



## Hydraulics : Introduction

### Contaminants in hydraulics contribute to component wear.

Hydraulic systems are susceptible to three major problems: Firstly, they are affected by the smallest of particles (greater than 2 microns). High operating pressures combined with close tolerances between moving parts require the system to be ultra clean. A majority of hydraulic systems are “closed loop”, that is, no part of the system is open to the atmosphere. Contamination by foreign matter (in particular silica which is highly abrasive) typically occurs through faulty breathers or filler caps.

The next major problem for hydraulic systems is water. Water contamination may emulsify the oil leading to thickening and also lead to rusting of components. Water contamination may enter through faulty breathers or leaking heat exchangers. Ideal water contamination should be below 100 ppm (0.01%) for general hydraulic systems. For turbine bearing lubrication oil, ideal contamination should be below 25 PPM (0.002%).

The third major problem for hydraulic systems is excessive temperature. A ten degree rise above normal operating temperature will halve the life of the oil. Analysis results will show a rise in oxidation and a depletion of additives. Hydraulic systems which have tank heaters have been known to hasten oil degradation through faulty thermostats.

The ideal filter system is called a kidney system. It consists of one or more filters coupled to a small electric, air or hydraulically driven pump drawing oil from the tank and returning to the tank below the low oil level (to prevent aeration).



In addition to a substantial increase in both operating performance and equipment longevity, efficient filtration of hydraulic oils also delivers a comprehensive range of cost savings.

Filter Technology's ultra-fine filtration systems will dramatically reduce contamination in hydraulic oils.

Oil analysis is the best determination for the condition of any oil. One client initially recorded a hydraulic oil cleanliness level of 22/15. Because of the huge quantity of hydraulic oil required for this equipment and the failures the machinery was experiencing, a custom Filter Technology by-pass filtration system was designed, constructed and installed.

An oil analysis was taken at 100 hours to grade the performance of the filtration system. This oil analysis recorded a cleanliness level of 12/9 (11 code grades cleaner).