

# Shot Peening Solution for Larger Quantities of Aircraft Constructible Parts

**SHOT PEENING** technology is an important process, especially in the aerospace industry, where there is no room for error. It requires careful monitoring of all parameters that impact the work process and consequently the final result of the shot peening itself. This is why this process is usually performed on an individual workpiece so as to allow the process to be tracked for each product based on serial number.

But what about products that are installed in an airplane or in other machines in larger quantities? Or products of larger dimensions? For such products, conventional machines are not suitable or do not have a large enough capacity to meet production needs. Multiple machines are needed in such cases, which typically entails high investment costs.

Originating in the heart of Europe, FerroECOBlast® Europe develops solutions and manufactures machines for surface treatment processes; shot peening included. With expertise in this area since 1964, FerroECOBlast® Europe has made a name for itself among aircraft manufacturers and repair shops all around the world. The company's FAA-approved Shot Peening experts provide consultation, testing and solutions for any workshop—whether specializing in engines, landing gear, structural components, or composites—and increasingly for the additive manufacturing industry.

Additive manufacturing has become very popular in aviation in recent years.

The company's presence in Europe, the Middle East, Asia-Pacific, the United States, New Zealand and Australia goes to show that distance is no obstacle for their clients when it comes to choosing a reliable solution and quality support. That is why at FerroECOBlast® Europe we have tuned in to one of our customer's needs and requirements and developed and built for them a Shotpeening machine PEENLINE 2000 ECO that delivers high productivity for smaller workpieces and allows shot peening to be performed on larger products of up to 8 meters in length. These are long structural aircraft components that need to be machined with the utmost precision since as much as a single microcrack is enough to cause a disaster. For such workpieces, we have developed a pass-through-type machine which comes with a 2-meter-wide and 8-meter-long conveyor belt installed on either side.

As such, it allows the operator to load a large number of smaller-sized products or several larger ones to be processed simultaneously. It is precisely this functionality that allows the machine to be operated by a single operator. The machine housing features a built-in manipulator, which has four precision-controlled nozzles that cover the entire width of the conveyor belt. Thanks to such configuration, the machine



Shot peening machine PEENLINE 2000 ECO



*Manipulator with adjustable nozzles inside the machine*

is able to process a surface area of 16 m<sup>2</sup> over the course of 20 minutes. If smaller workpieces are used, a large number of them can be loaded onto the conveyor belt, depending, of course, on the actual workpiece size. This eliminates the need for handling individual workpieces when loading and unloading the machine and the loss of time while waiting for the machine to execute the manipulation. This configuration is the best choice for longer products (up to 8 meters) that require shot peening, since it also allows the simultaneous processing of several workpieces at the same time—so long as these are curved long items of different cross-sections or larger surface areas of sheet metal products.

Given the FerroECOBlast® Europe's machine design, a major challenge, of course, is to prevent the shot peening shots from escaping the machine housing. We managed to achieve this by installing cleaning tunnels on either side of the machine. Inside the tunnel there are sealing curtains as well as components for blowing the abrasive off of the products.

Other parts of the machine that apply the abrasive onto the workpiece and take care of the recycling of abrasive—such as dosing valves, vibrating screens, continuous pressure blasting nozzle, and other pressure and flow rate control and monitoring components—make sure the recycling and control of abrasive is performed in accordance with AMS 2431 requirements and in compliance with Nadcap standards. Because shot peening is mainly performed on aluminium products, and especially products made of titanium, the machine is equipped with ATEX anti-explosion ventilation systems, as titanium or aluminium dust is explosive.

Shot Peening training is regularly conducted at the FerroECOBlast® Europe facility under the mentorship of the highest professional authorities, giving FerroECOBlast® Europe staff and their partners the opportunity to receive regular training and obtain certifications in the field of shot peening. Our staff—from sales, development and assembly divisions—have earned the Federal Aviation Administration's course certification in shot peening levels 1, 2 and 3 as it is only by fully understanding the entire process that one can offer a quality solution to valued customers. ●



*Conveyor for long parts and ATEX filter system*



*Shot peening training for Shot Peening Level 1, 2, 3 at FerroECOBlast® Europe with Aljaž Molek (left) and Dave Barkley (right)*