

HYDROPHOBIC POTTING MATERIAL

It is frequently observed that ICCP electrodes of Indian Naval ships get polarized by shorting due to the flooding of cofferdam with bilge water or ingress of water from cofferdam itself leading to frequent repairing of electrode connections. The electrode connectors of ICCP system cannot be encapsulated in the cofferdam with thermosetting resin as water proofing material such as epoxy, polyurethane etc. because repairing work of electrode needs the entire potting material to be removed from the cofferdam. It is very difficult to remove existing potting material from the system. NMRL developed a potting compound based on silicone resin having unique characteristics such as hydrophobicity as well as softness after curing. After complete curing of this potting material, whenever there is a requirement of repairing work of electrode, it can be easily removed from the cofferdam. It cures at ambient condition within 24 hrs. However complete hard drying takes 7 days time.

Above potting compound is prepared by mixing the base component with catalyst in their requisite ratio. After proper mixing, it can be poured in the cofferdam to encapsulate the electrode connectors.

This potting material can be poured in the manually cleaned cofferdam coated with two coats of epoxy primer. In field trial, after a period of 2 years, the developed potting material was found free from cracks and delamination and showed stable hull potential. The expected service life of this material will be more than 10 years.



Surface preparation of cofferdam



Cofferdam coated with primer



Cofferdam filled with potting material

Photographs of cofferdams at various stages

The salient features of the potting material are as given below,

- Two component system
- 100 % solid, No VOC
- Quick setting at ambient temperature, hydrophobic and chemical resistant material
- User friendly application of potting material
- Avoid short circuiting of ICCP components with ship's hull
- Hardness : 55 ± 3 Shore A
- Dielectric constant ($0.1 - 10^5$ Hz) : 0.6
- Electrical resistivity (Ω cm) : 1.3×10^{12}
- Cured material can be easily removed for maintenance of electrodes