

## Lubricating Oil Effectiveness

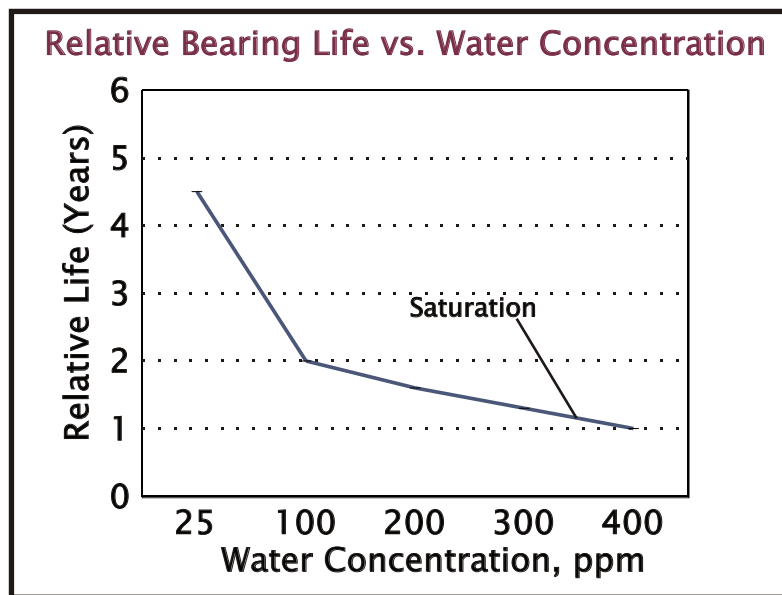
The primary function of liquid lubricants is to minimize or eliminate friction, wear, and surface damage to machine elements such as bearings and gears. Secondary functions include corrosion resistance, heat reduction, and prevention of dirt and wear debris damage. **The effectiveness of these functions are significantly reduced when the oil becomes contaminated or oxidizes.** It is estimated that water contaminated oil can shorten bearing life by as much as 85 percent!

### Oil Contamination

The two major types of oil contamination are **water and particulate (solids)**.

#### **Causes:**

1. Water contamination is common in equipment where high humidity levels exist. Rain, steam quenching, and equipment cleaning are also sources of water leading to equipment lubrication contamination. Water content in oil is visible to the naked eye above 400 ppm concentration. **Water contamination of oil in concentration levels as low as 200 ppm can be damaging.** Poor bulk lubricant storage and transfer methods often lead to high levels of both water and particulate contamination.



2. Particulate contamination is common where high levels of airborne particles of solids such as paper pulp, dust, metals, and chemical residue exist. The naked eye can see only particles 80 microns in size or greater. **Major bearing manufacturers recommend micron size of no greater than 13 microns be allowed in equipment lubrication.** Poor storage and transfer methods are major contributors to oil contamination. Use of Trico oil dryers can reduce relative humidity levels in equipment to reduce and often eliminate water contamination of oil.

**Prevention:** Oil lubricated equipment will draw in surrounding air during temperature changes, resulting in pressure increase and decrease cycles, allowing humidity and airborne particulate to enter the equipment lubrication. Sealing the equipment with Trico closed system lubricators, pressure-maintaining expansion chambers, and proper seals significantly reduce, and often eliminate lubricant contamination.



## Oxidation

The rate of chemical oxidation of oil doubles with each 18 degree F rise in temperature. This significantly shortens the effective life of the equipment lubrication.

**Causes:** Oxidation can be caused by both excessive lubrication (high levels in wet sump applications) and lubricant starvation (low levels). Improper oil viscosity and selection also often lead to higher operating temperatures and increased oxidation rates.

**Prevention:** Proper setting of Trico's Opto-Matic® constant level oilers ensure optimum oil levels, that prevent oxidation caused by excessive or inadequate lubrication. Use only equipment manufacturer recommended oil type and viscosity.

