

# Case Study

*Des-Case's New RMF Varnish Removal System Achieves Remarkable Results on a Plastic Injection Molding Machine.*

## Introduction

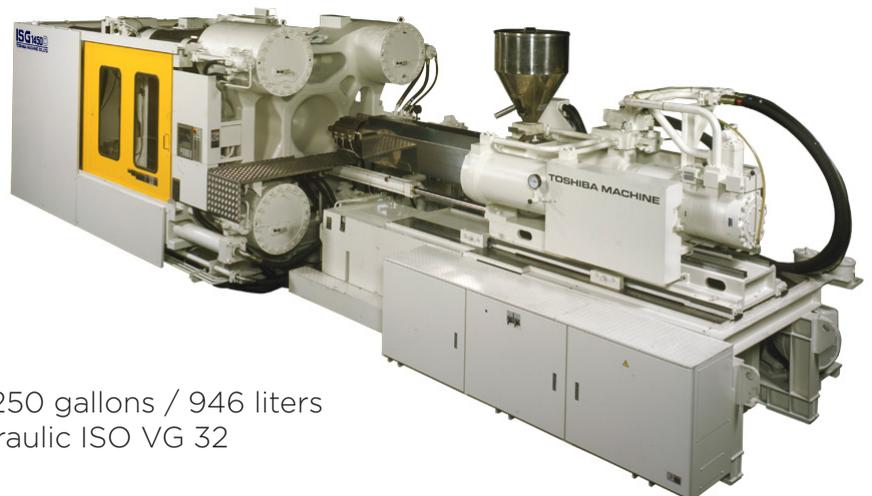
Hydraulic fluid is one of the most important components in an injection molding machine, which is why contaminated fluid cannot be overlooked. In fact, 80% of all hydraulic failures are caused by contaminated fluid. The most known types of contaminants are solid particles and water, but just as destructive for hydraulic systems is varnish.

The constant pressure and temperature fluctuations of the hydraulic fluid can lead to mechanical and thermal stress of the fluid. This results in a breakdown of oil molecules leading to the creation of a sticky residue (varnish by-products). This residue, combined with other contaminants, can cause friction and wear, which can shorten component oil life and cause unnecessary downtime of the system.

Additionally, the forming of varnish can be accelerated by a chemical reaction between metal solid particles and water. This results in corrosion of the components, changes in fluid properties and oil degradation.

## The Challenge

A large appliance manufacturer in the United States reached out to Des-Case regarding an increase in unplanned maintenance, blocked line filters and frequent oil changes on their Toshiba plastic injection molding machine. All of these symptoms were in line with severe varnish problems and was further confirmed by an oil lab analysis. The results of the test showed a Membrane Patch Colorimetry (MPC) value at a critical level of 63.4 and an ISO cleanliness level of 25/20/14.



**Make:** Toshiba  
**Oil Volume:** ~250 gallons / 946 liters  
**Oil Type:** Hydraulic ISO VG 32

## The Solution

To solve the varnish problem, Des-Case offered its Varnish Removal System, which acts as a kidney loop, continuously pumping fluid through the high-efficiency varnish removal cartridges.

The Varnish Removal System combines highly efficient varnish removal with oil quality monitoring and prevents varnish forming by removing solid contaminants and water.

The Long Fiber Cellulose / PP cartridges are specially designed for the removal of varnish by-products which are dissolved in the fluid. These cartridges adsorb polar acids by means of special compacted fibers which create an intricate internal flow path. Unlike other technologies, the cartridges do not add water to the fluid. They actually remove water and other solid contaminants.



## The Results

During the operation time of the system, samples were taken frequently and sent to a laboratory for analysis. Next to a standard fluid analysis, a MPC and gravimetric solids (MPC weight) test was done to measure the varnish potential and the results were phenomenal. After just 3 weeks of filtration, the varnish potential (MPC value) went from a critical level of 63.4 to 7.8 and the MPC weight decreased from .0182 to .0072 grams. In the following 5 weeks, the MPC dropped even lower to an incredible 1.6 and weight down to .0038 grams. The ISO cleanliness levels also dropped from an extremely dirty 25/20/14 to 17/14/11 in 3 weeks. 5 weeks after that the ISO code dropped even further to the target level of 15/13/10.

As the data shows, the cleanliness and health of the lubricant improved dramatically in a very short period of time and will greatly improve the uptime of the machine, allowing this manufacturer to realize significant savings in maintenance and repair costs.

	23-07-2019	13-08-2019	29-08-2019	18-09-2019
<b>ISO Code ASTM D7647</b>	25/20/14	17/14/11	18/15/11	15/13/10
<b>Component Life Expectancy</b>	15%	70%	55%	115%
<b>MPC Value</b>	63.4	7.8	3.2	1.6
<b>Level Rating</b>	Critical (>40)	Normal (<15)	Normal (<15)	Normal (<15)
<b>MPC Weight</b>	.0182 g	.0072 g	.0018 g	.0038 g
	