

Corrosion Under Insulation Behavior of Phenolic Epoxy Coatings under Contacting and Contact-free Insulations

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ABSTRACT

CUI (corrosion under insulation) is reportedly a contributor to the failure of insulated piping and process equipment. Protective coatings are among various effective measures to manage the CUI of industrial assets. Phenolic epoxy is among the widely used coatings under thermal insulations. This research work involves CUI testing of phenolic epoxy coating for 192 hours as per applicable ASTM standard G189-07 using cyclic wet operating conditions. The resulting weight loss from the test was converted to corrosion rate followed by microscopic checks. The as-coated (i.e., new) surface and post-test coatings were characterized using microscope and surface topography to account for damage modes and surface roughness. Phenolic epoxy coating under contacting insulation suffered a higher material loss rate, dis-bonding, and holiday defects tendency in comparison to contact-free insulation with low-point drainage.

Key words: Insulation, Corrosion under insulation, Coatings, Phenolic epoxy coating, Degradation, Optical microscopy, Contact-free insulation, low-point drainage