

# Contamination Control in Hydraulic and Lubrication Systems of Paper Industries: An Overview

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## ABSTRACT

The modern paper making process creates a very demanding environment for the hydraulic fluids and lubricants used on a typical paper machine, due to the inevitable presence of particulate contamination, water and steam throughout the mill, which can become ingressed in the hydraulic fluids and lubricants, through faulty seals, reservoir access ports, tank breathers, and other points of ingress. The presence of particulate contamination in hydraulic fluids and lubricants can cause wear of critical system components, such as bearings, valves, and pumps, and can lead to reduced product quality, reduced component life, reduced equipment uptime, and reduced productivity.

The presence of water in hydraulic fluids and lubricants can have wide-ranging effects on system components. Surface corrosion, probably the most obvious effect, is directly linked to the presence of free bulk water. Accelerated metal surface fatigue, such as in bearings, can be promoted even if all the water present in the fluid is dissolved. Furthermore, dissolved water can also adversely affect fluid properties, by accelerated oxidation of the fluid base stock and premature depletion of additives due to additive precipitation or chemical reactions involving additives. The detrimental effects of particulate and water contamination are compounded by the paper industry's development towards more power, more throughput, and longer service intervals.

In this paper, the author discusses the benefits of implementing a comprehensive approach to cleanliness control for hydraulic and lubrication systems typically used in the paper machine areas, coupling high efficiency filtration systems for the removal of particulate contamination with vacuum dehydration purifiers for the removal of free and dissolved water, and diagnostic instrumentation for measurement of levels of particulate and water contamination.

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