

It's True: Correct Use Of Ultrasonic Cleaning Really Can Reduce Cleaning Time By More Than 50%



The Product

The Raybond company, located in Saint Louis (France), specialises in bonding solutions that are mainly used to secure fastenings on windows and windscreens in cars. These adhesives are produced in a tablet form which is then inserted into a gun for easy application.

to the characteristics of one of the powders used, which is perhaps not that surprising given that it is an adhesive. The extent of the sticking on the punch tips can be seen below (Figure 1) and it is evident that



Adhesive Tablets



Figure 1

The Problem

The tablets are made by compressing a powder in a Fette press using tooling coated with their hard chromium coating. The formulation is very sticky due

to the hard chromium coating supplied by Fette proved insufficient in preventing compressed powder from becoming stuck to the punch tip faces. Raybond tried to remove the remaining stuck formulation from the punches using a Transonic 700H ultrasonic

cleaner filled with a simple water detergent solution. They used two cleaning cycles of 15 minutes each but this was not successful in removing the product completely and it was still very visible on both punch tips and in die bores. As a result, Raybond had to finish by cleaning manually with a nylon brush and isopropanol. This proved to be a very labour intensive and costly process, with the cleaning of one set of 60 punches and 30 dies taking a minimum of 2 hours 30 minutes for one operator.

The Trial

Based on I Holland's experience in tool cleaning and associated systems, Raybond consulted with us about application of the PharmaCare® 7 Step Process and I Holland were able to provide advice on how the cleaning regime could be improved. Raybond subsequently sent I Holland 10 contaminated punches that had already compressed several batches of adhesives tablets. A cleaning trial was then carried out using I Holland's Standard Ultrasonic Cleaner. The bath was filled with water, N10 detergent and KS corrosion inhibitor. At first, the punches were plunged into the cleaner for 5 minutes at 55°C and 45KHz frequency. The results, as we can see below, (Figure 2) were not completely successful with powder remaining on the punch tips.

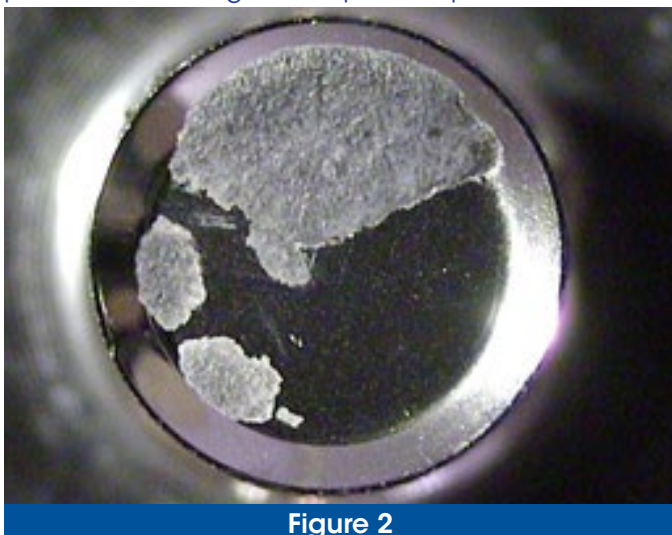


Figure 2

The Cleaning Solution

I Holland then moved on to a second trial. The punches were submerged for 10 minutes at 55°C using the 'pulse' function and a lower frequency (25KHz). When activated, the pulse mode produces intermittent high intensity spikes of ultrasonic power that can substantially improve cleaning. The picture below (Figure 3) shows that the powder was completely removed to the customers' satisfaction. Mr. Frenot, who is responsible for tooling maintenance at Raybond, was delighted and has since been able to reduce the time needed for punch and die cleaning by at least 50%.

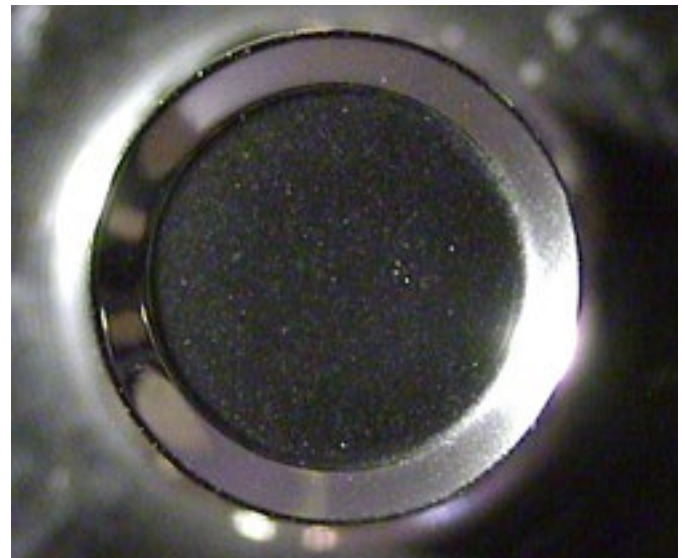


Figure 3

ONGOING ACTION

While the current solution for this problem is a refinement of the ultrasonic cleaning process, I Holland will work with Raybond on eliminating sticking using the PharmaCote coating range. This would further reduce cleaning and press downtime, therefore maximising tooling productivity.