SYSTEM AVAILABILITY

Filtration & Condition Monitoring Improves Injection Molding Machine Availability

Technical Application Bulletin

PROJECT BACKGROUND

DISCOVER

- A manufacturer of plastic parts for the automotive industry has 16 injection molding machines in production.
- Frequent machine failures (servo and prop valves, pumps, etc.) caused by contaminated oil.
- The customer has no quality control program for the oil in the injection molding machines and no condition-based maintenance.
- Current machine availability is 85%-87%.

DIAGNOSE

- Reduction of unplanned machine downtime due to oil related issues.
- Increase machine throughput.
- Decrease part defects.
- Notification once fluid condition was outside of set limits.
- Reduce component wear and failure rates.
- Extend oil change intervals.
- Increase machine availability to over 90%.

INDUSTRIES

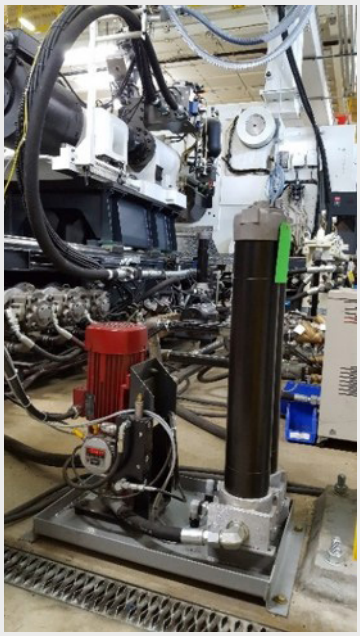
DESIGN

What We Did:

- Assessed their 16 various injection molding machines.
- Noticed that many machines were large tonnage and have large oil volumes.
- Determined the customer prefers one solution that can work across all machines.
- Took note that the customer was still taking oil samples via bottle sampling.
- Average machine oil cleanliness: 21/20/15.
- Target cleanliness: <16/14/11, Water content <40%.

Schroeder Filtration & Monitoring Solution

- Reviewed machine oil volumes, type and viscosity.
- Based on these results we offered a custom offline filter system with CS and AS sensors.
- Offline filter system is made up of the Condition Monitoring unit with integral pump/motor group feeding a G2K9127 filter assembly with 2x27" GeoSeal Quality Protection elements, 3 µm and 1 µm, in series.
- CS 1000, AS 1000, & filter switches to be monitored on customers existing machine monitoring software.
- Agreed upon oil condition limits and set accordingly.
- One unit was purchased and delivered for proof of concept.



DELIVER

- The offline filter system was installed on one problematic injection molding machine.
- The unit was left on continuous operation for one week.
- Samples were taken before and after filter installation. Particle counts and water content were also recorded from the on-board sensors.
- Customer was able to obtain their desired ISO cleanliness target of <16/14/11.
- Installation of offline filter systems on 16 machines has been completed.

Oil Before

Oil After

Oil After

Cost Per Year	Without G2K9127	With G2K9127	Savings
Production downtime caused by contaminated oil	$810,264	$373,968	$436,296
Labor costs caused by contaminated oil	$229,320	$105,840	$123,480
Repair Costs	$56,000	$33,600	$22,400
Replacement Components	$36,400	$14,560	$21,840
Oil Costs	$25,800	$12,900	$12,900

ROI

Reduction of oil-caused system downtime

By 54%

Oil Savings Per Year

10,000 liters

Cost Savings Per Year

$616,916

Max amortization time

4 months

Underlying values:
Cost of machine downtime: $265.00 per hour

Labor rate: $75/h

Hydraulic Oil (Esso Nuto 46): $1.29/L

Disposal of soiled oil: $0.43/L

PRODUCT SPECS

OLF Offline Filter Systems

Flow: 5-20 gpm (18.93-75.71L/min)
Relief Pressure: 85 psi (6 bar)
Ambient Temp. Range: 15°F to 175°F
Gear Pump: 75 SUS to 5000 SUS
Seal Type: Buna N

CUSTOMER BENEFITS

- Increased machine availability
- Showed automotive manufacturers continuous improvement, leading to future contract wins
- Reduced operating costs (components, oil, labor, etc.)
- Reduced part defects
- Increased profits

FURTHER APPLICATION AREAS

- Bulk oil supply systems
- Froming machines / Presses
- Blow molding machines
- Power Generation – control oil
- Steel Mills