Pall Supralon® filter element retrofits reduce Tier suppliers operating costs by 22%

CASE STUDY

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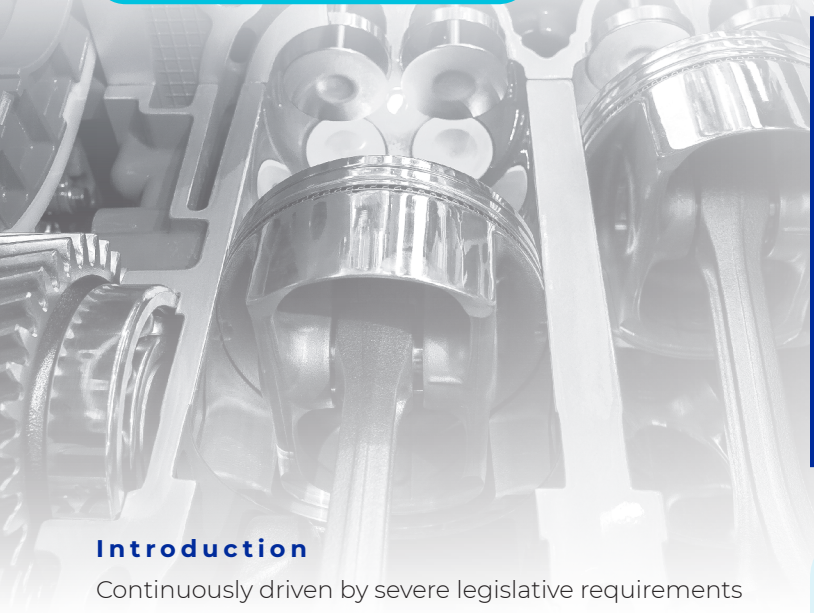


Background

The global internal combustion engine (ICE) market is expected to reach 370 million units by 2030 registering a CAGR of 9.3% during the 2022-2030 forecast period (Ref 1).

A spike in technological advancement in internal combustion engine in terms of reduced pollution, better fuel efficiency, and increased performance is expected to boost demand by 2030. Additionally, the lack of electric vehicle charging infrastructure worldwide coupled with increasing output of shale gas and growing demand for ICE in defense, mining and construction vehicles is further driving the market growth.

Introduction

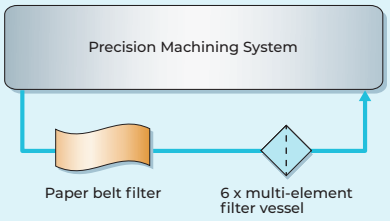
Continuously driven by severe legislative requirements for a greater combustion efficiency to minimize environmental consequences and exhaust emissions, Powertrain OEMs and Tier Suppliers keep improving the design of not only their components/systems but also their manufacturing equipment and processes.

In the ICE sector, the main challenge is to meet the new technical specifications without increasing manufacturing costs. Because of the scale effect, every production cost increase may immediately impact the overall profitability of the program. The production value chain is highly critical, especially in highly competitive environments like the automotive industry.

Problem

A major Tier Supplier in Europe producing critical parts for high-pressure injection systems, wanted to reduce the operating costs of its 4 precision machining systems. Onsite Process and Quality Engineers agreed to run a comparative field trial of the Pall Supralon retrofit filter product fitted in an existing filter vessel of its current filter supplier (Supplier A), operated for one year to have enough evidence to draw firm conclusions.

The key performance indicators to be tracked were the quantity of parts produced during typical service life between filter element changeouts, consistent fluid quality, and that the technical specification of the component was achieved.



Filter Operating Conditions

- Fluid: Low viscosity neat cutting oil
- Flowrate: 985 Lpm
- Pressure: 8 bar
- Temperature: 38 to 42 °C

Solution

Pall installed Supralon retrofit elements into the filter vessels, without need for adaptation, and took frequent measurements of the machine tool fluid cleanliness level circulating into the machining center. Until their changeout, the fluid cleanliness was very clean and consistently steady, typically ISO codes < -/9/6 per ISO4406, measured using Pall's PCM500 mesh blockage fluid monitoring technology so as not to impact the readings due to the presence of free air in the neat cutting oil.

The average annual production output achieved corresponding to the longer life between filter changeouts experienced with the Pall Supralon retrofit filter elements was **56% higher** than Supplier A under the exact same operating conditions.

Filter	Average Production per changeout
Supralon Retrofit (RS media grade)	75,000 parts
Supplier A (10µm)	48,000 parts

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Conclusion

Based on these comparative field trials results, the Tier Supplier upgraded its 4 x precision machining systems with Pall Supralon retrofit elements. Beyond relying on excellent filtration performance (efficiency and service life), this equated to the Tier Supplier **reducing its operating costs per machine by 22%**

Compared to Supplier A, Pall Supralon retrofit elements also exhibited a more predictable filter changeout date. Above 600 mbard, the remaining service life of Supplier A filters was inconsistent from one filter set to another, a situation that was very challenging for both its maintenance & procurement teams in terms of resource availability & inventory management.

Pall Supralon retrofit elements offered better operating guarantees, a more certain maintenance program as well as a simplified inventory replenishment process.

Cleanliness Code Ratings

Media Grade Code	Rating (µm $ß_{x(c)}$>2000 based on ISO 16889	CST* ISO Code Rating based on SAE ARP 4205
Z	3	06/04/<1
P	5	12/08/<1
N	7	14/09/04
S	12	18/16/08
T	25	19/17/12

**CST: Cyclic Stabilization Test to determine filter rating under stress conditions, based on SAE ARP4205. Note these ISO codes are laboratory measurements under standard conditions. Cleanliness measured in actual operation will depend on operating conditions and sampling method.*

Pall Supralon Elements

Ref 1: ReportLinker – Report ID: 6291040

PALL CORPORATION

Corporate Headquarters
Port Washington, NY, USA
+1-800-717-7255 toll free (USA)
+1-516-484-5400 phone

European Headquarters
Fribourg, Switzerland
+41 (0)26 350 53 00 phone

Asia-Pacific Headquarters
Singapore
+65 6389 6500 phone

Visit us on the Web at www.pall.com/industry
Contact us at www.pall.com/contact

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