

Driflex™ Oil Conditioning System Operational Benefits

- Removes all free, emulsified and dissolved water from used oil
- Allows manufacturers to clean lube and hydraulic oils, maintaining optimum condition
- Economical, owner-controlled alternative to conventional oil dehydration
- Patented UltiDri® technology delivers reliable, high quality oil—even oil with extremely high moisture content
- Simple to install and operate; consumes a minimal footprint
- No risk of thermal degradation
- No routine operator intervention or maintenance required
- No moving parts, and no level or vacuum controls to maintain
- No water drains or oil heater
- Low cost of ownership; minimal operating costs
- No minimum volume required
- Easily filters many types of oil without cross-contamination
- Long service life and dependable operation



WHY DO BUSINESS WITH PENTAIR?

Broadest Line—Single Source

Pentair brings the broadest filtration offering in the industry – a single source for all your filtration needs

Lean Manufacturer

We strive for continuous improvement in cost, quality and delivery

Dedicated, Fast Customer Support & Application Engineering

We have dedicated staff to support and service your applications

Technology Research Centers

Advanced research results in greater innovation, technology and customized solutions for your applications



Pentair Industrial

1040 Muirfield Drive
Hanover Park, IL 60133

Toll Free 1.800.869.0325
Phone 630.307.3000
FAX 920.803.3565
support@pentairindustrial.com
www.pentairindustrial.com

APPLICATION SUCCESS STORY: SMITH & WESSON®

ROI in 2 Months! Smith & Wesson® Cuts Outside Costs and Recycles Oil with Driflex™ Oil Conditioning System

Smith & Wesson®, a well-known firearm manufacturer, saves more than \$48,000 annually and has improved the quality of the company's recycled oil since employing the Driflex™ Oil Conditioning System from Pentair Industrial. The new system paid for itself in only two months, both in cost savings and increased convenience.

Driflex™ Oil Conditioning System



Pentair Industrial

Since 1852, Smith & Wesson® has been associated with high-performance and high-precision firearms for safety, security and protection, as well as sport. To maintain efficient production speeds and keep up with customer demand, Smith & Wesson employs manufacturing processes that use approximately 30,000 gallons of machine lube oil per year, with 19,800 gallons recycled each year. Processing and recycling this oil became a significant burden, involving the excessive costs and inconvenience of third-party oil treatment processes.

Oil processing and recycling is an important part of numerous manufacturing processes, including those in the steel, molding, foundry, mining and power generation industries. The machines utilizing this lube and hydraulic oil require clean, dry oil for dependable operation. However, during use oil becomes contaminated with process particulate and moisture—causing wear and tear on machinery, and potentially leading to machine failure. Processing contaminated oil so that it can be reused is a common solution, as it saves considerable costs over oil replacement.

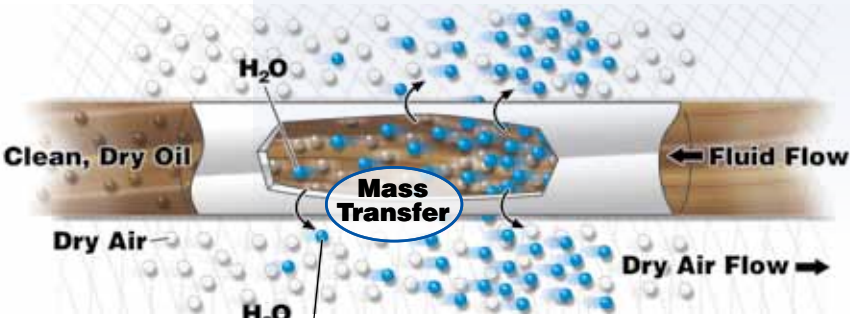
As with many companies, when the contaminated lube oil began to interfere with machine operation, Smith & Wesson® contracted with an outside service to filter, clean and dry the oil, removing all unnecessary moisture and contaminants. This oil processing and recycling program required Smith & Wesson® to accumulate and store 1,500 gallons of used oil over a two-month period. The company then enlisted the help of a mobile processor to treat the oil at a cost of \$4,375 every month. The total cost of this program was \$52,500 annually—a lower cost per gallon than oil replacement would run, averaging \$6 to \$8 per gallon for mineral oil and up to \$60 per gallon for synthetic oils. However, the still-significant expenses and inconvenience of using a third-party, led Smith & Wesson® to pursue a new oil conditioning solution.

A New Filtration Solution

MSC Filtration Technologies, a Pentair Industrial distributor, introduced Smith & Wesson® to the Driflex™ Oil Conditioning System, marking the beginning of a fast-tracked project with Henkel Chemical Management to evaluate the system. The Driflex system is designed to remove all free, emulsified and dissolved water from oil in batches of all sizes. The system initially appealed to Smith & Wesson® from a convenience standpoint: the system would allow the company to process oil in their own facility, on their own schedule and in virtually any volume they wanted. In addition, keeping the oil processing in-house would eliminate the costs of clean-up services associated with off-site processors or third-party truck-mounted vacuum dehydrator systems. Not only did clean-up services cost tens of thousands of dollars, but they also carried the risk that the oil would be permanently damaged and lost during the clean-up process. Along with eliminating this risk and additional cost, the Driflex system would improve overall oil quality.

The Driflex Oil Conditioning System couples Pentair's patented UltiDri® membrane technology with high-efficiency filtration to cost-effectively remove known, harmful contaminants from vital lubrication and hydraulic fluids. The system operates by flowing contaminated oil through a particulate filtration stage, followed by a membrane filtration and an air drying process. The result: both particulate and moisture are removed from the oil, and the oil is restored to optimum condition for reuse.

Smith & Wesson® processes lube oil in 250 to 300 gallon totes, replacing two to three totes—or 500 to 900 gallons of oil—per week. To service the oil, the company selected a 4 gpm Driflex Model #DF-04L4CS400, selected to meet their volume and processing time requirements. A Driflex system of this size is capable of processing the company's typical weekly volume of oil within a few days, with no outside schedules to accommodate or third-party expenses.



H₂O Removed
Free, emulsified and dissolved water is transferred from the oil to dry air through a patented dehydration membrane using no moving parts.

Pentair Industrial Driflex™ Oil Conditioning System at Smith & Wesson®



Overall Cost Savings

By employing the Driflex Oil Conditioning System in their operations, Smith & Wesson® has significantly reduced their oil processing and recycling costs. After purchasing the Driflex system, the company received a return on their investment in only two months. The savings continue, as the system's annual operating cost is \$4,500—compared to the \$52,500 Smith & Wesson® spent annually through an outside service.

	Monthly Cost	Annual Cost
Outside Service*	\$4,375	\$52,500
Driflex™ System**	\$375	\$4,500
SAVINGS:	\$4,000	\$48,000

*Recycling 9,000 gallons **Recycling 19,800 gallons

Solving Process Challenges

Despite the comprehensive capabilities and advantages the Driflex system offered, a few challenges remained. Unfiltered oil quality varies depending upon how many times it has been recycled in the past, as well as how much particulate and moisture it has accumulated over its service life. Smith & Wesson's® unfiltered oil presented a significant challenge, as it contained a fairly heavy load of fine metal casting and grinding dust: 350 mg/L, with particles ranging in size from 2 to 10 µm. This contamination prevented the Driflex system from providing optimum oil conditioning. To handle this heightened contamination, a duplex, prefiltration housing unit—Pentair Industrial Model #H8836—containing 5 µm Triflex™ Mega Cartridges was installed to treat the oil before it entered the Driflex system. This cartridge prefiltration system successfully removed the fine particulate before oil conditioning took place, allowing the Driflex unit to effectively remove moisture during the conditioning process.

Another difficulty arose when a process accident during the test period introduced a great deal of water to the unfiltered oil. After this incident, the oil's moisture content registered at 2 percent—which is 20 times higher than normal. Despite these unusual conditions, the Driflex Oil Conditioning System still delivered optimum results, simply taking several additional days to process the oil. Through continued recirculation, the oil was processed until the desired level of dryness was achieved—without interruption to Smith & Wesson's operation or oil quality.

An additional benefit of using the Driflex system is the ability for Smith & Wesson® to recycle smaller batches of oil, which would have not been feasible to process through the prior solution. Small batches were often discarded, as their low volume prohibited them from being stored; it was cost-prohibitive to try to accumulate enough oil from these batches to warrant outside processing. Smith & Wesson can now process and reuse oil in batches of all sizes, with no valuable resources going to waste—the value of which is still to be realized.

Acknowledgments: Pentair wishes to acknowledge Smith & Wesson® as well as Henkel Chemical Management for their willingness to share specific operational and cost details, which made this success story possible.