strength (D 790), psi.	8,300, av.	
Modulus of Elasticity in Flexure (D 790), psi.	10×10^6, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	330, av.	
Volume Resistivity (D 257), ohm-cm.	2.0×10^{13}, av.	
	60Hz	1MHz
Dielectric Constant (D 150)	7.0, av.	5.0, av.
Dissipation Factor (D 150)	0.14, av.	0.04, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.38–1.42	
Deflection Temp. at 264 psi., °F.	350, av.	
Water Absorption, gain in weight (D 570), per cent	0.30, av.	
Rockwell Hardness, "E" Scale	92, av.	

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December, 1973
F-43626A

A1-372

BAKELITE

PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMG-5498
Black-25
General Purpose

DESCRIPTION

BMG-5498 Black-25 is a general purpose, two-step, phenolic molding material. It can be molded readily under conditions normally prescribed for general purpose formulations. Prewarming is recommended if maximum electrical insulating quality is desired. Molding latitude, relatively fast cure, and balanced end properties make BMG-5498 Black-25 suitable for a variety of applications.

BMG-5498 Black-25 meets the requirements of Military Specification MIL-C-13428A and the requirements of ASTM Specification D 700, Type 2.

TYPICAL VALUES

PROPERTIES		
FABRICATION		
Plasticity Grades Available		9,12,15
Bulk Factor (D 392)		2.4, max.
Molding Shrinkage (D 955), inch/inch		0.003-0.006
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch		0.31, av.
Compressive Strength (D 695), psi.		30,600, av.
Tensile Strength (D 651), psi.		7,300, av.
Flexural Strength (D 790), psi.		9,500, av.
Modulus of Elasticity in Flexure (D 790), psi.		10×10^5, av.
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil		315, av.
Volume Resistivity (D 257), ohm-cm.		20×10^{11}, av.
	60Hz	1MHz
Dielectric Constant (D 150)	6.2, av.	4.8, av.
Dissipation Factor (D 150)	0.11, av.	0.04, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)		1.32-1.36
Deflection Temp. at 264 psi. (D 648), °F.		325, av.
Water Absorption, gain in weight (D 570), per cent		0.45, av.
Rockwell Hardness, "E" Scale		92, av.

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December, 1973
F-41877B

A1+073

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BAKELITE

PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMM-5498 Black-25 DC General Purpose

DESCRIPTION

BMM-5498 Black-25 DC is a general purpose, dust-controlled, two-step phenolic molding material. Wide molding latitude, relatively fast cure, and balanced properties make BMM-5498 Black-25 DC suitable for a wide variety of applications. Normal general purpose molding conditions are satisfactory; however, if maximum electrical properties are desired, prewarming is recommended.

BMM-5498 Black-25 DC meets MIL-C-13428 and ASTM D 700, Type 2.

PROPERTIES	TYPICAL VALUES	
FABRICATION		
Plasticity Grades Available	9,12,15,18	
Bulk Factor (D 392)	2.4, max.	
Molding Shrinkage (D 955), inch/inch	0.003-0.006	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.31, av.	
Compressive Strength (D 695), psi	30,600, av.	
Tensile Strength (D 651), psi	7,300, av.	
Flexural Strength (D 790), psi	9,500, av.	
Modulus of Elasticity in Flexure	10×10^6, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	315, av.	
Volume Resistivity (D 257), ohm-cm.	20×10^{11}, av.	
	60Hz	1MHz
Dielectric Constant (D 150)	6.2, av.	4.8, av.
Dissipation Factor (D 150)	0.11, av.	0.04, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.32-1.36	
Deflection Temp. at 264 psi (D 648), °F.	325, av.	
Water Absorption, gain in weight (D 570), per cent	0.45, av.	
Rockwell Hardness, "E" Scale	92, av.	

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December, 1973
F-41709B

A 14374

BAKELITE

PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMM-7002
Black-25 DC
General Purpose

DESCRIPTION

BMM-7002 Black-25 DC is a general purpose, two-step, woodflour filled, molding material possessing an unusual combination of properties; it is fast curing, has a wide molding latitude, and is low in fines content. This material is used extensively for plunger molded parts where radio frequency preheated preforms are required. BMM-7002 Black-25 DC is also well suited for fast cure compression molding, both automatic and semi-automatic. Molded parts are rigid on discharge from the mold, have high surface gloss, and excellent strength properties.

BMM-7002 Black-25 DC meets the requirements of ASTM Specification D 700, Type 2.

PROPERTIES

	TYPICAL VALUES
FABRICATION	
Plasticity Grades Available	9,12,15
Bulk Factor (D 392)	2.4, max.
Molding Shrinkage (D 955), inch/inch	0.003-0.006
MECHANICAL	
Izod Impact Strength (D 256), ft.-lb./in. notch	0.31, av.
Compressive Strength (D 695), psi.	30,600, av.
Tensile Strength (D 651), psi.	7,300, av.
Flexural Strength (D 790), psi.	9,500, av.
Modulus of Elasticity in Flexure (D 790), psi.	10×10^5, av.
ELECTRICAL	
Dielectric Strength, Short Time (D 149), volts/mil.	315, av.
Volume Resistivity (D 257), ohm-cm.	20×10^{11}, av.

	60Hz	1MHz
Dielectric Constant (D 150)	6.2, av.	4.8, av.
Dissipation Factor (D 150)	0.11, av.	0.04, av.

MISCELLANEOUS	
Molded Specific Gravity (D 792)	1.32-1.36
Deflection Temp. at 264 psi., °F	325, av.
Water Absorption, gain in weight (D 570), per cent.	0.45, av.
Rockwell Hardness, "E" Scale	92, av.

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December, 1973
F-41882B

A 14975

BAKELITE® PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMMC-2035 Black-25 Heat Resistant

DESCRIPTION

BMMC-2035 Black-25 is a one-step* mineral-filled phenolic material recommended for iron handles and other appliance parts requiring a combination of heat resistance and good wet/dry performance.

BMMC-2035 Black-25 meets ASTM Specification D 700, Type 13.

PROPERTIES

FABRICATION	
Plasticity Grades Available	15
Bulk Factor (D 392)	2.4, max.
Molding Shrinkage (D 955), inch/inch	0.0045
MECHANICAL	
Izod Impact Strength (D 256), ft.-lb./in. notch	0.36
Compressive Strength (D 695), psi.	28,000
Tensile Strength (D 651), psi.	6,000
Flexural Strength (D 790), psi.	7,500
Modulus of Elasticity in Flexure	10×10^5
ELECTRICAL	
Dielectric Strength, Short Time (D 149), volts/mil	340
Volume Resistivity (D 257), ohm-cm.	5×10^{13}

	60Hz	1MHz
Dielectric Constant (D 150)	10	6
Dissipation Factor (D 150)	0.15	0.06
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.48–1.52	
Deflection Temp. at 264 psi, (D 648), °F.	340	
Water Absorption, gain in weight (D 570), per cent	0.40	

** To maintain rated plasticity at time of manufacture one-step phenolic materials should not be stored longer than three months, unless under refrigeration.*

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November, 1971

F-43644

A-14373

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMRS-2035
Black-25 DC
Heat Resistant

DESCRIPTION

BMRS-2035 Black-25 DC is a one-step* mineral-filled phenolic material recommended for iron handles and other appliance parts requiring a combination of heat resistance and good wet/dry performance.

BMRS-2035 Black-25 DC meets ASTM Specification D 700, Type 13.

PROPERTIES:

All tests on specimens injection molded from unconditioned material. For critical electrical applications, the material should be preconditioned.

FABRICATION	
Plasticity Grades Available	18
Bulk Factor (D 392)	2.4, max.
Molding Shrinkage (D 955), inch/inch	0.004-0.006 parallel 0.005-0.007 perpendicular
MECHANICAL	
Izod Impact Strength (D 256), ft.-lb./in. notch	0.38
Compressive Strength (D 695), psi	29,000
Tensile Strength (D 651), psi	7,500
Flexural Strength (D 790), psi	11,500
Modulus of Elasticity in Flexure	14×10^5
ELECTRICAL	
Dielectric Strength, Short Time (D 149), volts/mil	340
Volume Resistivity (D 257), ohm-cm	5×10^{13}

	60Hz	1MHz
Dielectric Constant (D 150)	12	7
Dissipation Factor (D 150)	0.30	0.07

MISCELLANEOUS	
Molded Specific Gravity (D 792)	1.48–1.52
Deflection Temp. at 264 psi. (D 648), °F	350
Water Absorption, gain in weight (D 570), per cent	0.30

** To maintain rated plasticity at time of manufacture one-step phenolic materials should not be stored longer than three months, unless under refrigeration.*

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November, 1971
F-43625

A 14377

BAKELITE

PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMM-5303
Black-25 DC
Heat Resistant

DESCRIPTION

BMM-5303 Black-25 DC is a low-dust, two-step material formulated for appliance and electrical insulation parts requiring heat resistance and good dimensional stability. It is especially recommended for mechanical-automotive applications.

BMM-5303 Black-25 DC has been granted UL "Yellow Card" component recognition for use at temperatures not exceeding 150°C. in thicknesses no less than 1/16-inch. It also has an SE-0 flammability rating and an arc resistance rating of 180 seconds.

BMM-5303 Black-25 DC will meet the requirements of ASTM Specification D 700 for Type 13.

PROPERTIES

	TYPICAL VALUES	
FABRICATION		
Plasticity Grades Available	9,12	
Bulk Factor (D 392)	2.5, max.	
Molding Shrinkage (D 955), inch/inch	0.002-0.004	
MECHANICAL		
Izod Impact Strength (D 256), ft.lb./in. notch	0.33, min.	
Compressive Strength (D 695), psi.	29,500, av.	
Tensile Strength (D 651), psi.	6,600, av.	
Flexural Strength (D 790), psi.	8,600, av.	
Modulus of Elasticity in Flexure	14×10^5, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	360, min.	
Volume Resistivity (D 257), ohm-cm.	30×10^{11}	
Arc Resistance (D 495), seconds	180	
	60Hz	**1MHz**
Dielectric Constant (D 150)	9.2	5.1
Dissipation Factor (D 150)	0.2	0.04
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.56-1.60	
Deflection Temp. at 264 psi. (D 648), °F.	330, av.	
Water Absorption, gain in weight (D 570), per cent	0.17, max.	
Rockwell Hardness, "E" Scale	88, av.	

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December, 1973
F-41713B

A14978

BAKELITE

UNION CARBIDE

PHENOLIC MOLDING MATERIALS

BMRS-5303 Black-25 DC Heat Resistant

DESCRIPTION

BMRS-5303 Black-25 DC is a completely reformulated injection molding grade of the two-step heat resistant type. Has excellent heat resistance coupled with superior dimensional stability at a medium molded density. Also has good barrel life and fast cures. Particularly recommended for under-the-hood automotive parts and appliance parts.

BMRS-5303 Black-25 DC has been granted UL "Yellow Card" component recognition for use at temperatures not exceeding 150°C. in thicknesses no less than 1/16-inch. It also has an SE-0 flammability rating and an arc resistance rating of 180 seconds.

BMRS-5303 Black-25 DC will meet the requirements of ASTM Specification D 700 for Type 13.

PROPERTIES:

All tests on specimens injection molded from unconditioned material. For critical electrical applications, the material should be preconditioned.

	TYPICAL VALUES
FABRICATION	
Plasticity Grades Available	15,18,21
Bulk Factor (D 392)	2.5, max.
Molding Shrinkage (D 955), inch/inch	
perpendicular to gate	0.002-0.005
parallel to gate	0.002-0.005
MECHANICAL	
Izod Impact Strength (D 256), ft.-lb./in. notch	0.33, av.
Compressive Strength (D 695), psi.	31,500
Tensile Strength (D 651), psi.	7,700
Flexural Strength (D 790), psi.	12,700
Modulus of Elasticity in Flexure	1.3×10^6
ELECTRICAL	
Dielectric Strength, Short Time (D 149), volts/mil	280, av.
Volume Resistivity (D 257), ohm-cm.	2.5×10^{16}

	60Hz	1MHz
Dielectric Constant (D 150)	15.4, av.	5.0, av.
Dissipation Factor (D 150)	0.6, av.	0.08, av.

MISCELLANEOUS	
Molded Specific Gravity (D 792)	1.45-1.50
Deflection Temp. at 264 psi. (D 648), °F.	360, av.
Water Absorption, gain in weight (D 570), per cent	0.23
Rockwell Hardness, "E" Scale	86, av.

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December, 1973
F-426768

A 7493

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMM-5303 Black-25 DC Heat Resistant

DESCRIPTION

BMM-5303 Black-25 DC is a low-dust, two-step material formulated for appliance and electrical insulation parts requiring heat resistance and good dimensional stability. It is especially recommended for mechanical automotive applications.

BMM-5303 Black-25 DC has been granted UL "Yellow Card" component recognition for use at temperatures not exceeding 150°C. in thicknesses no less than 1/16-inch. It also has an SE-0 flammability rating and an arc resistance rating of 180 seconds.

BMM-5303 Black-25 DC will meet the requirements of ASTM Specification D 700 for Type 13.

PROPERTIES	TYPICAL VALUES	
FABRICATION		
Plasticity Grades Available	9,12	
Bulk Factor (D 392)	2.5, max.	
Molding Shrinkage (D 955), inch/inch	0.002-0.004	
MECHANICAL		
Izod Impact Strength (D 256), ft.lb./in. notch	0.33, min.	
Compressive Strength (D 695), psi.	29,500, av.	
Tensile Strength (D 651), psi.	6,600, av.	
Flexural Strength (D 790), psi.	8,600, av.	
Modulus of Elasticity in Flexure	14×10^5, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	360, min.	
Volume Resistivity (D 257), ohm-cm.	30×10^{11}	
Arc Resistance (D 495), seconds	180	
	60Hz	1MHz
Dielectric Constant (D 150)	9.2	5.1
Dissipation Factor (D 150)	0.2	0.04
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.56-1.60	
Deflection Temp. at 264 psi. (D 648), °F.	330, av.	
Water Absorption, gain in weight (D 570), per cent	0.17, max.	
Rockwell Hardness, "E" Scale	88, av.	

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December, 1973
F-41713B

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMG-2080 Black-25 Improved Impact

DESCRIPTION

BMG-2080 Black-25 is a one-step* phenolic molding material with improved impact strength and good resistance to water and to solutions of soaps and detergents even at elevated temperatures and in situations where wet exposure is only on one side (such as in pump housings, for example). These properties make BMG-2080 Black-25 particularly suitable for parts to be used in pumps and vaporizers. Other applications for this material include housings and casings for appliances as well as moving mechanical components.

BMG-2080 Black-25 meets the requirements of ASTM Specification D 700 for Type 12.

PROPERTIES

FABRICATION		
Plasticity Grades Available		12,15
Bulk Factor (D 392)		2.8, max.
Molding Shrinkage (D 955), inch/inch		0.005-0.007
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch		0.46 min.
Compressive Strength (D 695), psi.		27,000, av.
Tensile Strength (D 651), psi.		7,600, av.
Flexural Strength (D 790), psi.		10,000, av.
Modulus of Elasticity in Flexure (D 790), psi.		8×10^5
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil		270, av.
Volume Resistivity (D 257), ohm-cm.		3×10^{12}, av.
	60Hz	**1MHz**
Dielectric Constant (D 150)	11, av.	6, av.
Dissipation Factor (D 150)	0.20, av.	0.05, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)		1.35-1.38
Deflection Temp. at 264 psi. (D 648), °F.		310, av.
Water Absorption, gain in weight (D 570), per cent		0.4, av.

**To maintain rated plasticity at the time of manufacture, one-step phenolic materials should not be stored longer than three month, unless under refrigeration.*

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November, 1971
F-41897A

A14891

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMRA-2085 Black-25 Improved Impact

DESCRIPTION

BMRA-2085 Black-25 is a one-step* phenolic molding material with improved impact strength and good resistance to water and to solutions of soaps and detergents. It is recommended for use in housing, cases, and appliance parts, particularly where parts are dry on one side and wet on the other.

PROPERTIES

FABRICATION		
Plasticity Grades Available	18	
Bulk Factor (D 392)	2.8, max.	
Molding Shrinkage (D 955), inch/inch	0.004–0.006	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.46, min.	
Compressive Strength (D 695), psi.	27,000, av.	
Tensile Strength (D 651), psi.	6,500, av.	
Flexural Strength (D 790), psi.	9,500, av.	
Modulus of Elasticity in Flexure	10×10^5, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	290, av.	
Volume Resistivity (D 257), ohm-cm.	5×10^{11}, av.	
	60Hz	1MHz
Dielectric Constant (D 150) (av.)	11	5
Dissipation Factor (D 150) (av.)	0.3	0.06
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.37 – 1.39	
Deflection Temp. at 264 psi. (D 648), °F.	345, av.	
Water Absorption, gain in weight (D 570), per cent	0.40, av.	

**To maintain rated plasticity at time of manufacture, one-step phenolic materials should not be stored longer than three months, unless under refrigeration.*

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November, 1971
F-41706C

A 14832

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMRS-2085
Black-25
Improved Impact

DESCRIPTION

BMRS-2085 Black-25 is a one-step* phenolic injection molding material with improved impact strength and good resistance to water and to solutions of soaps and detergents. It is recommended for use in housing, cases and appliance parts, particularly where parts are dry on one side and wet on the other.

PROPERTIES:

All tests on specimens injection molded from unconditioned material. For critical electrical applications, the material should be preconditioned.

FABRICATION		
Plasticity Grades Available	18	
Bulk Factor (D 392)	2.8, max.	
Molding Shrinkage (D 955), inch/inch	0.004, av.	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.42, av.	
Compressive Strength (D 695), psi.	29,000, av.	
Tensile Strength (D 651), psi.	8,000, av.	
Flexural Strength (D 790), psi.	11,500, av.	
Modulus of Elasticity in Flexure	10×10^5, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil	290, av.	
Volume Resistivity (D 257), ohm-cm.	1×10^{16}, av.	
	60Hz	**1MHz**
Dielectric Constant (D 150) (av.)	13.5	6
Dissipation Factor (D 150) (av.)	0.50	0.06
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.37 – 1.39	
Deflection Temp. at 264 psi. (D 648), °F.	400, av.	
Water Absorption, gain in weight (D 570), per cent	0.50, av.	

*To maintain rated plasticity at time of manufacture, one-step phenolic materials should not be stored longer than three months, unless under refrigeration.

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November, 1971
F-43636

A 14383

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMMB-7021 Black-25 Improved Impact

DESCRIPTION

BMMB-7021 Black-25 is a two-step phenolic molding material with medium-high impact strength formulated for compression and plunger molding. Powder pourability and flow are excellent for a material of this type so BMMB-7021 Black-25 performs well in automatic molding machines. It also cures rapidly and attains high hot rigidity. BMMB-7021 Black-25 is recommended particularly for switch gear requiring greater impact strength than can be obtained with BMMA-7026

PROPERTIES:

FABRICATION	
Plasticity Grades Available	12, 15
Bulk Factor (D 392)	2.8
Molding Shrinkage (D 955), inch/inch	0.005
MECHANICAL	
Izod Impact Strength (D 256), ft.-lb./in. notch	0.50, min.
Compressive Strength (D 695), psi.	27,000
Tensile Strength (D 651), psi.	7,000
Flexural Strength (D 790), psi.	8,500
Modulus of Elasticity in Flexure	10×10^5
ELECTRICAL	
Dielectric Strength, Short Time (D 149), volts/mil	330
Volume Resistivity (D 257), ohm-cm.	3.5×10^{10}

	60Hz	1MHz
Dielectric Constant (D 150)	9.5	5.2
Dissipation Factor (D 150)	0.40	0.05

MISCELLANEOUS	
Molded Specific Gravity (D 792)	1.35–1.39
Deflection Temp. at 264 psi. (D 648), °F.	340
Water Absorption, gain in weight (D 570), per cent	0.9, max.

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November, 1971
F-43631

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BAKELITE

PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMRS-7021
Black-25 DC
Improved Impact

DESCRIPTION

BMRS-7021 Black-25 DC is a specially formulated injection molding grade of the two-step, medium-high-impact type. Has excellent pourability and material flow in injection machine hoppers for a material with 0.5 ft.-lb. impact strength. Fast cures lead to high hot rigidity. Recommended for switchgear parts requiring better impact strength than BMMS-7026.

PROPERTIES:

All tests on specimens injection molded from unconditioned material. For critical electrical applications, the material should be preconditioned.

FABRICATION	
Plasticity Grades Available	15, 18, 21
Bulk Factor (D 392)	2.5, max.
Molding Shrinkage (D 955), inch/inch	
perpendicular to gate	0.0035
parallel to gate	0.0065
MECHANICAL	
Izod Impact Strength (D 256), ft.-lb./in. notch	0.50 (a)
Compressive Strength (D 695), psi.	33,500
Tensile Strength (D 651), psi.	5,980
Flexural Strength (D 790), psi.	10,800
Modulus of Elasticity in Flexure	0.98×10^6
ELECTRICAL	
Dielectric Strength, Short Time (D 149), volts/mil	187
Volume Resistivity (D 257), ohm-cm.	0.6×10^{10}

	60Hz	1MHz
Dielectric Constant (D 150)	–	6.0
Dissipation Factor (D 150)	–	0.07
MISCELLANEOUS		
Molded Specific Gravity (D 792)		1.35–1.38
Deflection Temp. at 264 psi. (D 648), °F.		342
Water Absorption, gain in weight (D 570), per cent		0.76

(a) Varies with design of part and gate used.

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November, 1971
F-42674A

BAKELITE® PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMG-0750
Natural
Electrical

DESCRIPTION

BMG-0750 Natural is a mineral-filled phenolic molding material of superior electrical insulating quality. Low dissipation factor and low loss factor recommend it particularly for high frequency insulation. BMG-0750 Natural is highly resistant to moisture and retains much of its superior electrical insulating quality even after exposure to moisture. It is also dimensionally stable. Good plastic and cure characteristics and improved mold release make BMG-0750 Natural suitable for either compression or transfer molding.

BMG-0750 Natural meets the requirements of Military Specification MIL-M-14F, Type MFE and ASTM Specification D 700, Type 7.

FABRICATION		
Plasticity Grades Available	6,9,12,15	
Bulk Factor (D 392)	2.4, max.	
Molding Shrinkage (D 955), inch/inch	0.003-0.005	
MECHANICAL		
Izod Impact Strength (D 256), ft.-lb./in. notch	0.35, av.	
Compressive Strength (D 695), psi.	28,000, av.	
Tensile Strength (D 651), psi.	6,600, av.	
Flexural Strength (D 790), psi.	8,700, av.	
Modulus of Elasticity in Flexure (D 790), psi.	2×10^6, av.	
ELECTRICAL		
Dielectric Strength, Short Time (D 149), volts/mil.	370, av.	
Volume Resistivity (D 257), ohm-cm.	1.0×10^{14}, av.	
	60Hz	**1MHz**
Dielectric Constant (D 150)	5.0, av.	4.5, av.
Dissipation Factor (D 150)	0.03, av.	0.015, av.
MISCELLANEOUS		
Molded Specific Gravity (D 792)	1.65-1.70	
Deflection Temp. at 264 psi. (D 648), °F.	310, av.	
Water Absorption, gain in weight (D 570), per cent	0.03, av.	

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November, 1971
F-41907A

A14383

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMGS-0750 Natural Electrical

DESCRIPTION

BMGS-0750 Natural Electrical is a specially modified injection molding grade of the mineral-filled electrical type. Has fair injection molding characteristics, but excellent molded electrical properties, and superior retention of insulating properties after outdoor exposure. Low loss factor at high frequencies recommends BMGS-0750 natural for high frequency electronic insulation.

PROPERTIES:

All tests on specimens injection molded from unconditioned material. For critical electrical applications, the material should be preconditioned.

FABRICATION	
Plasticity Grades Available	15, 18, 21
Bulk Factor (D 392)	2.4, max.
Molding Shrinkage (D 955), inch/inch	
perpendicular to gate	0.0035
parallel to gate	0.0040
MECHANICAL	
Izod Impact Strength (D 256), ft.-lb./in. notch	0.33
Compressive Strength (D 695), psi.	24,700
Tensile Strength (D 651), psi.	5,200
Flexural Strength (D 790), psi.	10,800
Modulus of Elasticity in Flexure	2.1×10^6
ELECTRICAL	
Dielectric Strength, Short Time (D 149), volts/mil	395
Volume Resistivity (D 257), ohm-cm.	0.59×10^{17}

	60Hz	1MHz
Dielectric Constant (D 150)	5.7	4.1
Dissipation Factor (D 150)	0.06	0.02

MISCELLANEOUS	
Molded Specific Gravity (D 792)	1.65 – 1.70
Deflection Temp. at 264 psi. (D 648), °F.	270
Water Absorption, gain in weight (D 570), per cent	0.035

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November, 1971
F-42671A

#14887

BAKELITE PHENOLIC MOLDING MATERIALS

UNION CARBIDE

BMGA-3700
Green-155
Electrical

DESCRIPTION

BMGA-3700 Green-155 is a specially formulated electrical material which displays exceptional arc resistance, excellent heat resistance combined with good moldability and improved mechanical strength. Parts molded from it show outstanding dimensional stability under severe temperature and humidity cycling. BMGA-3700 Green-155 is suitable for compression and transfer molding, and is recommended where high voltage arcs are encountered.

PROPERTIES

FABRICATION	
Plasticity Grades Available	12, 16
Bulk Factor (D 392)	2.44
Molding Shrinkage (D 955), inch/inch	0.002
MECHANICAL	
Izod Impact Strength (D 256), ft.-lb./in. notch	0.32 min.
Compressive Strength (D 695), psi	31,700
Tensile Strength (D 651), psi	7,418
Flexural Strength (D 790), psi	9,595
Modulus of Elasticity in Flexure (D 790), psi	2.28×10^6
ELECTRICAL	
Dielectric Strength, Short Time (D 149), volts/mil	404
Volume Resistivity (D 257), ohm-cm	0.083075

	60Hz	1MHz
Dielectric Constant (D 159)	7.21	4.88
Dissipation Factor (D 150)	–	–
Arc Resistance (D 495), seconds	180	

MISCELLANEOUS	
Molded Specific Gravity (D 792)	1.75
Deflection Temp. at 264 psi., °F.	330
Water Absorption, gain in weight (D 570), per cent	0.087

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November, 1971
F-43624

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TEMPERATURE CONVERSION TABLES

Look up the temperature you wish to convert, whether Centigrade or Fahrenheit, in the bold face column. Then refer to the left column for changing °F. to °C., or to the right column for changing °C. to °F.

C.		F.	C.		F.	C.		F.
−17.8	0	32	6.11	43	109.4	30.0	86	186.8
−17.2	1	33.8	6.67	44	111.2	30.6	87	188.6
−16.7	2	35.6	7.22	45	113.0	31.1	88	190.4
−16.1	3	37.4	7.78	46	114.8	31.7	89	192.2
−15.6	4	39.2	8.33	47	116.6	32.2	90	194.0
−15.0	5	41.0	8.89	48	118.4	32.8	91	195.8
−14.4	6	42.8	9.44	49	120.2	33.3	92	197.6
−13.9	7	44.6	10.0	50	122.0	33.9	93	199.4
−13.3	8	46.4	10.6	51	123.8	34.4	94	201.2
−12.8	9	48.2	11.1	52	125.6	35.0	95	203.0
−12.2	10	50.0	11.7	53	127.4	35.6	96	204.8
−11.7	11	51.8	12.2	54	129.2	36.1	97	206.6
−11.1	12	53.6	12.8	55	131.0	36.7	98	208.4
−10.6	13	55.4	13.3	56	132.8	37.2	99	210.2
−10.0	14	57.2	13.9	57	134.6	37.8	100	212.0
− 9.44	15	59.0	14.4	58	136.4	43	110	230
− 8.89	16	60.8	15.0	59	138.2	49	120	248
− 8.33	17	62.6	15.6	60	140.0	54	130	266
− 7.78	18	64.4	16.1	61	141.8	60	140	284
− 7.22	19	66.2	16.7	62	143.6	66	150	302
− 6.67	20	68.0	17.2	63	145.4	71	160	320
− 6.11	21	69.8	17.8	64	147.2	77	170	338
− 5.56	22	71.6	18.3	65	149.0	82	180	356
− 5.00	23	73.4	18.9	66	150.8	88	190	374
− 4.44	24	75.2	19.4	67	152.6	93	200	392
− 3.89	25	77.0	20.0	68	154.4	99	210	410
− 3.33	26	78.8	20.6	69	156.2	100	212	413
− 2.78	27	80.6	21.1	70	158.0	104	220	428
− 2.22	28	82.4	21.7	71	159.8	110	230	446
− 1.67	29	84.2	22.2	72	161.6	116	240	464
− 1.11	30	86.0	22.8	73	163.4	121	250	482
− 0.56	31	87.8	23.3	74	165.2	127	260	500
0	32	89.6	23.9	75	167.0	132	270	518
0.56	33	91.4	24.4	76	168.8	138	280	536
1.11	34	93.2	25.0	77	170.6	143	290	554
1.67	35	95.0	25.6	78	172.4	149	300	572
2.22	36	96.8	26.1	79	174.2	154	310	590
2.78	37	98.6	26.7	80	176.0	160	320	608
3.33	38	100.4	27.2	81	177.8	166	330	626
3.89	39	102.2	27.8	82	179.6	171	340	644
4.44	40	104.0	28.3	83	181.4	177	350	662
5.00	41	105.8	28.9	84	183.2	182	360	680
5.56	42	107.6	29.4	85	185.0	188	370	698

To change Fahrenheit to Centigrade: °C. = 5/9 (F.° − 32)

To change Centigrade to Fahrenheit: °F. = 9/5 °C + 32

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TEMPERATURE CONVERSION TABLES – (Continued)

C.		F.	C.		F.	C.		F.
193	380	716	493	920	1688	793	1460	2660
199	390	734	499	930	1706	799	1470	2678
204	400	752	504	940	1724	804	1480	2696
210	410	770	510	950	1742	810	1490	2714
216	420	788	516	960	1760	816	1500	2732
221	430	806	521	970	1778	821	1510	2750
227	440	824	527	980	1796	827	1520	2768
232	450	842	532	990	1814	832	1530	2786
238	460	860	538	1000	1832	838	1540	2804
243	470	878	543	1010	1850	843	1550	2822
249	480	896	549	1020	1868	849	1560	2840
254	490	914	554	1030	1886	854	1570	2858
260	500	932	560	1040	1904	860	1580	2876
266	510	950	566	1050	1922	866	1590	2894
271	520	968	571	1060	1940	871	1600	2912
277	530	986	577	1070	1958	877	1610	2930
282	540	1004	582	1080	1976	882	1620	2948
288	550	1022	588	1090	1994	888	1630	2966
293	560	1040	593	1100	2012	893	1640	2984
299	570	1058	599	1110	2030	899	1650	3002
304	580	1076	604	1120	2048	904	1660	3020
310	590	1094	610	1130	2066	910	1670	3038
316	600	1112	616	1140	2084	916	1680	3056
321	610	1130	621	1150	2102	921	1690	3074
327	620	1148	627	1160	2120	927	1700	3092
332	630	1166	632	1170	2138	932	1710	3110
338	640	1184	638	1180	2156	938	1720	3128
343	650	1202	643	1190	2174	943	1730	3146
349	660	1220	649	1200	2192	949	1740	3164
354	670	1238	654	1210	2210	954	1750	3182
360	680	1256	660	1220	2228	960	1760	3200
366	690	1274	666	1230	2246	966	1770	3218
371	700	1292	671	1240	2264	971	1780	3236
377	710	1310	677	1250	2282	977	1790	3254
382	720	1328	682	1260	2300	982	1800	3272
388	730	1346	688	1270	2318	988	1810	3290
393	740	1364	693	1280	2336	993	1820	3308
399	750	1382	699	1290	2354	999	1830	3326
404	760	1400	704	1300	2372	1004	1840	3344
410	770	1418	710	1310	2390	1010	1850	3362
416	780	1436	716	1320	2408	1016	1860	3380
421	790	1454	721	1330	2426	1021	1870	3398
427	800	1472	727	1340	2444	1027	1880	3416
432	810	1490	732	1350	2462	1032	1890	3434
438	820	1508	738	1360	2480	1038	1900	3452
443	830	1526	743	1370	2498	1043	1910	3470
449	840	1544	749	1380	2516	1049	1920	3488
454	850	1562	754	1390	2534	1054	1930	3506
460	860	1580	760	1400	2552	1060	1940	3524
466	870	1598	766	1410	2570	1066	1950	3542
471	880	1616	771	1420	2588	1071	1960	3560
477	890	1634	777	1430	2606	1077	1970	3578
482	900	1652	782	1440	2624	1082	1980	3596
488	910	1670	788	1450	2642	1088	1990	3614
						1093	2000	3632

A14930

STEAM TABLE

Based on gauge pressure at sea level.
Absolute pressure equals gauge pressure plus barometric pressure.

GAUGE PRESSURE, LB./SQ. IN.	TEMPERATURE °F.	TEMPERATURE °C.	GAUGE PRESSURE, LB./SQ. IN.	TEMPERATURE °F.	TEMPERATURE °C.
0	212.0	100.0	51	298.6	148.1
1	215.3	101.8	52	299.6	148.7
2	218.2	103.5	53	300.6	149.2
3	221.5	105.3	54	301.6	149.8
4	224.3	106.9	55	302.5	150.3
5	227.1	108.4	56	303.5	150.8
6	229.8	109.9	57	304.4	151.3
7	232.3	111.3	58	305.4	151.9
8	234.8	112.6	59	306.3	152.4
9	237.1	113.9	60	307.2	152.9
10	239.4	115.2	61	308.1	153.4
11	241.5	116.4	62	309.0	153.9
12	243.7	117.6	63	309.9	154.4
13	245.8	118.8	64	310.8	154.9
14	247.8	119.9	65	311.6	155.4
15	249.7	121.0	66	312.5	155.8
16	251.6	122.0	67	313.3	156.3
17	253.4	123.0	68	314.2	156.8
18	255.2	124.0	69	315.0	157.2
19	257.0	125.0	70	315.9	157.7
20	258.7	126.0	71	316.7	158.2
21	260.4	126.9	72	317.6	158.6
22	262.0	127.8	73	318.4	159.1
23	263.6	128.7	74	319.2	159.5
24	265.2	129.6	75	320.0	160.0
25	266.7	130.4	76	320.7	160.4
26	268.2	131.2	77	321.5	160.8
27	269.7	132.1	78	322.2	161.2
28	271.2	132.9	79	323.0	161.7
29	272.6	133.7	80	323.8	162.1
30	273.9	134.4	81	324.6	162.5
31	275.3	135.2	82	325.3	163.0
32	276.6	135.9	83	326.1	163.4
33	278.0	136.7	84	326.8	163.8
34	279.3	137.4	85	327.5	164.2
35	280.5	138.1	86	328.2	164.6
36	281.8	138.8	87	328.9	164.9
37	283.0	139.5	88	329.6	165.3
38	284.2	140.1	89	330.3	165.7
39	285.4	140.8	90	331.0	166.1
40	286.6	141.5	91	331.7	166.5
41	287.8	142.1	92	332.4	166.9
42	289.0	142.8	93	333.1	167.3
43	290.1	143.4	94	333.8	167.7
44	291.2	144.0	95	334.5	168.1
45	292.3	144.6	96	335.2	168.4
46	293.4	145.2	97	335.8	168.8
47	294.5	145.8	98	336.5	169.2
48	295.5	146.4	99	337.1	169.5
49	296.5	146.9	100	337.8	169.9
50	297.5	147.5			

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STEAM TABLE – (Continued)

GAUGE PRESSURE, LB./SQ. IN.	TEMPERATURE °F.	°C.	GAUGE PRESSURE, LB./SQ. IN.	TEMPERATURE °F.	°C.
101	338.4	170.2	151	366.3	185.7
102	339.0	170.6	152	366.8	186.0
103	339.7	170.9	153	367.3	186.3
104	340.3	171.3	154	367.8	186.5
105	340.9	171.6	155	368.3	186.8
106	341.5	172.0	156	368.7	187.1
107	342.1	172.3	157	369.2	187.3
108	342.8	172.7	158	369.6	187.6
109	343.4	173.0	159	370.1	187.8
110	344.0	173.3	160	370.6	188.1
111	344.6	173.7	161	371.0	188.3
112	345.2	174.0	162	371.5	188.6
113	345.8	174.3	163	371.9	188.9
114	346.4	174.7	164	372.4	189.1
115	347.0	175.0	165	372.9	189.4
116	347.6	175.3	166	373.3	189.6
117	348.2	175.7	167	373.8	189.9
118	348.8	176.0	168	374.2	190.1
119	349.3	176.3	169	374.7	190.4
120	349.9	176.6	170	375.2	190.6
121	350.5	176.9	171	375.6	190.9
122	351.1	177.3	172	376.0	191.2
123	351.7	177.6	173	376.5	191.4
124	352.2	177.9	174	376.9	191.6
125	352.8	178.2	175	377.4	191.9
126	353.4	178.5	176	377.8	192.1
127	353.9	178.8	177	378.2	192.4
128	354.5	179.1	178	378.7	192.6
129	355.0	179.4	179	379.1	192.9
130	355.5	179.7	180	379.6	193.1
131	356.1	180.0	181	380.0	193.3
132	356.6	180.3	182	380.4	193.6
133	357.2	180.6	183	380.8	193.8
134	357.7	180.9	184	381.2	194.0
135	358.2	181.2	185	381.7	194.3
136	358.8	181.5	186	382.1	194.5
137	359.3	181.8	187	382.5	194.7
138	359.8	182.1	188	382.9	195.0
139	360.3	182.4	189	383.3	195.2
140	360.8	182.7	190	383.8	195.4
141	361.3	183.0	191	384.2	195.7
142	361.8	183.3	192	384.6	195.9
143	362.3	183.5	193	385.0	196.1
144	362.8	183.8	194	385.2	196.3
145	363.3	184.1	195	385.9	196.6
146	363.8	184.4	196	386.3	196.8
147	364.3	184.5	197	386.7	197.0
148	364.8	184.9	198	387.1	197.3
149	365.3	185.2	199	387.5	197.5
150	365.8	185.5	200	387.9	197.7

A 14302

TROUBLE SHOOTING CHECKLIST

The following is a list of commonly encountered defects in the appearance or properties of molded thermosets. Using one or more of the suggested remedies can often effect dramatic improvements.

DEFECT: BLISTERING, HEAVY SECTION

REMEDY

1. Increase cure.
2. Close mold slowly on low pressure, then apply high pressure to purge trapped gas.
3. Vent mold if plunger molding.
4. Preheat to eliminate moisture. If R.F. preheating, increase preform temperature.
5. Breathe mold – between low pressure close and applying high pressure – always breathe as soon as possible.
6. Increase pressure.
7. Use stiff material.
8. Lower mold temperature.
9. Check mold temperature for uniformity.
10. Vent mold at dead ends with vent pins.

DEFECT: POROSITY (not filled out in every section)

REMEDY

1. Try a range of plasticities to determine best grade.
2. Increase pressure.
3. Lower mold temperature.
4. Close mold faster if external porosity, apply high pressure sooner. Close mold slower if internal porosity, apply low pressure longer.
5. Preheat material.
6. Adjust charge weight
7. Try a higher density material to obtain greater "back pressure" in the mold.
8. Breathe mold earlier, before closed, if breathe cycle is used.
9. Use semi-positive molds to minimize porosity.

DEFECT: PIECE FLEXIBLE AT DISCHARGE

REMEDY

1. Increase cure.
2. Raise temperature.
3. Raise pressure.
4. Preheat to eliminate moisture.
5. Use more rigid material.

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A 14803

Union Carbide trial exhibit UC-5307: Union Carbide Chemicals and Plastics, Bakelite Phenolic Molding Materials G...
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DEFECT: MOLD STICKING
REMEDY

1. Raise mold temperature.
2. Preheat to eliminate moisture.
3. Clean mold.
4. Use stiffer material, particularly with one-steps.
5. Remove dents and undercuts in mold cavity and force.
6. Polish mold.
7. Increase cure.
8. Reduce pressure and use softer material if plunger molding.
9. Determine whether knockout pins are properly adjusted for height.
10. Be sure cavities have sufficient draft--1/4" recommended.

DEFECT: DULL SURFACE
REMEDY

1. Adjust mold temperature—usually reduce temperature for better appearance.
2. Polish mold.
3. Chrome plate.
4. Close mold more slowly, longer on low pressure.

DEFECT: ORANGE PEEL (rough surface with extremely pimply surface)
REMEDY

1. Close slowly, on low pressure, delay 2 or 3 sec. before applying high pressure.
2. Preheat (radio frequency).
3. Use stiffer material.
4. Use finer ground material.
5. Use large preforms and few as possible.
6. Use lower mold temperature.

DEFECT: PITTED SURFACE
REMEDY

1. Use stiffer material.
2. Preheat.

DEFECT: CLOUDED OR SEGREGATED SURFACE
REMEDY

1. Reduce molding temperature (for colors, 300 – 310° F.).
2. Preheat preforms.
3. Adjust plasticity.
4. Adjust pressure and closing speed (low and high pressure).

A 14904

Union Carbide trial exhibit UC-5307: Union Carbide Chemicals and Plastics, Bakelite Phenolic Molding Materials G... Published by AsbestosClaims.Law
ACL Doc 19769 · Page 38 of 48 **asbestosclaims.law/library/19769/38**

DEFECT: DIMPLED SURFACE

REMEDY

1. Close slowly, longer on low pressure, no breathe, then high pressure.
2. Use stiffer material.
3. Lower mold temperature.
4. Increase charge weight.
5. Shape preforms more closely to shape of piece.
6. Increase pressure.

DEFECT: WARPED PIECE

REMEDY

1. Heat mold more uniformly.
2. Use stiffer material.
3. Preheat if soft plasticity.
4. Increase cure.
5. Use lower shrinkage material and/or material more rigid at discharge.
6. Redesign mold; use larger diameter knockout pins.
7. Adjust temperature of force and cavity—lower temperature may reduce warpage.
8. Preheat for irregular shaped pieces.
9. Cool uniformly and use shrink fixture—a one-, perhaps 2-dimensional fixture.

DEFECT: CRACKING AFTER MOLDING

REMEDY

1. Increase wall thickness around inserts.
2. Eject evenly, check knockout pins for position and size.
3. Correct size of shrink fixture.
4. Use material with greater flexibility.
5. Increase radii and ribs.
6. Anneal in oven approximately 2 hours at 200°F.

DEFECT: POOR ELECTRICAL PROPERTIES

REMEDY

1. Close slowly.
2. Preheat 1/2 hour at 185°F.
3. Increase cure.
4. Reduce temperature.
5. Use stiffer grade.

A 14305

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DEFECT: WEAK MECHANICALLY

REMEDY

1. Increase temperature.
2. Increase cure.
3. Increase pressure.
4. High frequency preheat.
5. Increase charge.
6. Afterbake to increase strength, if economical. Try 2 hours at 250°F.

DEFECT: PIMPLING

REMEDY

1. Breathe mold, between low and high pressure.
2. Use higher fines content material.
3. Use softer material.
4. R.F. preheat.
5. Lower mold temperature.

DEFECT: BURNED MARKS

REMEDY

1. Reduce radio frequency preheating temperature.
2. Reduce mold temperature.
3. Plunger molding – open gates
   – be sure vents are clear
   – check plunger travel time – should be between 5 and 12 seconds (faster close will entrap gas; slower close will cause burn marks)
4. If possible, avoid or minimize breathing.

DEFECT: THICK FLASH

REMEDY

1. Reduce mold charge–particularly important in semi-positive molds.
2. Reduce mold temperature.
3. Increase high pressure.
4. Close on low pressure, apply high pressure sooner.
5. Eliminate breathe and follow (4).
6. Use softer grade of material if more pressure not available.
7. Be sure of at least 0.002" clearance between force plug and cavity.
8. Be sure overflow grooves in cavity or force are clean.
9. In the case of plunger molds, reduce injection pressure and/or increase clamping pressure.

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UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
270 PARK AVENUE, NEW YORK, N.Y. 10017

GENERAL INFORMATION

Standard Phenolic Molding Materials can be combined for single-Truckload shipments when ordered for a single shipment in the same transportation vehicle. All quantities of a single product of 2,000 pounds or over will be priced at the minimum price for such compounds, but all quantities below 2,000 pounds will be charged at the price applicable to the materials and volumes concerned.

Except where noted, prices are based on shipments made in 50-pound bags, packed 2,000 pounds per pallet, which is the standard base unit. Any quantity of a single product which is a fraction of the base unit will carry the appropriate surcharge. On request, shipments will be made in drums (containing 200 to 325 pounds of material) at an additional charge of two cents per pound and in bulk cartons (containing up to 1,000 pounds of material) at an additional charge of one cent per pound. Orders will be filled to the nearest drum or bulk carton weight or multiples thereof.

Minimum billing for a single shipment is $40.00.

Minimum Truckload quantity is 24,000 pounds. Prices are for material delivered within the continental limits of the United States east of the Rocky Mountains and exclusive of Alaska. For Truckload shipments west of the Rocky Mountains, a two-cents-per pound premium will be charged and four cents for Less-Than-Truckload shipments. Method of shipment at seller's option. If buyer requests method of transportation other than least expensive method, buyer shall reimburse seller for additional transportation expense involved. Prices for special or made-to-order compounds will be quoted on request.

PLEASE DIRECT ORDERS TO: UNION CARBIDE CORPORATION, Chemicals and Plastics, at the nearest Sales Office location given on back page.

Orders emanating from New Mexico, Montana, Wyoming, California, Oregon, Washington, Nevada, Utah, Arizona and Idaho should be directed to: UNION CARBIDE CORPORATION, Chemicals and Plastics, Customer Order Center, 2770 Leonis Boulevard, Los Angeles, California 90058.

REQUESTS FOR TECHNICAL INFORMATION SHOULD BE ADDRESSED TO NEAREST SALES OFFICE.

July 1, 1974
F-43635E

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DESIGNATION	PRICE PER POUND PER SHIPMENT IN STANDARD CONTAINER[1] AGAINST A SINGLE ORDER ($)						Average Specific Gravity	Minimum Material Cost, ¢/Cu. In.
	24,000 lb. and over	10,000 lb. to 23,999 lb.	6,000 lb. to 9,999 lb.	2,000 lb. to 5,999 lb.	1,000 lb. to 1,999 lb.	Standard Container to 99 lb.		
General Purpose								
BMG-5000 Black-25	0.410	0.420	0.425	0.430	0.510	0.560	1.34	1.98
BMM-5000 Black-25 DC	0.410	0.420	0.425	0.430	0.510	0.560	1.34	1.98
BMG-5498 Black-25	0.410	0.420	0.425	0.430	0.510	0.560	1.34	1.98
BMM-5498 Black-25 DC	0.410	0.420	0.425	0.430	0.510	0.560	1.34	1.98
BMMA-5440 Black-25 DC	0.410	0.420	0.425	0.430	0.510	0.560	1.40	2.07
BMRS-5440 Black-25 DC	0.410	0.420	0.425	0.430	0.510	0.560	1.40	2.07
BMMA-5441 Black-25 DC	0.470	0.480	0.485	0.490	0.570	0.620	1.40	2.37
BMRS-5441 Black-25 DC	0.470	0.480	0.485	0.490	0.570	0.620	1.40	2.37
Heat Resistant								
BMM-5303 Black-25 DC	0.440	0.450	0.455	0.460	0.540	0.590	1.58	2.51
BMRS-5303 Black-25 DC	0.440	0.450	0.455	0.460	0.540	0.590	1.47	2.33
BMMC-5333 Black-25 DC	0.440	0.450	0.455	0.460	0.540	0.590	1.40	2.22
BMMS-5333 Black-25 DC	0.440	0.450	0.455	0.460	0.540	0.590	1.40	2.22
BMMA-5353 Black-25 DC	0.440	0.450	0.455	0.460	0.540	0.590	1.58	2.51
BMRS-5353 Black-25 DC	0.440	0.450	0.455	0.460	0.540	0.590	1.53	2.02
BMMA-5440 Black-25 DC	0.410	0.420	0.425	0.430	0.510	0.560	1.40	2.07
BMRS-5440 Black-25 DC	0.410	0.420	0.425	0.430	0.510	0.560	1.40	2.07
Medium Impact								
BMMB-7021 Black-25 DC	0.455	0.465	0.470	0.475	0.555	0.605	1.37	2.25
BMRS-7021 Black-25 DC	0.455	0.465	0.470	0.475	0.555	0.605	1.36	2.23

PRICES SUBJECT TO CHANGE – TERMS: NET CASH DUE TENTH OF MONTH FOLLOWING DATE OF INVOICE

[1] UNLESS OTHERWISE SPECIFIED, STANDARD CONTAINER IS A 50-LB. BAG PACKED 2,000 LB. PER PALLET.

F-43634E

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Union Carbide trial exhibit UC-5307: Union Carbide Chemicals and Plastics, Bakelite Phenolic Molding Materials G...
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July 1, 1974
Page 1 of 1

DESIGNATION	PRICE PER POUND PER SHIPMENT IN STANDARD CONTAINER (1) AGAINST A SINGLE ORDER ($)							Average Specific Gravity		Minimum Material Cost, ¢/Cu. In.
	24,000 lb. and over	10,000 lb. to 23,999 lb.	6,000 lb. to 9,999 lb.	2,000 lb. to 5,999 lb.	1,000 lb. to 1,999 lb.	Standard Container to 99 lb.				
One-Step General Purpose										
BMG-0425 Black-25	0.510	0.520	0.525	0.530	0.610	0.660		1.37		2.52
BMM-0425 Black-25 DC	0.510	0.520	0.525	0.530	0.610	0.660		1.37		2.52
BMG-2798 Black-25	0.510	0.520	0.525	0.530	0.610	0.660		1.37		2.52
BMM-2798 Black-25	0.510	0.520	0.525	0.530	0.610	0.660		1.37		2.52
BMRS-2798 Black-25	0.510	0.520	0.525	0.530	0.610	0.660		1.37		2.52
One-Step Heat Resistant										
BMMC-2035 Black-25 DC (2)	0.515	0.525	0.530	0.535	0.615	0.665		1.48		2.75
BMRS-2035 Black-25 DC (2)	0.515	0.525	0.530	0.535	0.615	0.665		1.47		2.73
One-Step Medium Impact										
BMG-2080 Black-25	0.580	0.590	0.595	0.600	0.680	0.730		1.35		2.83
BMRS-2085 Black-25 DC	0.580	0.590	0.595	0.600	0.680	0.730		1.37		2.87

PRICES SUBJECT TO CHANGE – TERMS: NET CASH DUE TENTH OF MONTH FOLLOWING DATE OF INVOICE

(1)UNLESS OTHERWISE SPECIFIED, STANDARD CONTAINER IS A 50-LB. BAG PACKED 2,000 LB. PER PALLET.

(2)STANDARD PALLET WEIGHT: 1,600 LB.

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A-4503

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UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
270 PARK AVENUE, NEW YORK, N.Y. 10017

GENERAL INFORMATION

Standard Phenolic Molding Materials can be combined for single-Truckload shipments when ordered for a single shipment in the same transportation vehicle. All quantities of a single product of 2,000 pounds or over will be priced at the minimum price for such compounds, but all quantities below 2,000 pounds will be charged at the price applicable to the materials and volumes concerned.

Except where noted, prices are based on shipments made in 50-pound bags, packed 2,000 pounds per pallet, which is the standard base unit. Any quantity of a single product which is a fraction of the base unit will carry the appropriate surcharge. On request, shipments will be made in drums (containing 200 to 325 pounds of material) at an additional charge of one and one-half a cent per pound and in bulk cartons (containing up to 1,000 pounds of material) at an additional charge of one cent per pound. Orders will be filled to the nearest drum or bulk carton weight or multiples thereof.

Minimum billing for a single shipment is $40.00

Minimum Truckload quantity is 24,000 pounds. Prices are for material delivered within the continental limits of the United States east of the Rocky Mountains and exclusive of Alaska. For Truckload shipments west of the Rocky Mountains, a two-cents-per-pound premium will be charged and four cents for Less-Than-Truckload shipments. Method of shipment at seller's option. If buyer requests method of transportation other than least expensive method, buyer shall reimburse seller for additional transportation expense involved. Prices for special or made-to-order compounds will be quoted on request.

PLEASE DIRECT ORDERS TO: UNION CARBIDE CORPORATION, Chemicals and Plastics, at the nearest Sales Office location given on back page.

Orders emanating from New Mexico, Montana, Wyoming, California, Oregon, Washington, Nevada, Utah, Arizona, and Idaho should be directed to: UNION CARBIDE CORPORATION, Chemicals and Plastics, Customer Order Center, 2770 Leonis Boulevard, Los Angeles, California 90058.

REQUESTS FOR TECHNICAL INFORMATION SHOULD BE ADDRESSED TO NEAREST SALES OFFICE.

February 1, 1974
F-43635C

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Union Carbide trial exhibit UC-5307: Union Carbide Chemicals and Plastics, Bakelite Phenolic Molding Materials G...
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DESIGNATION	PRICE PER POUND PER SHIPMENT IN STANDARD CONTAINER[1] AGAINST A SINGLE ORDER[S]										February 1, 1974 Page 1 of 1
	24,000 lb and over	10,000 lb. to 23,999 lb	6,000 lb to 9,999 lb.	2,000 lb to 5,999 lb.	1,000 lb to 1,999 lb	Standard Container to 99 lb.		Average Specific Gravity		Minimum Material Cost, ¢/Cu. in.
General Purpose										
BMG-5000 Black-25	0.315	0 325	0.330	0 335	0.415	0.465		1.34		1.52
BMM-5000 Black-25 DC	0.315	0 325	0.330	0.335	0.415	0.465		1.34		1.52
BMMB-5020 Black-25 DC	0 315	0.325	0.330	0.335	0.415	0.465		1.34		1.52
BMMA-5440 Black-25 DC	0 315	0.325	0 330	0 335	0.415	0.465		1.40		1.59
BMRS-5440 Black-25 DC	0.315	0.325	0 330	0.335	0.415	0.465		1.40		1.59
BMMA-5441 Black-25 DC	0.375	0.385	0 390	0.395	0.475	0.525		1.40		1.89
BMRS-5441 Black-25 DC	0.375	0.385	0.390	0.395	0.475	0 525		1.40		1.89
BMG-5498 Black-25	0 315	0.325	0.330	0 335	0.415	0.465		1.34		1.52
BMM-5498 Black-25 DC	0 315	0.325	0.330	0.335	0.415	0 465		1.34		1.52
BMM-7002 Black-25 DC	0.315	0.325	0.330	0 335	0.415	0.465		1.34		1.52
Heat Resistant										
BMM-5303 Black-25 DC	0.315	0 325	0.330	0 335	0.415	0.465		1.58		1.80
BMRS-5303 Black-25 DC	0.315	0.325	0 330	0 335	0.415	0.465		1.47		1.67
BMMC-5333 Black-25 DC	0 315	0.325	0 330	0.335	0.415	0.465		1.40		1.59
BMMS-5333 Black-25 DC	0 315	0 325	0.330	0.335	0.415	0.465		1.40		1.59
BMMA-5353 Black-25 DC	0 315	0 325	0.330	0.335	0.415	0.465		1.58		1.80
BMRS-5353 Black-25 DC	0.315	0.325	0.330	0 335	0.415	0 465		1.53		1.74
BMMA-5440 Black-25 DC	0 315	0 325	0 330	0.335	0 415	0 465		1.40		1.59
BMRS-5440 Black-25 DC	0.315	0 325	0 330	0 335	0.415	0.465		1.40		1.59
Medium Impact										
BMMB 7021 Black-25 DC	0 360	0.370	0 375	0.380	0 460	0 510		1 37		1.78
BMRS-7021 Black-25 DC	0 360	0.370	0 375	0.380	0.460	0 510		1.36		1.77

PRICES SUBJECT TO CHANGE – TERMS NET CASH DUE TENTH OF MONTH FOLLOWING DATE OF INVOICE

[1] UNLESS OTHERWISE SPECIFIED, STANDARD CONTAINER IS A 50 LB BAG PACKED 2,000 LB. PER PALLET.

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A-1023

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DESIGNATION	PRICE PER POUND PER SHIPMENT IN STANDARD CONTAINER[1] AGAINST A SINGLE ORDER[$]									
	24,000 lb. and over	10,000 lb. to 23,999 lb.	6,000 lb. to 9,999 lb.	2,000 lb. to 5,999 lb.	1,000 lb. to 1,999 lb.	Standard Container to 99 lb.		Average Specific Gravity		Minimum Material .Cost, ¢/Cu. In.
One-Step General Purpose										
BMG-0425 Black-25	0.415	0.425	0.430	0.435	0.515	0.565		1.37		2.05
BMM-0425 Black-25 DC	0.415	0.425	0.430	0.435	0.515	0.565		1.37		2.05
BMG-2798 Black-25	0.415	0.425	0.430	0.435	0.515	0.565		1.37		2.05
BMM-2798 Black-25	0.415	0.425	0.430	0.435	0.515	0.565		1.37		2.05
BMRS-2798 Black-25	0.415	0.425	0.430	0.435	0.515	0.565		1.37		2.05
One-Step Heat Resistant										
BMMC-2035 Black-25 DC[2]	0.420	0.430	0.435	0.440	0.520	0.570		1.48		2.24
BMRS-2035 Black-25 DC[2]	0.420	0.430	0.435	0.440	0.520	0.570		1.47		2.23
One-Step Medium Impact										
BMG-2080 Black-25	0.485	0.495	0.500	0.505	0.585	0.635		1.35		2.36
BMRS-2085 Black-25 DC	0.485	0.495	0.500	0.505	0.585	0.635		1.37		2.40

February 1, 1974
Page 1 of 1

PRICES SUBJECT TO CHANGE – TERMS: NET CASH DUE TENTH OF MONTH FOLLOWING DATE OF INVOICE

(1)UNLESS OTHERWISE SPECIFIED, STANDARD CONTAINER IS A 50-LB. BAG PACKED 2,000 LB. PER PALLET.

(2)STANDARD PALLET WEIGHT: 1,600 LB.

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SPECIFIC GRAVITY AND COST RELATIONSHIPS

c cubic inch = c./pound x specific gravity x 0.03611

SPECIFIC GRAVITY	OUNCES PER CU. IN.	GRAMS PER CU. IN.	SPECIFIC GRAVITY	OUNCES PER CU. IN.	GRAMS PER CU. IN.
1.25	0.723	20.488	1.61	0.931	26.388
1.26	0.728	20.651	1.62	0.937	26.552
1.27	0.734	20.815	1.63	0.942	26.716
1.28	0.740	20.979	1.64	0.948	26.880
1.29	0.746	21.143	1.65	0.954	27.044
1.30	0.752	21.307	1.66	0.960	27.207
1.31	0.757	21.471	1.67	0.965	27.371
1.32	0.763	21.635	1.68	0.971	27.535
1.33	0.769	21.799	1.69	0.977	27.699
1.34	0.775	21.963	1.70	0.983	27.863
1.35	0.780	22.127	1.71	0.989	28.027
1.36	0.786	22.290	1.72	0.994	28.191
1.37	0.792	22.454	1.73	1.000	28.355
1.38	0.798	22.618	1.74	1.006	28.519
1.39	0.804	22.782	1.75	1.012	28.683
1.40	0.809	22.946	1.76	1.017	28.844
1.41	0.815	23.110	1.77	1.022	29.009
1.42	0.821	23.274	1.78	1.028	29.172
1.43	0.827	23.438	1.79	1.033	29.336
1.44	0.832	23.602	1.80	1.039	29.500
1.45	0.838	23.766	1.81	1.046	29.664
1.46	0.844	23.929	1.82	1.051	29.828
1.47	0.850	24.093	1.83	1.058	29.992
1.48	0.856	24.257	1.84	1.062	30.156
1.49	0.861	24.421	1.85	1.070	30.320
1.50	0.867	24.585	1.86	1.074	30.483
1.51	0.873	24.749	1.87	1.080	30.647
1.52	0.879	24.913	1.88	1.087	30.811
1.53	0.884	25.077	1.89	1.092	30.975
1.54	0.890	25.241	1.90	1.099	31.139
1.55	0.896	25.405	1.91	1.104	31.303
1.56	0.902	25.568	1.92	1.110	31.466
1.57	0.908	25.732	1.93	1.116	31.631
1.58	0.913	25.896	1.94	1.121	31.794
1.59	0.919	26.060	1.95	1.128	31.958
1.60	0.925	26.244			

ounces/cubic inch = specific gravity x 0.5778
grams /cubic inch = specific gravity x 16.389

November, 1971
F-41912A

A14000

UNION CARBIDE®
SALES OFFICES

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2770 Leonis Boulevard
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(901) 396 5375

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Route 38 and Pleasant Valley Rd
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From Idaho, Nevada, Oregon, Utah
or Washington
(800) 227-0801

Southfield, Mich. 48076
26500 Northwestern Hway
(313) 354-0800

May 1, 1973
F-437678

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