

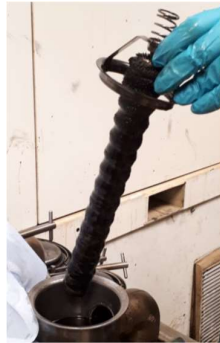


CASE STUDY

PROTECTING HIGH PRESSURE PUMPS FROM CONTAMINATION



(1)



(2)



(3)



(4)

Application:

Getting rid of burrs generated by previous manufacturing processes requires high pressure hydraulic systems (300-3500 bars) and small diameter spraying nozzles to remove the debris efficiently, in one pass.

Problem:

Particle **contamination** causes severe wear of ceramic pistons and seals, resulting in **pressure loss**, oil leakage and sometimes vibration of the pump. Contamination causes also erosion wear of the spray nozzles, causing blockages or randomly modifying the size of the orifice, decreasing the pressure or the directed flow. Loss of pressure results in reduced deburring efficiency and can stop the process due to machine's low-pressure alarm. This results in maintenance work, bottle-necking and increased costs.

Solution:

The initial filtration system (1) was composed of:

- On the recirculation loop: filter bags with magnetic bars (2) with 50, 10, 5 μm rating;
- On the direct line: filter bags with magnetic bars with 50, 10, 5 μm rating and a nominal cartridge filter of 20 μm as final filter.

The audit of the process has revealed the sensitivity of the components and concluded that the filtration solution was not enough to ensure a cleanliness level of -/15/12 that would be required in this case.

Considering the continuous ingestion of contaminants, high efficiency filters were selected. **Pall Athalon** filter (3), with laid-over pleat geometry, maximizes filtration area in a stress-resistant media with a fixed, tapered pore structure to provide consistent performance. Athalon 7 μm rating with a removal efficiency $\text{Beta}_{7(c)} \geq 2000$ was added on the direct line to protect the pump and the nozzles and to ensure the cleanliness of the fluid.

Since the Athalon filter size was insufficient by itself alone for the contamination in the system, **Pall SUPRADisc** filter (4), was added to the recirculation loop. It's special design combines large filtration area combined with adsorptive additives and resins, enabling it to remove a wide range of contaminants and greatly increasing the life of the Athalon filter.



Benefits:

- ✓ ISO 4406 oil cleanliness improved from 23/20/12 to 17/14/11, better than recommended cleanliness (-/15/12)
- ✓ Less maintenance work on pumps and nozzle
- ✓ Less downtime
- ✓ Better finishing quality
- ✓ Less scrap rates
- ✓ Reduced costs