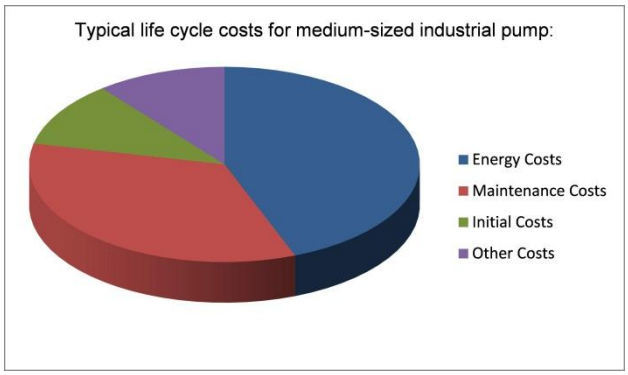
BLACOH™ FLUID CONTROL

Technical Bulletin

August 9, 2012

Peristaltic Hose Pump Energy Study:
Pulsation Dampeners Reduce Energy Consumption for Cost Savings



According to industry sources, pumping systems range from 25-50% of the energy usage in certain industrial plant operations, and over 80% of pump life cycle costs go towards energy and maintenance. Further, some studies have shown that 30-50% of the energy consumed by pump systems could be saved through equipment or system changes.[1] Volatile energy costs coupled with the global need to reduce energy consumption drives customers to seek out new ways to maximize pump system performance. To assist in that effort, we undertook a study of peristaltic hose pumps to determine the potential energy savings that could be obtained by using a BLACOH pulsation dampener.

Multiple tests measured the performance of hose pumps with both 1 phase and 3 phase motors. Test results showed that energy consumption was reduced anywhere from 5% up to 19% when a BLACOH pulsation dampener was added to the system. By increasing the efficiency of fluid flow within the system, the pulsation dampener was highly effective in reducing the amount of energy needed to operate the pump. Using a dampener on the pump's discharge minimizes the requirement to re-accelerate the fluid in the system downstream of the dampener. Because the fluid stays in motion, acceleration head is minimized. When fluid stays in motion, less energy is required to move it. For example, a car traveling down the highway will use less gasoline than a car driving through town in stop-and-go traffic.

Typical Energy Savings with BLACOH Pulsation Dampener

Phase	Pipe Diameter O.D.	Fluid	Watts	Energy Savings*
1	1 inch	Water	307	6.5%
1	1 inch	Glycerin	355	14.1%
3	2 inch	Water	1400	14.3%

** The percentage difference in peak average watts recorded with and without the pulsation dampener in the system.*

Our energy study test results varied depending on fluid viscosity, temperature and pump speed. Various fluids were pumped with the smaller 1 phase motor hose pump including water, water with thickening agent, glycerin and vegetable oil. As expected, the pump's energy consumption increased with more viscous fluids.

Energy consumption was measured as the average watts used to operate the pump over time. The energy savings percentage was calculated as the difference in peak average watts measured with and without the pulsation dampener in the system. The chart below shows actual test results measuring the pump's energy consumption (watts) processing the higher viscosity glycerin with and without the BLACOH pulsation dampener in real time; i.e., the pump was started and then the pulsation dampener was turned off, on, off, on, etc. as the pump was running. As you can see, energy consumption decreased significantly when the dampener was turned on and increased when the dampener was turned off. Again, changes in the pump's energy consumption varied based on fluid viscosity, temperature and pump speed. However, in all tests conducted, energy consumption decreased with the pulsation dampener.

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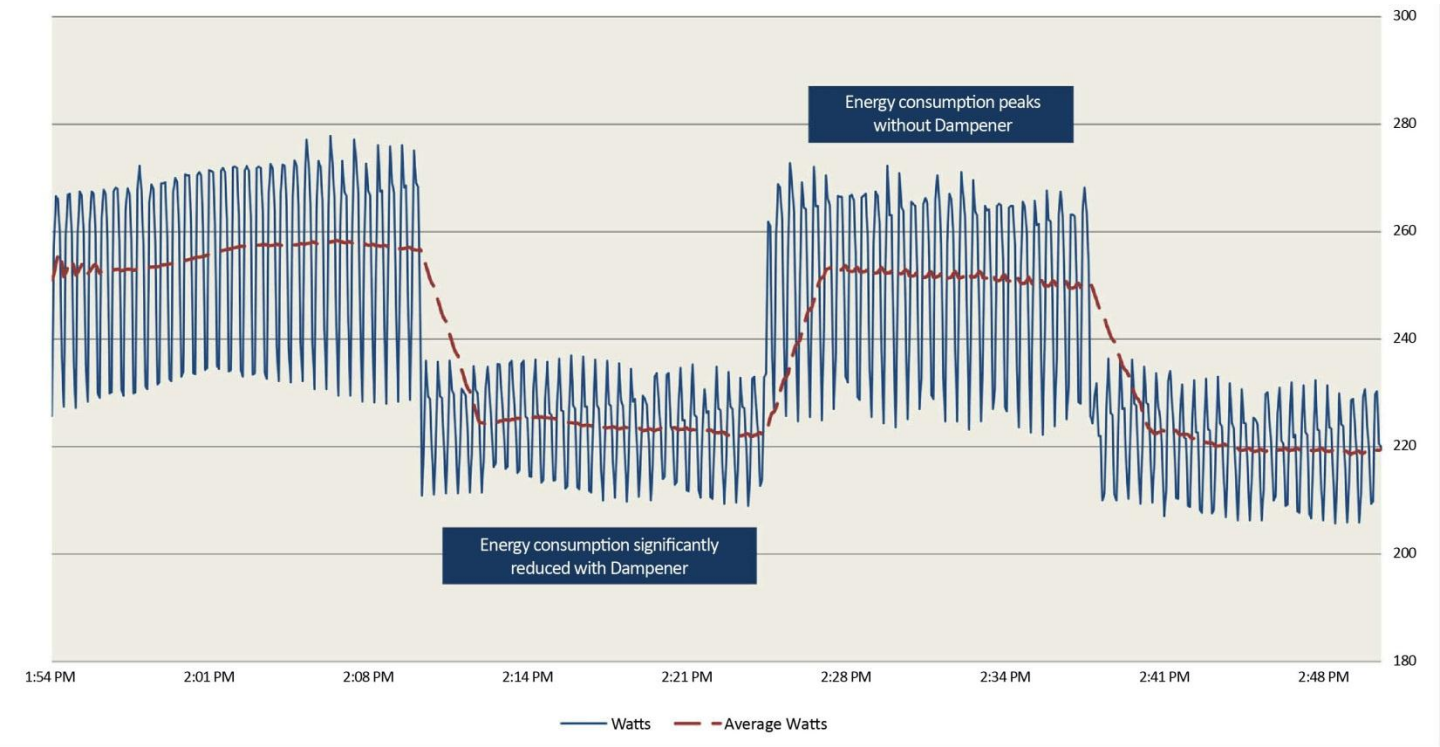
[1] *Pump Life Cycle Costs: A Guide to LCC Analysis for Pumping Systems, Executive Summary*. For more information and reference materials relating to pump performance visit the U.S. Department of Energy website at www1.eere.energy.gov/manufacturing/tech_deployment/pumps.html

Actual Test Results - 13% to 15% Energy Savings with BLACOH Pulsation Dampener



Since we began in 1976, BLACOH's progress and growth has been driven by product innovations designed to improve the overall performance and reliability of fluid processing systems. Our customers and partners can rely on us to carry on that tradition as we continue to invest in research and development to advance market growth for all.

For more information regarding this study or to speak with an experienced Customer Focus Team member, contact BLACOH at 951.342.3100 (toll free 800.603.7867) or email Sales@blacoh.com.

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