



P R E S S   R E L E A S E

## **NEW CLEANING LINE IMPROVES MANUFACTURING PROCESSES AS WELL AS COMPONENT QUALITY**

Following the installation of an aqueous, ultrasonic washing and drying line from Turbex ([www.turbex.co.uk](http://www.turbex.co.uk)), manufacturing procedures have been streamlined at the Stonehouse, Gloucestershire factory of subcontractor, Norman Precision ([www.normanprecision.co.uk](http://www.normanprecision.co.uk)). In addition, there has been a marked improvement in the quality of its machined aluminium and stainless steel parts, particularly those that are subsequently plated or painted.

Automatic washing machines are increasingly taking over from manual degreasing tanks on shop floors for batch cleaning of components. However, Norman Precision's four-tank ultrasonic system from Turbex differs from customary stand-alone machines in that the operator can start processing the next basket of components while the previous load is being rinsed or dried in another tank.

Operations manager Bob Savory commented, "Another way in which our cleaning system differs from those run by most subcontractors is the way we have adopted it as the hub of our activities, linking the machine shop and dispatch.

“It has triggered a cultural change in our working practices that has led to a better understanding of our processes and how to improve them. Errors and rework have consequently been reduced to nearly zero.”

About 60 per cent of throughput at the factory is machined aluminium, the remainder being of numerous grades of stainless steel including 17-4PH, 303, 304, 316 and 4140. It reflects the large amount of work carried out for the aerospace, oil and gas, automotive, medical and defence industries. Many components produced are complex, so swarf tends to become trapped, making it difficult clean and dry them.

Previous manual removal of swarf using an airline, sometimes followed by processing in a rotary chemical system, struggled to achieve the required level of cleanliness. So washing of some components was subcontracted, while others due for anodising, plating, painting or powder coating were just cleaned superficially, as it was the responsibility of the external provider to prepare them for coating.

The effectiveness of the methods used by such third parties was variable, however. Now that Norman Precision is cleaning all components internally, it is able to control the quality of the finishing processes to a much higher degree. The result is an overall improvement in the quality of finished components delivered to customers.

All of Norman Precision’s machinists operate the Turbex line. As soon as a batch of components has been produced, it is taken to the cleaning section immediately for washing, the cycle taking less than half an hour. It avoids the previous situation of having aluminium parts stacked for hours

awaiting cleaning, which resulted in the water content of the coolant leaching silicon from the aluminium and pitting the surfaces of components. The problem was worse during minimally manned night shifts at the factory, as machined components were waiting around for longer.

Some stainless steel parts can rust if left for long in the presence of water, especially in places where it has been handled, so were also previously vulnerable to extended periods lying on the shop floor.

On arrival at the cleaning line, a batch of components is placed in a stainless steel basket, which has its base lined with a plastic mesh to prevent damage to the surfaces of the parts. With the help of an overhead gantry along which a pneumatic lifting device moves, the operator transfers the load to the four tanks in sequence. All are held at a temperature of 50°C, which accelerates the cleaning and drying while allowing the components to be handled immediately after processing.

Tank 1 contains tap water with detergent and an ultrasonic oscillator to assist removal of particulates and other residue. The action is enhanced by short, automatic movements of the basket up and down. This technique is copied at the two subsequent stages. The water is periodically cleansed by pumping it through a coarse and fine filter into an adjacent recirculation cylinder from where the tank is replenished. Meanwhile, the ultrasonics are turned off to save energy.

After 10 minutes, the basket passes to the second and third stages for one minute each. The first contains tap water agitated by compressed air

and the second is filled with water that is continuously deionised by an active carbon cylinder followed by an ion exchange resin cylinder.

The last stage is an air-assisted dryer in which components spend 10 minutes, after which all of the water has usually evaporated.

Occasionally, if parts contain particularly awkward areas, they may be returned for a further 10 minutes. Alternatively, there is the option to increase the temperature, but this complicates subsequent handling and is usually avoided.

Mr Savory continued, “Before installing the new washing system, we had been looking to upgrade component cleaning for some time and researched several alternatives.

“We shortlisted two but opted for the Turbex solution, partly because it had a smaller footprint and space is limited in our factory.

“More important was that operators could walk away from the cleaning line to do other tasks, whereas the other system was really for large-volume production environments and needed an operator in full-time attendance.”

In conclusion, he mentioned two further advantages of the Turbex cleaning line. First, customers are impressed when they visit the production facility at Stonehouse and see that Norman Precision takes this aspect of quality control seriously. Second, the equipment appears to consume little power. The subcontractor does not monitor it separately, but has noticed little increase in electricity bills since it was installed.



1. Bob Savory about to immerse a batch of machined stainless steel components into the first tank of the multi-stage Turbex Versa aqueous cleaning line at Norman Precision, Stonehouse.



2. After completing 10 minutes in the ultrasonic tank with detergent, the load is lifted into the second tank for rinsing in tap water for one minute.



3. Close-up of the stainless steel components about to enter tank 2, with the assistance of the gantry-mounted lifting device.



4. After the basket emerges from the second tank, soapy residue is removed using an airline to prevent undue contamination of the deionised water in the next rinse tank.



5. The load about to enter tank 3 for the deionised water rinse.



6. The fourth, drying stage about to start.



7. A view of the stainless steel components after drying.



8. Dry components being lifted out of the tank and deposited on a work bench.



9. As the components are at 50°C and reducing in temperature rapidly, they are conveniently handled without gloves into trays for delivery to the customer or an external finisher.

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