



Parts Cleaning. Systems and Solutions.



HSM GmbH + Co. KG: Cleaning
rebuilt crusher rollers
in the MAFAC ELBA

HSM

User Report

Atlanta

Cleaning rebuilt crusher rollers in the MAFAC ELBA

Document and data shredders pursuant to the highest security standards worldwide, presses for innovative disposal concepts in the B2B sector, intelligent cutting machines of various dimensions: The medium-sized, family-owned enterprise HSM offers a huge range of products and services for contemporary office and recycling technology. When the company in 2005 started to manufacture and distribute so-called crushers, machines for perforating and crushing disposable drinks bottles, it found that a powerful and flexible parts washer was needed. After extensive test runs, HSM opted for the compact machine ELBA by MAFAC. Since then, the ELBA has been working in the Salem factory, providing reliable cleaning processes and clean components.

Crushers are the heart of recycling machines for disposable drink containers, such as PET bottles or aluminium cans. The crushers developed by HSM are based on special patented technologies. They have a minimum service life of one million PET bottles. The characteristic crunching noise you hear when you feed your empty bottles to the recycling machine gives the supermarket customer an idea of how powerful the crusher 'bites down' on the bottle. "Usually, the drinks containers are not washed before they are fed to the machine. This means that the cutting tools, above all the crusher rollers, are subject to high loads," Harald Schwelling, Head of Production in the HSM factory in Salem, explains. "In cooperation with our customers, providers of machine systems for disposable

drinks container recycling, we offer extensive service solutions for ensuring continuous operation on site. This also includes the provision of spare units in the form of new or of fully rebuilt machines."

HSM rebuilds the roller cutting tools in the Crusher Disassembly department where a team of four people is working. Per week, they rebuild around 120 cutting tools. Since 2007, the parts washer MAFAC ELBA has been an indispensable item on the shop floor. "After disassembling the unit, we first sort the assemblies or parts. Worn parts are scrapped. Parts fit for re-use are cleaned and recycled. The range is wide: from crusher rollers over sprocket and drive wheels to bearing plates and housing components made of sheet metal. Thanks to the ELBA's flexibility, all those different parts are cleaned reliably, giving us a safe basis for the next machining steps," Harald Schwelling says.

Innovative disposal concepts for office and recycling technology

At HSM's, the crusher technology is one of the comparably recent innovations. The company, which will celebrate its 40-years anniversary this year, was founded in Salem in 1971 by the engineer Hermann Schwelling under the name of Hermann Schwelling Maschinenbau (HSM). In 1976, it started to develop and sell the first HSM bale presses. From that time on, this product sector was developed further, up to the fully automated continuous channel baling presses for disposal of large volumes of recyclable production waste. In the late 1970s, HSM created another main pillar for the



company with the in-house development of the document shredder product range. The 90s were years of expansion: Factory 2 was built in Reichenbach/Saxonia mainly for the production of bale presses, and factory 3 in Frickingen for the serial production of office document shredders.

After the millennium, the family-owned business, which is certified to DIN EN ISO 9001:2000, got going with more innovations: From 2003 to 2007, it launched not only the cutting machines product line but also the patented crusher technology and the document shredder product line SECURIO, which meets the highest precautions pursuant to international security level six for the most sensitive documents. Today, HSM has a global staff of more than 600 employees, with an apprenticeship quota of more than 10%. While document shredders and cutting machines for office use are mainly distributed via dealers, the recycling solutions are distributed directly, for example to all major German waste disposal companies. With almost 30 service points all over Germany, HSM has a close-knit service network which ensures prompt support and fast delivery of spare parts.

Versatile cleaning programs for a wide range of components

“In addition to MAFAC’s innovative process engineering, we were convinced by their process expertise,” Harald Schwelling says. “The excellent cleaning results achieved in the pre-tests we were allowed to run in the MAFAC Technikum in Alpirsbach were a major decision criterion.” Based on the specific components presented by HSM, the MAFAC engineers designed the appropriate cleaning processes. Focussing on the process parameters treatment time and temperature and cleaning agent concentration, the fine-tuning was done in advance by means of small series. Harald Schwelling: “The ELBA even surpassed our expectations, in terms of the throughput times as well as of the quality of the results. And all this at an excellent price-performance ratio.”

Currently, the ELBA installed on the HSM shop floor washes various components of the crusher rollers, most of which are made of structural and tool steel and aluminium. Depending on the application, the parts are contaminated to various degrees. The residues of the dispos-

able containers and their contents must be cleaned off the crusher rollers, while oils and grease must be removed from bearing supports, drive and sprocket wheels. If necessary, the components are first manually dipped into a cleaning bath to remove coarse dirt.

The ELBA installed in the HSM factory has a total of eleven programs which are enabled via the operator-friendly MAFAC control. All programs use the patented process technology of spray-flood cleaning developed by MAFAC. The spray system with its full-spray nozzles counter-rotates to the loading system, which is likewise rotating. This provides for reproducible cleaning results, in particular with cleaning in flow direction for all conceivable sequences and angle situations. “We fix large-sized sheet metal parts and components with complex geometries in special loading frames; robust parts are loaded as bulk goods,” explains Heinz Kaergel, head of crusher disassembly. While the movement of the loading system is reduced to gentle rocking for some parts, he says, the 360-degree rotation is used to full capacity for most of the components.

The process times differ depending on the cleaning program. Around two thirds of the time fall to the wet phase divided in a cleaning and a rinsing process. After cleaning, drying follows which is a similarly important component of the overall process. The parts are dried via hot air pulse blowing: The parts are blown off with warm compressed air in a pulsed manner, followed by application of hot air. During this process, the loading system counter-rotates to the rotating blowing system. HSM uses the two holding tanks of the ELBA in a cleaning – rinsing sequence. For this reason, a cleaning agent is added to the 475-litre holding tank 1; the holding tank 2 with a capacity of 300 litres remains without additives. The bath service lives of the two holding tanks are around three weeks. For coarse and fine separation of surface contaminations, a coalescence separator with floating suction device is provided. The separated oils and greases are collected in a separate container. Both holding tanks are equipped with a one-stage pre-filtration.



HSM GmbH & Co.KG

Austraße 1-9 | D-88699 Frickingen

www.hsm.eu



Parts Cleaning. Systems and Solutions.

MAFAC - E. Schwarz GmbH & Co. KG
Max-Eyth-Straße 2, D-72275 Alpirsbach
Phone + 49 (0) 74 44 / 95 09-0, Fax 95 09 - 99
E-Mail: info@mafac.de, www.mafac.de

You can find more
user reports on our website
www.mafac.de

