CONSERVATION OF RESOURCES

Removing varnish in oil of plastic injection molding machine

PROJECT BACKGROUND

DISCOVER

- The customer, a manufacturer of food packaging, uses food oil with low conductivity and low dissolving capacity for oil ageing products.
- Deposits and formation of oil ageing products after few operating hours
- MPC (membrane patch colorimetry) value > 40
- Competitor products used without significant improvement in oil service life

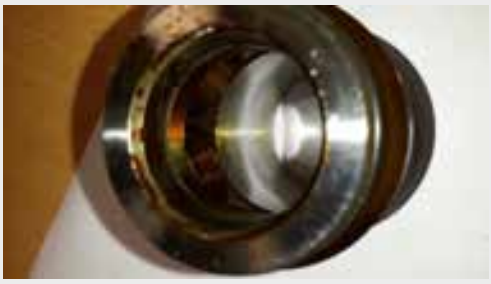
DIAGNOSE

- Extension of oil service life
- Reduction in oil consumption and costly oil change
- Increased system availability
- Permanent reduction in MPC value < 30
- Low investment costs

INDUSTRIES

DESIGN

- Initial situation: oil ageing products on tank wall and on valves of the plastic injection molding machines:

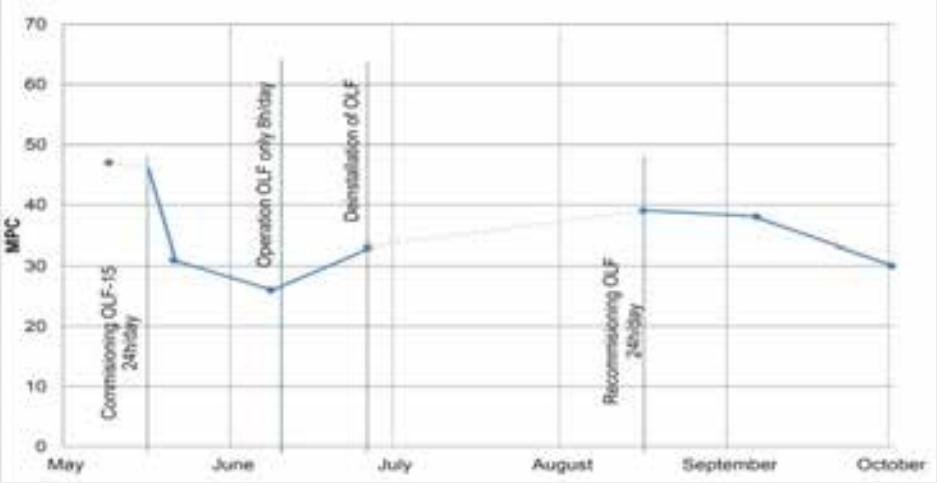


- To extend oil service life and reduce costs, the customer decided to test the Schroeder OLF15 offline filter unit on a plastic injection molding machine.
- The 2 µm Dimicron elements used are cellulose depth filters with a particularly high contamination retention capacity and an environmentally safe method of disposal.

- Laboratory analyses were undertaken at regular intervals before and after installation in order to assess the cleaning performance of the unit with regard to oil ageing products.
- Reducing the oil temperature from 117°F to 108°F the machine provided additional effective support for the separation of oil ageing products.
- A competitor's product was tested on an identical machine at the same time. The competitor's product also works with cellulose filters, although with lower flow rates. This product did not live up to expectations: the oil ageing remained at almost the same level.

RESULT

The lab analyses showed an improvement in the MPC value in the first sample just three weeks after the installation of the OLF15.



- The OLF15 was removed from the system for roughly one month. During this time, oil ageing products were not removed, or were removed only temporarily, which resulted in an increase in the MPC value. Once the OLF15 was put back into operation, the MPC value dropped significantly once again. In parallel, the oil manufacturer also observed an improvement in oxidation stability.
- So far it has been possible to extend the service life of the oil filling by 2 years. The OLF15 installation was thus amortised in little time.

Oil change (105 gal oil/machine)	Oil consumption per machine	Total oil consumption (5 machines)
Before: 1 oil change per year	105 gal / year	528 gal / year
After: oil change roughly every 3 years	35 gal / year	175 gal / year
Annual saving	**75 gal / year**	**353 gal / year**

The cost for 1 gal of fresh food oil is $43 / gal. For a tank with a capacity of 105 gal, an oil change costs roughly $15,000 (without taking into account labour, downtime costs, etc.)

KEY FIGURES

Oil saving per year

353 gal.

CO2 saving per year

2,800 lbs.

Cost saving per year (oil costs only)

>$15k

Amortisation time

10 months

Underlying values:

Costs for oil = $43 / gal (for new oil & disposal)

CO2 emissions = 7.8 lbs / gal oil

CUSTOMER BENEFITS

- Oil service life increased from 1 year to 3
- Operating costs reduced by using less oil and fewer oil changes
- Increase in plant availability
- Cleaning system efficient, in comparison with competition

FURTHER APPLICATION AREAS

- Plastics machine manufacturers
- Packaging manufacturers for food and pharmaceutical industries
- Manufacturers of medical equipment (e.g. dialysis machines)