

AQUEOUS INLINE CLEANING

Compact System for a Variety of Steel Parts

A manufacturer of rotary tables cleans its steel parts, which weigh between five and 150 kilograms, in a compact machine using a wet process. Even stubborn residues of anti-corrosion agents, oils and cooling lubricants that have dried on during storage can be removed gently and effectively.

Some are as tall as a person and have a diameter of four metres or more. They can only be moved using special cranes and just fit through the roll-up doors of the factory when fully assembled. The large rotary tables are the top of the range of products manufactured by Fibro in southern Germany, which includes tables for all types of application and in all sizes.

A cleaning machine (Elba model) was purchased in 2007 to clean the components of the smaller rotary tables using an aqueous process. The two-bath machine, which was produced and supplied by Mafac, has been used since then to clean steel parts with a diameter of 50 to 350 millimetres weighing five to 150 kilograms.

Integrated into the production line

Precision is of the utmost importance in the manufacture of the rotary tables. Accuracy down to the level of micrometres and arcseconds is required in all the phases of the production process, including the cleaning phase, which makes an important contribution to ensuring the reliability of the processes.

For many years, components at Fibro were cleaned manually, but this method was no longer able to meet the company's operational or quality requirements.



For cleaning purposes, the flange and the housing are fastened in the basket system with a special frame. This allows the benefits of the spray cleaning process to be exploited to the full.

The company's approach to cleaning has now changed radically. The decisive factors behind this change include environmental issues and the health of the employees. During a pilot project for a new assembly line, the new cleaning machine was purchased in 2007 and could easily be integrated into the company's production process. The machine is compact and self-contained. It is also very easy to use and keeps manual involvement to a minimum.

Steel components with complex shapes

The cleaning machine has become an integral part of the assembly line and is installed directly behind the warehouse.

The components are removed from storage, cleaned and moved on to the assembly process. This ensures that all the parts used in the process are cleaned before they leave the premises. The majority of parts for cleaning are made of steel and are contaminated with anti-corrosion agents, oils and cooling lubricants which have often dried on during storage.

The parts are generally between 50 and 350 millimetres in diameter and weigh between five and 150 kilograms. They are usually complex in shape and have many deep and sometimes narrow holes. For the cleaning process they are fixed with special frames into a basket system. This allows them to be cleaned



The cleaning machine is an integral part of the assembly line and is installed immediately behind the warehouse.



The baskets rotate in the opposite direction to the air jets during the drying process.

gently without damage or defects occurring. The operator can make full use of the benefits of the spray cleaning system with rotating baskets, which produces the best possible results.

Fibro's machine has a total of five cleaning programmes which run for between four and six minutes. Around 75 percent of this time is spent on cleaning and the remaining 25 percent on

drying. The two tanks of cleaning agent are heated to a temperature of 65 °C and are used first for cleaning and then for rinsing. According to Mafac, the spray process used both for cleaning and rinsing is unique. The basket system rotates in the opposite direction to the rotating spray system which is fitted with solid stream nozzles. The spray system is blown through between the two wet

cleaning phases in order to prevent carry-over of the cleaning agent.

The cleaning phase is followed by a drying phase with a pulse jet drying system. The components are dried with pulses of warm compressed air and then exposed to heated air. The baskets rotate in the opposite direction to the rotating drying system. As a result, the parts are dry when they are removed from the machine and can be processed directly without any further steps being needed.

Bath service life of two months

The cleaning agent in the machine, which is operated on a single-shift basis, has a service life of around two months. After about a month the content of both tanks is checked. Depending on the results of the test, cleaning agent is added or the water is changed. The first tank, the cleaning bath, has a capacity of 475 litres and contains a cleaning agent with two percent concentration. The second tank, the rinsing bath, has a capacity of 300 litres and uses a cleaning agent with a concentration of 0.5 percent. Coarse and fine contamination that can be skimmed off is removed using a coalescence separator. The oil and grease which is removed in this way is collected in a separate container. Both cleaning tanks have a single-stage pre-filtration unit.

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