PROJECT BACKGROUND

INDUSTRIES

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%.

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.
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.

**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

### 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

<table>
<thead>
<tr>
<th></th>
<th>Without G2K9127</th>
<th>With G2K9127</th>
<th>Savings</th>
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<tbody>
<tr>
<td>Production downtime</td>
<td>$810,264</td>
<td>$373,968</td>
<td>$436,296</td>
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<tr>
<td>caused by contaminated oil</td>
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<tr>
<td>Labor costs caused by contaminated oil</td>
<td>$229,320</td>
<td>$105,840</td>
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<td>Repair Costs</td>
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<td>Replacement Components</td>
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<tr>
<td>Oil Costs</td>
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