

Fluid Properties Explained 5 – The Differences Between Lube Oils and Heat Transfer Fluids

There is sometimes a fine line between the Heat transfer fluid and Lubricating Oil product lines marketed by some oil companies. Granted both are slippery and transfer heat but beyond that, they are formulated for very different functions. There are certain terms and test results provided in product data sheets that are more common to lube oils than heat transfer fluids.

1. **Viscosity Index** – Most lube oils are formulated for as little change in the viscosity as possible whereas for heat transfer you want as much change as you can get. But is a high number better than a low number? And what is the viscosity at a given temperature?
2. **SAE Grade / ISO Grade** – General lubricating terms where the lower the number, the lower the viscosity. Typically used by a manufacturer for distinguishing between 2 product grades. Works for car oil but again provides no data useable for either selecting oil or designing systems.
3. **SUS (Saybolt Universal Seconds)** – This is a viscosity unit that makes sense only to lubrication types. Heat transfer fluids use centistokes, centipoise or lbs/ft-hr for selecting pumps and sizing heat exchangers.
4. **Copper Corrosion** – Copper is seldom used in heat transfer systems so why worry about corrosion?
5. **Resistance to Water/Non-foaming/Demulsibility** – Only lube oils retain water long enough to cause system corrosion or foam. Anybody who has seen a geyser of thermal fluid coming out of an expansion tank vent knows that water doesn't typically hang around a thermal fluid system for very long. It converts to steam and forces an equivalent volume of liquid out of the system.
6. **Conradson Carbon Residue / Ramsbottom Carbon Residue / Carbon Residue (Micro Method)** – These tests determine how much solid material remains after a sample has been completely evaporated and then pyrolyzed at high temperatures while exposed to air. While theoretically an indication of the tendency of an oil to form deposits, it really is a measure of the amount of inorganic additives since the pyrolysis step destroys most of the carbon in the residue

So when you are reviewing product literature, keep a look out for some of these claims and properties that indicate that the product is not formulated exclusively for heat transfer.