



Parts Cleaning. Systems and Solutions.



Removing oxides thoroughly  
and economically -  
MAFAC JAVA and MAFAC PALMA  
in action at Roland Fleischer GmbH

Roland Fleischer GmbH

## User report

### Removing oxides thoroughly and economically

**The contract manufacturer Roland Fleischer produces hydraulic and control blocks in aluminium, cast iron and HYT 60. The aim is to guarantee high quality standards and short delivery times. In order to remove the strongly adhering oxides even more effectively after TEM deburring, the company has recently installed a cleaning system from MAFAC.**

Since 1984 the company Roland Fleischer GmbH from Mainaschaff has been active in metalworking and since 1988 has specialised in the manufacture of components for hydraulic engineering. Due to high cleanliness requirements, the family-run company got involved in aqueous parts cleaning at an early stage and found a reliable partner with the machine manufacturer MAFAC from Alpirsbach. First of all, a spray-flood parts washer type MAFAC PALMA was procured, which was soon followed by a second machine. With the acquisition of a TEM plant in 2013, which at that time was one of the largest plants in Europe, cleaning developed more and more into a bottleneck, so that a new system became necessary. In this case too, the decision fell on MAFAC. This time, a system solution was chosen in which two spray-flood parts washers are operated in series.

#### The requirements of TEM deburring

„Thermally deburred parts have special demands on cleaning. The important thing for us was that the workpieces could be cleaned efficiently using a reliable process,“ says Steffen Fleischer from Roland Fleischer GmbH. During TEM deburring, ridges and fraying of a workpiece are loosened with the aid of combustion processes, whereby the excess burrs oxidise with oxygen and burn. A strongly adhering oxide layer forms on the part surfaces, which is detrimental to subsequent

production steps such as coating, painting or welding. „Our customers rely on us to carefully remove the oxide layer and supply parts with high-quality surfaces without delay,“ Steffen Fleischer continues to explain. Machining with a TEM plant already aims at this mission and guarantees fast, effective deburring of complex workpieces while maintaining high quality and repeatability. Accordingly, the cleaning system should fit into this concept and allow for shorter cycle times.

Treatment is applied to cast iron and steel components weighing between two and 250 kilograms and which are very sensitive to shocks. „Particularly on cast-iron parts, the oxide settles over the entire surface and the finely pigmented dust penetrates deep into the pores and represents a particularly demanding cleaning task in the case of filigree bores or undercuts“, explains MAFAC sales partner Patrick Roth from Roth Industrievertretung in Biebesheim on the Rhine. Due to stringent environmental regulations and also to protect the 17 employees, the decision was once again taken in favour of aqueous parts cleaning: „Using a different process such as pickling, we could probably have solved the strongly adhering oxide much more quickly, but the price for this is high in terms of people and the environment. With aqueous parts cleaning, we can work in an environmentally friendly, safe and material-saving manner, which in turn is very important when it comes to meeting



An important element of the effective cleaning process is the customised transfer system with which the system solution MAFAC PALMA and MAFAC JAVA at Fleischer is equipped.



For years a well-rehearsed team when it comes to cleaning: Steffen Fleischer (left) from Roland Fleischer GmbH and Patrick Roth (right) from Roth Industrievertretung.

our customers' requirements," says Steffen Fleischer.

### Two-stage system meets cleanliness requirements

Since April 2019, the contract manufacturer has been meeting these expectations with the two-stage cleaning line from MAFAC, consisting of a MAFAC PALMA and a MAFAC JAVA. Both machines make use of the spray-flood process and double-bath technology. They are connected via a customised transfer system, so that the goods to be cleaned can be transported along automatically and a total of five washing baskets can be processed in one batch. Steffen Fleischer comments this as follows: „We deliberately opted for a two-stage system, as this allows us to connect four cleaning baths in series and, thanks to cascading, minimise the mutual impairment of the baths due to dirt ingress and media carry-over.“ In addition, the unit guarantees the required throughput time in line with the cycle time of the TEM system.

### Effective cleaning process to ensure shorter cycle times

The entire cleaning process is designed to be time-saving and efficient. The system runs in single-shift operation, with the shock-sensitive parts passing through the process as fixated parts that are individually placed in universal baskets. They are routed to the MAFAC PALMA and then to the MAFAC JAVA via the fully automatic transfer system. Because of the oxide layer and the necessary corrosion protection, the chemical cleaning agents had to be particularly fine-tuned. On Patrick Roth's recommendation, Steffen Fleischer opted for cleaning agents from Wigol. To start with, the parts are all derusted and neutralised in the PALMA after TEM deburring. For this purpose, the surfaces are first subjected to a mildly acidic cleaning bath at 60-65° C and treated with counter-rotating basket nozzle rotation during the spraying and flooding processes using the MAFAC process technology. After cleaning, the part surfaces are

activated by the de-rusting process, so that neutralisation is necessary. With the rinsing process in bath two, the parts are neutralised in order to avoid new reactions. Afterwards, a two-stage cleaning process also takes place in the MAFAC JAVA. In bath one the parts are cleaned with alkaline cleaner and in bath two they are treated with anticorrosive agent. This is followed by the drying process, during which the parts are blown off with pulsed preheated compressed air. Each individual cleaning and rinsing process is also followed by a short blow-off process in order to achieve the lowest possible carry-over to the next bath.

### Extended bath service life and increased productivity

Thanks to the new system, the process duration could be reduced by 50% with a cleaning time of two times nine minutes. At the same time, the system solution offers the advantage that it is easy to operate and can be used by all employees. This results in a high degree of flex-

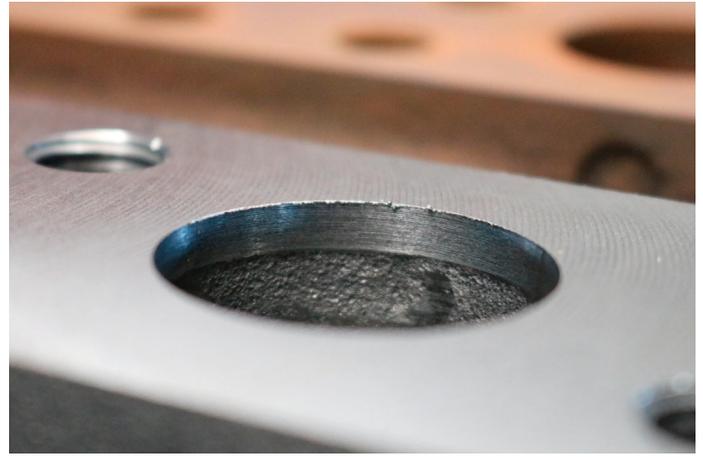
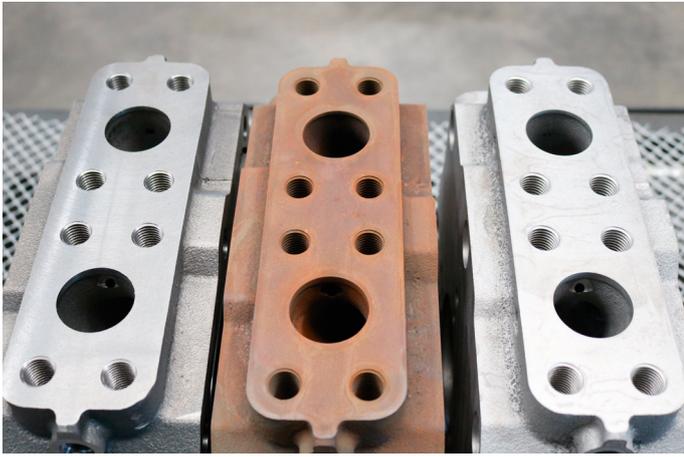
ibility in favour of optimised work processes. Another benefit follows from the extended bath service life. Whereas in the past the cleaning baths had to be changed on a weekly basis, today a bath change after four to five weeks is sufficient. This increases machine availability and reduces non-productive times. The cleaning unit also reliably meets the stipulated cleanliness target. Steffen Fleischer is very pleased: „With the system, we have so far fallen below all limit values, and for cast iron and steel parts the requirements are even exceeded. In addition, due to the modular design of the system, we are not only well positioned for current requirements, but are also well prepared and flexible for future demands“.



The workpieces, which are cleaned in the MAFAC system at Fleischer, are individually placed in washing baskets and fed to the cleaning process.



The customised transfer system between MAFAC PALMA and MAFAC JAVA enables the automatic transfer of the goods to be cleaned, so that five washing baskets can be processed in one pass.

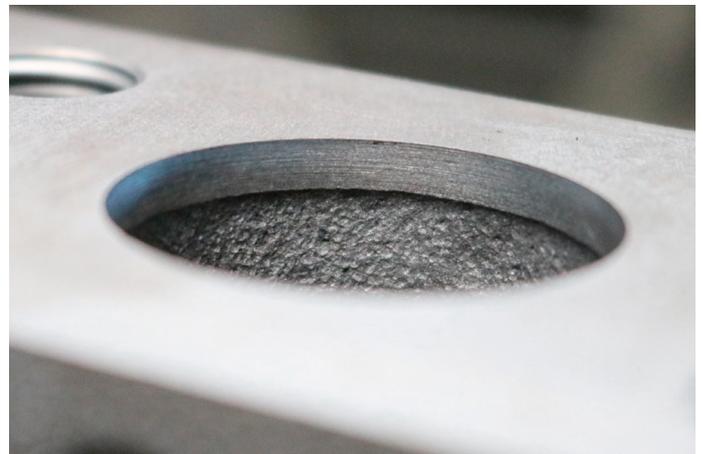


**Left:** Cast iron part before deburring. There are still process-related burrs on the surface.

**Centre:** After TEM deburring, an oxide layer firmly adheres to the part surface.

**Right:** After cleaning, the part can be fed to subsequent processes.

Part surface before TEM deburring: frayed ridges can lead to disturbances for the subsequent process or when using the workpieces in the hydraulic field.



Part after TEM deburring: the surfaces are completely coated with a firmly adhering oxide layer.

Part after cleaning: the oxide layer is carefully removed so that the workpiece can be fed to the subsequent process.



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