MATERIAL CHARACTERISTICS - NON-METALLIC

Acetal

Transparent White, Black

·Good Electrical properties (400-465 v/mil)
·High mechanical properties & rigidity
·Fatigue, moisture, gasoline & solvent resistant
·Cannot resist: steam hot water, or strong bases
·Good cold flow resistance

Fibre

Black & Gray

·Extensively used for electrical insulation applications where little moisture is present (150-250v/mil)
·Fair mechanical properties
·Can be formed
·Good cold flow resistance
·Good thermal conductivity for a non-metallic (.25 btu/hr/sq ft/ºF/ft)

Fiberglass

Fiberglass

·Laminate of layers of fibreglass mesh with different impregnated resins for different based properties

G-7, Silicone resin

·Best heat resistance

G-9, Heat resistant melamine resin

·Best mechanical preoperties of non-metallics
·Good electrical insulator, particularly under wet conditions (350 v/mil)
·Good dimensional stability
·Good thermal cunducticity for a non-metallic (.29 btu/hr/sq ft/ºF/ft)

G-10, Epoxy resin

·Good demensional stability
·High mechanical strength at room temperature
·Good electrical insulator, even in humid conditions (400 v/mil)

G-11, Heat resistant epoxy resin

·Same properties as G-10 at room temperature
·Retains 50% of room temperature standard flexural strength when measured at 150°C. After 1 hour at 150°C.

Kapton®

Red brown to yellow orange

·DuPont® tradename for polyimide plastic film
·Excellent electrical properties (i.e. 7000 v/mil)
·Good tensile strength (25,000 psi)
·Ability to tolerate fairly high temperature (750ºF)
·Maximum thickness available - 0.005"
·Flexible, will not chip, flake or disintegrate under compression loads or in vibratory situations as does mica insulator applications

SEASTROM Manufacturing Co., Inc. 1-800-634-2356
456 Seastrom Street · Twin Falls, Idaho 83301 Fax (208)734-7222
www.Seastrom-Mfg.com Email: info@seastrom-mfg.com

PCTFE	**Natural** ·Electrical grade plastic ·Good insulator ·Expensive ·(Due to small sheet size, does not lend itself to automated production methods)
Mica	**Clear to light brown** ·Excellent electrical properties (3,000-6,000 v/mil) ·High heat resistance (1050ºF) ·Insulating material ·It can chip, flake & disintegrate under compression loads & vobratory situations ·(Does not lend itself to automated production methods)
Mylar®	**Translucent** ·Extremely good electrical properties (4,000 v/mil) ·Insulating material ·Maximum thickness - 0.014" ·Less expensive alternate to Kapton® for lower temerature applications (300ºF)
Neoprene	**Black synthetic rubber, 60 shore hardness** ·Resilient - tear resistant ·Cushioning properties - gaskets ·Aircraft application grade ·Good oil resistance ·Excellent abrasion & flame resistance ·Excellent sealing capabilities
Nylatron®	**Charcoal gray** ·Polymer Corp. trade name for molybdenum disulfide filled nylon ·Electrical properties lessend slightly by the molybdenum disulfide (356 v/mil) ·Increased resistance to cold flow and greater bearing qualities as compared to nylon
Nylon	**Opaque white** ·Good electrical grade material (358 v/mil) ·Good bearing properties ·Good anti-frictional properties ·High strength for a non-metallic ·Self-extinguishing - flammability reading of 94V2 ·Fair cold flow properties ·Flammability Classification - UL94, V-2

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Phenolics

XXXP

·Paper based with phenolformaldehyde resin impregnated

·Best moisture resistance for phenolics (0.8%)

·Low dielectric losses under severe humidity conditions

·Good electrical properties (325 v/mil)

·Less expensive than LE & CE, although more dificult to fabricate

LE

·Fine weave cotton cloth impregnated with phenolformaldehyde resin

·Good electrical properties (225 v/mil)

·Good moisture resistance (1.3%)

·Better machining properties & appearance than CE

·Easiest phenolic to fabricate

·Not good for primary insulation

·Good mechanical properties

CE

·Coarser weave cotton cloth impregnated with phenolformaldehyde resin

·Best mechanical properties of phenolics

·Good moisture resistance (1.6%)

·Good electrical properties (225 v/mil)

·Not good for primary insulation

Nylon, brown

·Nylon fabric impregnated with phenolformaldehyde resin

·All purpose electrical grade

·Good for operating temperature below 160ºF

Polyethelene

Translucent white

·Common plastic - quite inexpensive

·Good electrical insulator (460 v/mil)

·Good sealing capabilities

·Low water absorption rate (0.015%)

PTFE

Translucent white

·Excellent anti-frictional properties

·Good electrical properties (480 v/mil)

·Excellent chemical & corrosion resistance

·High heat resistance (500ºF)

·Fair cold flow properties

·Very low water absorption rate (0.005%)

·Excellent for low temperature applications

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