



Shop Tech Talk December 2008

Q. How the VPI (Vacuum Pressure Impregnation) Insulation System Benefits the Life of Drive Motors

In a conventional motor rewind repair the rewind stator is preheated and then immersed in varnish (in our case Von Roll Polyester 709, a solventless polyester resin) and left submerged until maximum penetration of the varnish has been accomplished. The motor is then raised out of the varnish, allowed to drain off excess and then it is placed in an oven for baking. This can be repeated several times to allow more build up of varnish.

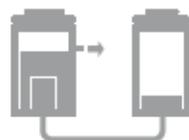
In a VPI treatment of the winding the preheated stator is placed in a pressure vessel and a vacuum is created in the vessel which pulls out any contaminants and moisture. Varnish is then let into the vessel via a connecting valve, from an adjoining refrigerated varnish tank, containing in our case Ranbar Epoxy 7-619, a high build epoxy varnish. After sufficient varnish is let in the vessel to cover the stator, the valve is closed, the vacuum is released and positive pressure is applied to the stator and varnish and held to achieve maximum impregnation, for positive penetration of the epoxy resin into the winding voids. After a suitable time the connecting valve is opened and the epoxy resin is transferred back to its storage tank and the motor is put back into the oven for cure.

The VPI process is considered the most effective way known to eliminate the dead air spaces that cause hot spots within the motor coils. During the VPI process, the resin seals the stator against environmental conditions and bonds all components of the insulation system together for good mechanical strength. This is very effective in reducing mechanical vibrations. The VPI process and resin also enhance the dielectric capability between windings and ground. This allows the final motor to survive higher voltage stress levels without failure. How long an insulation system will be serviceable depends on the materials chosen and the service environment. Thermal, mechanical, voltage and environmental stresses all combine to reduce the service life of the motor .

We consider our VPI treatment to be the best possible way to treat your drive motors, considering all the possible stresses that can be applied by the electronic drive controlling it.



1.
Transfer preheated motor to vacuum vessel. Pull vacuum.



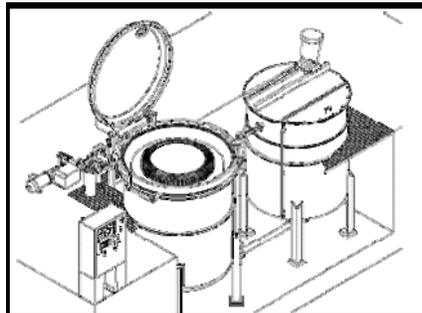
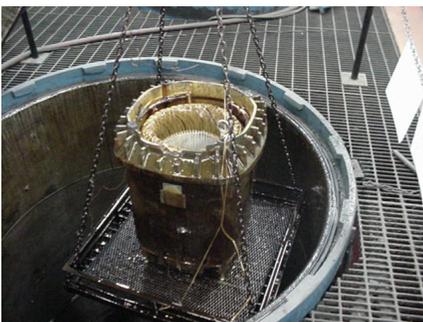
2.
Transfer resin under vacuum (the vacuum pump must be closed). Allow time to soak.



3.
Release vacuum. Apply positive pressure.



4.
Transfer resin back to storage tank. Put motor back in oven and cure.



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