

Fluid Properties Explained 6 – Thermal Oil Testing vs. Lube Oil Testing

Because lubricant tests are inexpensive to run, lube-oil testing labs are sometimes used for testing thermal oils. The problem with using these labs is that the tests – which include Wear-and-Contamination Metals and Particle Count – measure properties that are important for lubrication and not heat transfer

For example, heat-transfer fluid pumps do not operate at high pressure and so do not have the close mechanical tolerances that can be affected by the presence of particles (as in machine bearings or lubricating-oil pumps). Nor is there metal wear that requires a metals analysis to prevent equipment downtime. Particles in thermal oil are more a nuisance than a threat – at worst they settle out in the expansion tank.

Some lube-oil test results – Acid Number and Viscosity – can be useful for thermal oils. However, one problem with relying on only viscosity to determine fluid condition is that it measures only the average of all of the components – it does not detect the presence of contaminants. A Distillation Range should be included with the testing program to positively determine whether any contamination has occurred.

Where lube-oil tests become particularly deceiving is when the results are compared to lube-oil standards which are much different than thermal-oil standards. For example a low viscosity is desirable in a thermal oil because it increases the rate of heat transfer, while in lubricating oils it indicates that contamination has occurred, reducing its lubrication properties. So be cautious of accepting recommendations based on a lube-oil test report.