Epoxy Condenser Tube Sheet Protection

Typical heat exchangers & condensers with copper tubes inserted into carbon steel tube sheets experience galvanic corrosion due to the dissimilar metals. In the presence of water, a corrosion cell is established causing rapid loss of carbon steel. This loss of steel will leave the copper tube ends protruding from the sheet. The result is turbulent flow patterns,

sediment buildup, and eventual tube sheet perforation and refrigerant loss.

The process of installing epoxy coatings has the following benefits:
- ✓ Restore smooth surface for less turbulence and higher efficiencies.
- ✓ Restore corroded water flow division plates to eliminate condenser water bypass in dual pass condensers.
- ✓ Eliminate galvanic corrosion by coating steel to copper interfaces.
- ✓ Extend equipment life expectancy and minimize potential for refrigerant loss.

A successful application will have the following characteristics:
- ✓ Tight & secure temporary containment to protect surrounding equipment.
- ✓ Plug tubes with rubber stoppers.
- ✓ Media blast entire tube sheet face and water box or end bell.
- ✓ Remove rubber stoppers and insert corks flush with tube sheet face.
- ✓ Apply base coat of ceramic metal to fill voids and restore flush and smooth surfaces.
- ✓ Apply multiple coats of wear resistant ceramic epoxy for topcoat protection.
- ✓ Punch, then pull corks leaving a smooth transition and sound adhesion of epoxy to copper face of tube.

For the best performance and long life, installation of a sacrificial anode after epoxy coatings is ideal. When coatings are applied any slight penetration or pinhole will result in concentration of corrosive force in that very small area. A zinc, or magnesium anode, will serve as double protection and is well worth the investment.

TRS has served the Colorado Front Range since 1993. We offer turnkey installation of protective epoxy coatings and sacrificial anodes. Please contact our office for more information, installation references, or a quote for your specific equipment.