

PRACTICE

# Minimal flushing quantities

Optimization of pumps reduces time and material requirements for color changes

**M**any paint shops still use commercially available piston pumps. High-pressure double diaphragm pumps are an alternative which promises material savings during flushing and also improves the spray pattern. These pumps are used successfully in the paint shop of furniture parts manufacturer Neelsen. Equipment manufacturer Wagner, in close cooperation with its partners Oltrogge and Venjakob, has once again turned the efficiency screw and optimized the “Cobra” high-pressure double diaphragm pump.



The use of high-pressure double-diaphragm pumps has also improved the spray pattern of automatic paint application at Neelsen GmbH.

BY JAN GESTHUIZEN

Neelsen GmbH is a classic medium-sized supplier that produces furniture parts such as fronts or trims at two production sites and delivers them to furniture manufacturers via a logistics site. This is partly done in batch size 1, which are produced and coated just-in-time. Painting is done in-

house: Around 40 of the company's 120 employees work in surface technology, as Frank Meyrahn, Managing Director of the owner-managed company reports. The company has two automatic coating systems in operation, but also still relies on manual application, for example for the filler. Both

water-based and solvent-based coatings are processed. A good two thirds of all furniture components are painted, the remaining third is foiled.

Before the changeover, conventional piston pumps were used in the company. However, these had disadvantages compared to the new pumps. For

example, the double stroke volume of piston pumps is around seven times larger than that of modern double diaphragm pumps for the same output, which results in correspondingly large flushing volumes. In addition, piston pumps have packings that can wear and clog. “At best, three to four

liters of flushing medium are required for the flushing process of such a piston pump," explains Markus Neundorf, Product Manager at Wagner. Even before the revision, the consumption of flushing material of the double diaphragm pumps was significantly below this value. "We wanted to massively increase the flushability, because these are avoidable costs in the flushing process," explains Frank Schleifenbaum, Senior Portfolio Manager at Wagner. Not only the costs for the flushing medium itself, but also the associated disposal and CO<sub>2</sub> emissions are unnecessary cost drivers, he says.

## Optimized inlet saves flushing agent

"We have optimized the geometry of the inlet so that the paint has even fewer opportunities to hide in corners or edges, which further reduces the need for flushing agent," says Frank Schleifenbaum. The improvement is based on a tip from Wagner partners Oltrogge and Venjakob, whose customer had noticed paint carryover with his higher viscosity material in the inlet area of the pump. As the partners appreciate the advantages of the "Cobra" pumps and are happy to use them for customers as well as in their own technical centers, they sought a discussion with the pump manufacturer Wagner. The joint constructive exchange ultimately led to the optimization, which Wagner implemented and introduced into series production in spring 2023. As a result, the required volume of flushing agent has dropped to less than one liter. The somewhat higher acquisition costs of a high-pressure double diaphragm pump compared to a piston pump should



Neelsen uses several high-pressure double diaphragm pumps from Wagner.

Photos: Wagner

pay for themselves quickly, calculates Frank Schleifenbaum: "If we assume flushing agent costs of five euros per

**Even conservatively calculated, a good 20 euros can be saved per color change.**

liter and save a good four liters during flushing, even with these conservative assumptions we come to a saving of 20 euros per color change, not including the avoided disposal."

## Flushing time has also been reduced

The lower flushing volume is also accompanied by a significant reduction in flushing time. Whereas a flush on piston pumps takes at least five to ten minutes, it is less than one minute on the revised "Cobra" pump, and even less than half a minute for non-critical color changes, the manufacturer reports. In the case of critical color changes on a piston pump, some parts such as the filter housing would also have to be cleaned by hand, explains Markus Neundorf. The significantly shorter flushing time is also a basic requirement for automation projects, he says. With their high cycle



Thanks to a tip from Oltrogge and Venjakob Maschinenbau, Wagner has significantly reduced the flushing quantities of the "Cobra" double diaphragm pumps.

times, these projects must hardly have any leeway for lengthy and sometimes manual flushing processes, which are common with piston pumps.

Frank Meyrahn of Neelsen relied on Wagner's high-pressure double diaphragm pumps as part of the purchase of a 3K mixing system, also offered by Wagner. He had noticed that this was often used by competitors, especially in Italy. He is satisfied. "An important factor for us is not only the material savings, but also the significantly better spray pattern," he explains. Because the pumps operate at up to 200 double strokes per minute, delivery is extremely consistent. "Thanks to the double diaphragm pump, we no longer have this jolt that we used to have to contend with," Meyrahn explains. In addition, the pump has proven to be very maintenance-friendly so far, and the support from the manufacturer is also noteworthy, reports the Managing Director. The good news for all users who already have the first generation of Wagner's high-pressure double diaphragm pumps in operation: The company offers a conversion kit to the new inlet geometry, so that existing customers can also benefit from the environmentally friendly and resource-saving revision.

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