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GNB Baffles Dramatically Reduce Backstreaming

While commissioning a large vacuum coater we encountered a serious problem with oil backstreaming from the halo-baffle-equipped 32 inch diffusion pumps. After only a few days we would see DC-704 silicone oil dripping from components situated above the throat of the diffusion pumps. This level of contamination was unacceptable for our process.

We surveyed the manufacturers of chevron baffles and selected GNB because of their low price and low-profile design. Their design made it easy for us to fit the chevron baffles between the pump inlet flange and the valve above. GNB quickly fabricated two of their 32" multi-coolant chevron baffles and shipped them to us. We removed the halo baffles from two of the diffusion pumps and replaced them with standard cold-caps. Then we installed the chevron baffles above the diffusion pumps and cooled the baffles with 15°C water. The only additional components required were some longer threaded rods for the pump's inlet flange and a short extension for the pump's foreline.

The results were dramatic. The backstreaming rate dropped to about 6% of the rate generated by the halo-baffle equipped pumps. Lower backstreaming rates could be achieved by cooling the chevron baffles to a lower temperature. However, this rate was small enough to be acceptable for our purposes. The surfaces above the pump went from dripping wet to faint oil deposits that were only detectable by weighing witness samples on sensitive balances.

The overall pump speed of the pumping system dropped to only 87% of the speed achieved with the halo-baffle equipped pumps. If we assume that the pumps were pumping at their rated speed of 25600 liter/sec, we calculate that the conductance of each chevron baffle is about 6500 liter/sec.

In conclusion, we found that for our system, we eliminated a contamination problem at a minimal penalty in the overall pump speed of our system by using GNB's chevron baffles.

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