
E-Coating

White paper

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Questions on Data Center Cooling Efficiency?

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How E-Coating pumps can reduce maintenance and repair costs and improve HVAC system efficiency

Without a protective coating, iron components exposed to water will naturally oxidize and introduce rust to a system. Cathodic Electrodeposition (CED) coating, commonly known as E-coating, can be applied to pumps as an effective method of preventing oxidization and erosion.

In HVAC applications, during periods of inactivity, the formation of rust between the impeller and the casing can cause the impeller to stick or seize. Prevention of seizing requires regular maintenance. When maintenance practices are neglected and a pump seizes, the issue may require repair or even a complete replacement of the pump. If a pump is seized after long periods of inactivity, maintenance personnel may have to jog the pump or externally torque the pump with a wrench to break the seizure.

In some fluid-flow applications, the system fluid can cause wear or erosion in a pump casing over years of operation. Eventually this results in enlarged clearances between the impeller and casing, increased internal leakage, and reduced efficiency. Erosion and oxidation on internal surfaces of pump volutes and piping can also reduce system efficiency. Surfaces that are rough or pock-marked increase hydrodynamic drag, which increases energy costs.

In addition to seizing and reduced pumping efficiency, oxidation of surfaces within the pump can have serious consequences for components of the broader mechanical system. Particles of rust entrained in the system fluid can clog filters or cause degradation in boilers, chillers and valves.

The E-coating process involves submerging a metal part in a bath of paint emulsion and then applying an electrical current that binds the paint to all surfaces of the part. The result is a thin, uniform coating on all surfaces that provides corrosion resistance and abrasion resistance.

The application of E-coating prevents oxidation, which in turn avoids the issue of seizing and prevents damage to the pump during start-up. E-coating a pump also protects internal surfaces from erosion, averting the declines in hydraulic performance and efficiency that would otherwise occur.

FIGURE 1: RUSTING ON THE CASING WITHOUT E-COATING

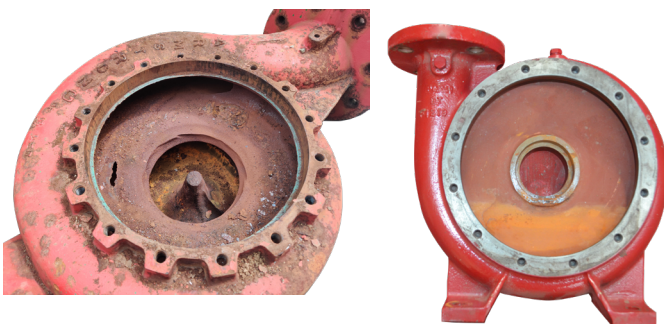


FIGURE 2: WATER LEAKAGE FROM RUSTED CASING, WITHOUT E-COATING



KEY VALUES OF E-COATING

- **Reduced energy costs** - By eliminating or delaying the decline of pump performance and efficiency caused by internal corrosion and surface roughness, e-coatings can provide important energy savings.
- **Reduced lifecycle costs** - E-coating yields savings on pump maintenance, repair, and related downtime.
- **Reduced component costs** - E-coating can be used in a variety of fluid applications for which uncoated cast iron may not be chemically compatible. Without E-coating application specifications may require that component manufacturers use more expensive metals.
- Preserves the performance and efficiency of other components by eliminating the movement of rust into the larger HVAC system.

FIGURE 3: CASING WITH E-COATING



For best efficiency, reduced maintenance and repair costs, and improved uptime, E-coating is always recommended for pumps.

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