

## *cenvar* Insulating Varnishes

### Impregnation Process Guide: VPI (Vacuum Pressure) & DIP-BAKE

Follow the recommended procedure for impregnation using *cenvar* Insulating Varnishes, to achieve optimal results.

#### PROCESS STEPS

##### 1. Pre-Heating

- Heat windings in a well-ventilated oven at 100–120°C for 2–3 hours to remove moisture and stress. Allow the windings to cool to around 60°C before impregnation.

##### 2. Vacuum Pressure Impregnation (VPI)

- **Vacuum Drying:** Place the coils in a vacuum chamber, switch on the pump, and apply a vacuum of less than 1 mbar for approximately 15 minutes.
- **Varnish Application:** Slowly open the varnish inlet valve, fully immersing the coils in varnish. Ensure bubbles are fully released, indicating complete varnish penetration.
- **Pressurization:** Introduce dry, moisture-free air at 2–3 kg/cm<sup>2</sup> for 15 minutes, then slowly release the pressure.
- **Drain & Transfer:** Let excess varnish drip for 10 minutes before transferring to the oven, keeping the coils free of dust and contaminants.

##### 3. Curing

- Start at a low temperature (80–90°C) for about 2 hours to allow solvent evaporation without trapping. Gradually increase to the recommended curing temperature as specified in the product data sheet. Curing times may vary based on the size and type of winding.

##### 4. Dipping Method (Alternate Option)

- Pre-heat coils as above, then dip them gradually in varnish to release air bubbles.
- **Transfer to Oven:** Avoid long exposure to air at this stage. Allow excess varnish to drip briefly, then move to a clean tray in the heating oven. Follow the same curing procedure as for VPI.

## CHECKS

- **Viscosity Monitoring:** Regularly check varnish viscosity using FORD CUP NO.4. Add the recommended thinner as needed to maintain optimal viscosity, adjusting under constant stirring.
- Periodically add fresh varnish.
- Periodically clean the varnish tanks, pipelines, ovens. Scrap off the dried varnish and any settlements in tanks and ovens.

## PRECAUTIONS

- **Storage & Handling:**
  - Store varnishes and thinners below 30°C, away from flammable materials. Use CO<sub>2</sub> or Dry Chemical Powder extinguishers if necessary.
- **Work Area Safety:**
  - Ensure the oven has exhaust fans to prevent pressure buildup and never block exhaust ducts.
  - Avoid direct vapor exposure; stand to the side when opening oven doors.
- **Personal Protection:**
  - Avoid skin and eye contact; wash with soap and water if contact occurs and seek medical attention if irritation persists.
  - Avoid inhaling vapours. Use proper ventilation and exhaust systems, and in cases of inhalation, move to fresh air and seek medical aid.
  - For ingestion, do not induce vomiting; drink water and get medical assistance immediately.
- **Housekeeping:**
  - Keep the work area clean and dry. Clean spills immediately, and maintain varnish tanks to prevent scale buildup.
  - Use gloves and breathing protection when handling varnishes.

**Additional Information:** For detailed safety information, request the Material Safety Data Sheet (MSDS).

*This guide provides general recommendations based on our knowledge and experience. Suitability for specific applications should be determined by the user. We accept no liability for technical outcomes or damages arising from use.*