

Why do Mechanical Seals Fail?

Mechanical shaft seals have two polished faces which run against one another, forming a barrier preventing solution from leaking. A small quantity of liquid crosses the faces and is necessary to lubricate and remove heat from the seal faces. The two most common causes of seal failure are:

1. Abrasive Wear – The carbon seal face is scratched by harder material crossing the face. Damage to the seal by harder materials can be caused by abrasive solution materials, rust or corrosion near the seal, precipitates which come out of solution when heating, and residue between the seal faces when a pump is shut off and not flushed out. This type of seal failure can be minimized by flushing the pump with water after use and storing the pump filled with antifreeze to prevent corrosion and freezing.

2. Thermal Shock – The seal face is cracked by cool liquid contacting a hot seal. There is no liquid to lubricate or remove heat from the seal faces when a pump runs dry. The seal heats up rapidly to a temperature that causes damage to the seal components. The resulting thermal shock creates radial cracks in the white ceramic face and the heat may melt rubber components.