

**Standard Operating Procedure and Checklist of Minimal Requisite Facilities for utilization of hazardous waste under Rule 9 of the Hazardous and Other Wastes (Management and Transboundary movement) Rules, 2016**

**Utilization of Resin Waste generated during Resin Impregnation of Electrical Coils**



**cpcb**

February, 2017

**Central Pollution Control Board**  
(Ministry of Environment, Forest & Climate Change, Government of India)  
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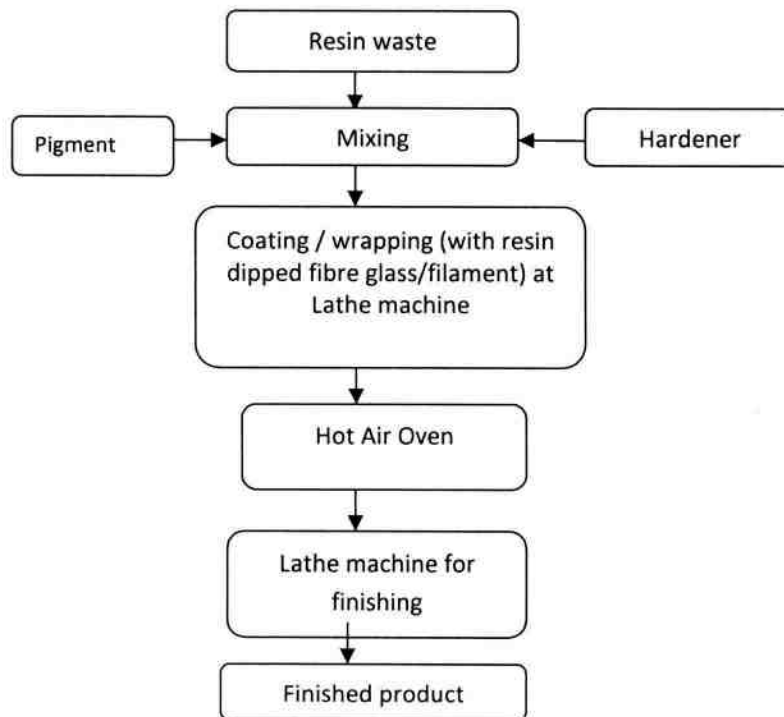
### 26.1 Source of Waste

Resin waste (mixture of Bisphenol A and Epichlorohydrin) is generated during impregnation of electrical coils by vacuum pressure impregnation process. When the viscosity of resin increases (around 50-60 centipoise) it is not suitable for impregnation, hence discarded as hazardous waste (Categorised under S.No. 23.1 of schedule-I of HOWM Rules, 2016).

### 26.2 Utilization Process

The utilization process involves mixing of resin waste with amine based hardener (1%) and colour pigment (2%) followed by coating the ferrous or non-ferrous rods/bars with resin mix to get the insulation coating/cover. After coating or wrapping the resin-mix dipped fibre-glass filament over the surface of the material to desired thickness on a lathe machine, a shrink tape (made of polyester) is wrapped and kept in the oven at 120 - 140°C for 2-3 hours for curing. The oven dried material is further subjected to lathe machine for surface finishing so as to obtain desired insulation over the HT/LT electrical components.

**Process Flow Diagram**



120 – 1400 °C for 2-3 hours for curing. The oven dried material is further subjected to lathe machine for finishing so as obtaining desired insulation over the HT/LT insulator.

- (9) The unit shall maintain proper ventilation in the work zone and process areas (preferably with ventilation ducts above the process units connected to ID fan with exhaust above roof level). All personnel involved in the plant operation shall wear proper personal protective equipment such as Safety glasses with side shields or chemical splash goggles; wear liquid-proof, chemical resistant gloves (such as nitrile-butyl rubber, neoprene, butyl rubber or natural rubber) and full body covered clothing.
- (10) The unit shall provide suitable fire safety arrangements and flame proof electrical fittings.
- (11) It shall be ensured that resin waste is procured from the industries who have valid authorization for generation/storage of the same from the concerned SPCB/PCC as required under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- (12) The unit shall submit quarterly and annual information on hazardous wastes consumed, its source, products generated or resources conserved (specifying the details like type and quantity of resources conserved) to the concerned SPCB.
- (13) The waste generated (such as waste resin mix, waste generated during cutting/finishing cuttings and used chemical drums) shall be collected and temporarily stored in non-reactive drums/container in a dedicated hazardous waste storage area and sent to TSDF within 90 days from generation of the waste. Such storage area shall be covered with proper ventilation.
- (14) The unit shall maintain a passbook issued by concerned SPCB wherein the following details of each procurement of resin waste shall be entered:
  - Address of the sender
  - Date of dispatch
  - Quantity procured
  - Seal and signature of the sender
  - Date of receipt in the premises
- (15) A log book shall be maintained with information on source and date of procurement of resin waste, quantity, date wise utilization of the same, hazardous waste generation and its disposal, etc.
- (16) The unit shall maintain record of hazardous waste utilised, hazardous waste generated and disposed as per Form 3 & shall file annual returns in Form 4 as per Rule 20 (1) and (2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, to concerned SPCB.

**Standard Operating Procedure and Checklist of Minimal Requisite Facilities - Utilization of Resin Waste generated during Resin Impregnation of Electrical Coils**

<b>S. No.</b>	<b>Requisite Facilities</b>
1.	Storage shed(s) for storage of resin waste in steel container only under cool, dry, well-ventilated covered storage shed(s) within premises.
2.	Mechanized system for - transfer of resin waste from drums (such as drum tilters) - mixing of resin waste with hardener (closed vessel with stirrer)
3.	Lathe machine (s)
4.	The process units shall have proper ventilation (preferably with ventilation ducts above the process units connected to ID fan with exhaust above roof level).
5.	Closed Hot Air Oven with provision of vent over roof top
6.	Covered hazardous waste storage space to store hazardous generated during utilization process
7.	Smoke detector and fire alarm system at resin waste storage and handling area.

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