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BIW Burger Industrierwerk GmbH:
Environmentally compatible
cleaning of high-precision
turned parts in a MAFAC ELBA



User Report

BIW Burger Industrierwerk GmbH

Environmentally compatible cleaning of high-precision turned parts in a MAFAC ELBA

Since autumn of 2011, the aqueous parts cleaning machine ELBA by MAFAC has been operating on the BIW shop floor in Welschensteinach, ensuring environmentally compatible cleaning of high-precision turned parts.

When you come for a visit the first time, you'll easily drive by the BIW manufacturing plant. You'll find yourself in a picturesque Black Forest village characterized by green pastures and some isolated farm houses. But Welschensteinach has more to offer: Right at the entrance to the village, there are some commercial buildings and two large factory halls. Here, the branch establishment of the BIW Burger Industrierwerk GmbH manufactures high-precision turned parts in a factory erected in 1960. In the autumn of 2011, the management of the supplier purchased the ELBA, an aqueous cleaning machine by MAFAC, to respond to the high cleaning requirements made by its customers. „Plus, this was our opportunity to implement the long-anticipated introduction of a cleaning system on an aqueous basis,“ says factory manager Thomas Kosch.

The branch establishment of BIW in Welschensteinach is a CNC turning shop and assembly operation. The company produces a variety of high-precision turned parts with many different geometries for a wide range of applications. The key customers are two leading global manufacturers of tractors and agricultural machines which count BIW as their top supplier. Furthermore, the 46 employees produce drives for motorcycle manu-

facturers, monitor arms for dialysis machines for medical engineering, and different components for measuring and control equipment, heating and sanitary installations, as well as aerospace and military engineering.

The bearing casings, axis shafts, guide sleeves, flanges, double nipples, bar head and other parts manufactured in Welschensteinach are made of steel, stainless steel, aluminium and brass. Following turning, the majority of these precision parts will go to the main BIW factory in Schonach for further machining. In preparation, the components which are contaminated only with drilling emulsion undergo intermediate cleaning. The balancer rings made of stainless steel are an exception. The components for electrical motor drives, manufactured with a high surface accuracy and true running accuracy, are dispatched directly to the customer's. This means that they must be absolutely free of residues. „The customer requires premium cleanliness. Following every batch, we have to do an ink test to check the cleanliness, and we must report the result,“ Thomas Kosch says.

The old parts washer in place in Welschensteinach was unable to meet these requirements. Thus, the management purchased the MAFAC cleaning system on aqueous basis. This was the motive for the investment – but the reason behind it was the change to an aqueous cleaning process which had been planned for months: „We wanted to reduce the hazardous substances in our factory and improve the environmental compatibility of our production,“ the factory manager says. For a number of reasons, the management opted



for the ELBA, the dual-tank system by MAFAC. The test runs done in the Alpirsbach Technikum were more than convincing for the cleaning and primarily for the drying results. Furthermore, BIW already had good experiences with MAFAC cleaning systems: A MALTA, the three-baths system by the Alpirsbach experts for industrial cleaning, had been working in the main factory in Schonach for years. „We did our first tests on this machine,“ Thomas Kosch explains.

Currently, not only the 1,800 balancer rings manufactured per week but the entire BIW product range is cleaned in the ELBA at Welschensteinach. This also includes bulk goods in small load carriers. To accommodate the wide portfolio, the machine has four programs: rigid basket, rocking 15 degrees, rocking 30 degrees, and basket receptacle system rotation. „At first, we entered a dedicated program for each part. But with more than 100 different components, this became too elaborate in the long run, above all since the procedures are often the same,“ Thomas Kosch says.

The uniform cleaning process is

divided in a wet phase and a dry phase. Since the components are only slightly contaminated with drilling emulsion, the cleaning phase is much shorter than the drying phase. The individual programs are mainly differentiated by the movement of the loading system. The motion of the basket receptacle system is adjusted to the sensitivity of the component to be cleaned. In this way, all process technologies provided by default in the MAFAC machine are used. When cleaning the highly delicate balancer rings, the basket receptacle system stands still while the spray system with its full-jet nozzles rotates. When the 15 degrees or 30 degrees rocking programs are run, the basket receptacle system moves in an angle of 15 or 30 degrees while the spray system rotates. When cleaning particularly robust parts, the MAFAC-patented basket receptacle system counter-rotates to the rotating spray system.

On average, the cleaning phase takes two to four minutes. The two holding tanks are always used in a cleaning – rinsing sequence. After the wet phase, there follows the drying phase with an average duration of five to seven minutes. Here,

the hot air pulse blowing system is employed which is installed in the ELBA by default. The workpieces are blown off by a rotating blowing system in a pulsed manner, followed by the application of hot air. During the wet phase, the basket receptacle system – analogue to the wet phase

called cleaning bath, which has a volume of 475 litres. The 300-litres rinse bath in holding tank 2 is mixed with the cleaning agent in a concentration of 0.3 per cent. „Basically, this just is a corrosion protection for the steel parts,“ Thomas Kosch explains. The baths are



– either moves not at all, moves in a 15 degree or 30 degree rocking motion, or rotates.

The ELBA in Welschensteinach is ready for three-shift operation „depending on the volumes we need to clean“. Every employee knows how to load it. A universal cleaning agent in a concentration of three per cent is added to holding tank 1, the so-

changed as soon as the results of surface test of the balancer rings after cleaning fall below the specified parameters. For coarse and fine separation of surface contaminations, the ELBA has a coalescence separator with floating suction device. The separated oils and greases are collected in a separate container. Both holding tanks are equipped with a one-stage pre-filtration.



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