

**Technical Information  
Secondary Insulation**

**TI- 4002 – Epoxy Resin Vacuum  
Pressure Impregnating (VPI)  
Maintenance**

## TI-4002 Epoxy Resin Vacuum Pressure Impregnating (VPI) Maintenance

One of the major investments any motor manufacturer, motor rewind facility or transformer manufacturer can make is a tank of epoxy resin. While the amount of resin consumed in a part is a small percentage of the total bill of materials cost, a tank of resin can represent a significant capital expenditure. As with any large investment, proper care and maintenance is a prudent step to protect that investment.

The retention of the liquid properties of VPI epoxy resins during storage and use is dependent on a variety of factors including:

- 1) Part Temperature
- 2) Replenishment rate
- 3) Maintenance
- 4) Storage Conditions
- 5) Hibernation of a Tank of Resin

### **Part Temperature:**

As a general rule, the temperature of a part should be less than 50-55°C (120-130°F) before it comes into contact with epoxy impregnating resin. Preheating assists with penetration and may be required in some cases. The epoxy resin is damaged by exposure to temperatures that are too high.

### **Replenishment Rate:**

Typically, 100% reactive epoxy resins can only be adjusted with the addition of fresh resin. The rate of replenishment is a key factor in the long term properties of the liquid resin in a tank. Slow rates of replenishment or no replenishment will likely result in a shift in the properties of the liquid resin. Rates above 10% per month are considered to be ideal. Rates between 5% and 10% are considered good but unless other measures are taken may not be sustainable indefinitely. Rates less than 5% are considered slow and the liquid properties of the resin will probably not be sustainable for an indefinite period time.

### **Maintenance:**

In order to insure the maximum useable life of an epoxy resin it is important to monitor its properties. This can be done by testing on site or by sending regular samples to a qualified laboratory or the resin manufacturer. The resin manufacturer will often make suggestions for additions to the epoxy resin in response to the results of this testing. It is the responsibility of the customer to make the recommended adjustments to maintain the integrity of the product.

### **Storage Conditions:**

The storage temperature of epoxy resin has a dramatic influence on its liquid properties over time. The liquid properties of VPI epoxy resins will change with time. The rate of change is accelerated by storage at temperatures above room temperature, 25°C (77°F). The rate is slowed by storage below room temperature. Experience has shown that storage between 17-20°C (63-68°F) is suitable for tanks that are used on a nearly daily basis. See HIBERNATION below for tanks with less usage. Storage of epoxy resin under a vacuum provides two benefits. First, it reduces the moisture content. Second, it eliminates or reduces the need for wet vacuum, saving time. Vacuum levels of 5 - 10 mm Hg are recommended. Finally, agitation of resin under storage is required to ensure a consistent temperature throughout the resin and assist with releasing any air that may be trapped. The agitator in a storage tank of resin should be run 15 minutes every 3 to 4 hours. The agitator should be run for 1 to 2 hours when the resin is returned to the storage tank after processing a unit.

### **Hibernation of a Tank of Resin:**

If a tank of resin will be idle for more than two weeks, it is recommended that the storage temperature be reduced to the range of 7-13°C (45-55°F). As mentioned above reduction of the storage temperature will slow the rate of change of the liquid properties that an epoxy resin normally undergoes. Agitation and vacuum should be maintained to ensure uniform temperature throughout the resin. Before resuming use, the temperature should be increased to the normal level of 17-20°C (63-68°F) approximately two days before use.

Please contact ELANTAS PDG, Inc. Technical Service if you have any questions.

Phone number 1.314.621.5700 Extension 717 or 1.800.325.7492 Extension 717

The above properties are typical values and are not intended for specification use.

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