

Case Study 10

Injection Molding Waste Oil Recycling

Background

Injection molding machines use heat to melt plastic, hydraulic force to push the molten plastic into a mold and water to cool the mold so that the solidified plastic can be removed. Over time, leaks form and cooling water comes in direct contact with hydraulic fluid forming a cloudy oil (*sometimes milky during catastrophic leaks*). Water contaminated oil depletes some additives and reacts with others leading to the formation of degradation by-products. This results in internal corrosion, erosion and accelerated attrition from wear of critical components. It cannot be used for hydraulic systems and simply becomes waste oil which is expensive to dispose of and even more so to replace. A large Midwest injection molding facility was generating 4,000 gallons of waste oil per month and spending \$32,000 per month to replace it. Northeast Filter was contacted to provide options for reducing their run-away OPEX.

Solution

The VAS team collected operational data and performed fluid analysis on the waste oil as well as new make-up oil for comparison. The turnover of oil was so high that the additive package was not yet degraded in the waste oil so vacuum dehydration the best choice for recycling the oil. A vacuum dehydration system filters and heats the oil in a vacuum environment to flash off the moisture without oxidizing the oil. A capital cost justification analysis was performed and indicated a capital payback could be achieved in less than a year, but the vacuum dehydration system recommended had a very long lead time of 14 – 16 weeks. A similar rental unit was provided for proof-of-concept and to expedite cost savings recovery which they used until the purchased system was delivered. The new system arrived, and the customer informed us that the cost savings realized from the rental unit had already paid for the capital expense of the new unit with a capital payback in just 4 months.

