POLYMARK RESIN SYSTEMS

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P122

Ignition Coil Impregnating and Encapsulating Epoxy

Description:

Polymark P122 is a long working life, heat curing, two-component epoxy formulation. It was designed especially for potting high voltage ignition coils. The combination of low viscosity, good high temperature electrical properties and excellent thermal shock resistance makes P122 ideal for this application.

Use:

The P122 system is best handled with automatic mix/meter-dispensing equipment. The mixed material is introduced into preheated coils under vacuum. Depending on coil depth, pressure may be applied to insure complete penetration of the system into the coil windings. The potted coils are then cured at elevated temperatures.

Process Description:

The procedure for use of Polymark P122 in potting ignition coils may be summarized as follows:

1. Preheat coils to 105-110°C for 2 hours
2. Preheat the P122 resin to 95-105°C
3. Preheat the P122 hardener to 60-70°C
4. Vacuum strip both resin and hardener to .5 torr
5. Introduce the P122 system into coils under a vacuum of 1 torr.
6. Subject the filled coils to a vacuum of 1 torr or less for 10 to 20 seconds.
7. Cure on one of the following schedules:
   a. 12 to 16 hours at 80- 90°C
   b. 2 hours at 90-95°C - plus 2 hours @ 115-125°C
   c. 4 hours at 80-85°C - plus 2 hours @ 115-125°C

Typical Properties:

The values listed below are averages and are not intended for specification purposes. Contact Polymark when establishing specifications. In the interest of achieving a optimum properties in a minimal amount of time, the cured physical and electrical properties were developed by using a schedule of two hours at 90°C plus two hours at 120°C. The choice of cure schedule will vary with the application and users must establish their own optimum cure schedules.

Handling Properties:

Mix Ratio (resin to hardener)	
By weight	100:37
By volume	100:63
Viscosity @ 25°C	
Resin	55,000 cps
Hardener	325 cps
Weight/Gallon @ 25°C	
Resin	13.9 lbs
Hardener	8.3 lbs
Working Life @ 25°C	1-2 days
Typical Cure Schedules	
12-16 hours	@ 80-90°C
OR 2 hours	@ 90-95°C
PLUS 2 hours	@115-125°C

Physical Properties:

Hardness (Shore D)	90
Specific Gravity @ 25°C	1.42
Color	Black

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Temperature Rating Guide*	155°C
Flexural Strength	13,000 psi
Tensile Elongation	8.0%
Glass Transition Temperature (Tg)	65°C
Water Absorption (24 hours)	<0.5%
Weight Loss (168 hours @ 150°C)	<0.5%
Coefficient of Linear Thermal Expansion	35 x 10^{-6} in/in/°C

Electrical Properties:

Dielectric Strength	500 volts/mil
Dielectric Constant (1 MHz @ 25°C)	3.3
Dissipation Factor (1 MHz @ 25°C)	0.017

***Temperature Rating Guide:** Is based on average design requirements and the guide is not intended as a guarantee of suitability for all applications operating at that temperature. The guide is based on the weight loss shown in the same table.

Proportioning and Mixing:
Polymark P122 can be proportioned by weight or volume. These ratios are stoichiometrically calculated and should be closely followed. Automated meter-mix, dispensing equipment may be used for high volume production.

Deairing and Evacuation:
Unless a closed-chamber, mechanical mixer is to be used, air will be introduced into the epoxy system either during premixing or when catalyzing the mixture. The electrical properties of an epoxy are best when air bubbles and voids are minimized. Therefore, in extremely high voltage or other critical applications, vacuuming may be helpful. See "Process Description".

Mold Release:
When encapsulating a unit in a nonporous mold, a mold release should be used. Most mold releases evaporate quickly and, when properly applied, leave a surface that will release easily from Polymark epoxies. As with other flammable solvents, appropriate precautions should be observed.

Clean-Up:
It is recommended that customers use disposable containers and utensils when working with epoxies. However, when disposable materials are impractical, uncured epoxy can be removed by cleaning equipment with solvent. Observe appropriate precautions when using flammable solvents. Solvent-cleaned utensils should be thoroughly dried before reuse. Any remaining solvent can contaminate the next mixture.

Shelf Life and Storage:
Polymark P122 resin has a shelf life of six months at room temperature (25°C). Polymark P122 hardener has a shelf life of twelve months at room temperature. The fillers used in P122 resin may softly settle with extended time. Contact Polymark for options to reduce or eliminate resin settling. Lower temperatures also help to reduce settling.

Handling Precautions:
The labels on containers of Polymark materials contain current information on the hazards associated with each particular product. Most epoxy resins and hardeners are skin and eye irritants and some may actually be corrosive to the skin and eyes. Other problems, such as skin sensitization or serious health hazards, may exist. Further information on each product is contained in the Material Safety Data Sheet which will be sent upon request.