

**Meeting The Filtration Challenges Of Contemporary Hydraulic Systems**  
**by**  
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**ABSTRACT**

Particulate contamination in a hydraulic system fluid is generally considered the most important factor governing the reliability and life of the system components. Modern hydraulic systems demand cleaner fluid and better filtration performance, and this drives filter manufacturers to continuously make improvements to their products. It has long been recognized that cyclic, or unsteady flow has a significant deleterious impact on filter performance. Since hydraulic systems normally generate cyclic flow, filters are subject to these flow variations, and should be designed to maintain consistent particle capture and retention efficiency such that the effluent fluid cleanliness target is met.

The normal Multi-pass test procedure, ISO 16889, cannot measure the effects of flow variations; therefore, the Cyclic Stabilization Test was developed and adopted as SAE ARP4205. The SAE procedure also introduces a new method for rating filter performance that enables discrimination between filters under cycling conditions, thereby giving filter designers a tool for developing a stress-resistant filter. This paper details the need for improved filtration and documents investigations using the SAE procedure to study the performance of a number of hydraulic filter elements as a function of flow cycling, vibration, contaminant, and temperature.