**Fritz Jaspert KG**

**WAFFLE MOLD CLEANING CASE STUDY**

Increase productivity, quality and product safety while reducing costs

**COMPANY**
Fritz Jaspert KG

**APPLICATION**
Waffle mold cleaning

**COLD JET SYSTEM**
Aero 80FP

**BENEFITS**
- Cleaning time reduced by half.
- Less downtime and less waste.
- Investment amortized in less than one year.
- No wear or damage to the molds, making them practically unlimited in use.

"BEFORE WE NEEDED, DEPENDING ON THE SYSTEM, BETWEEN 30 MINUTES OR ONE HOUR FOR CLEANING. THIS CLEANING TIME REDUCED BY HALF WITH THE COLD JET DRY ICE BLASTER."

**THE SITUATION**

Frija waffle bakery, Fritz Jaspert KG was founded in 1913 in Westphalian Hamm, Germany. Today it is one of the leading ice cream waffle factories in Europe. The family-owned company employs around 100 employees and their range of about 200 different products is certified by the International Food Standard (IFS). The company exports their products to the United States, Canada, Australia, New Zealand, Libya, Iraq and almost all European countries. Their products are produced at 34 fully automated, highly modern production plants. The capacity of the baking machines is 240,000 waffles per hour.

**THE PROBLEM**

The waffle structure and designs are created by the engravings in the baking molds. In order to ensure product quality and product safety, regular cleaning of the molds is a must. Till mid-2016, the company was using costly angle grinders and brushes.

"Depending on the production plant and the product, the molds were cleaned at least twice a week," said Kevin Zalewski, operations and maintenance manager at Frija. "In order for the employees to be able to continue cleaning, the systems had to be stopped and cooled down. It was also partially necessary to dismantle the molds when cleaning them. It was very time- and personnel-intensive as well as stressful for the employees. In addition, the engravings have been damaged over time, requiring costly rework or completely new forms."

In order to ensure that no waffles are delivered with impurities, which could be caused by abrasive wire bristles, a large number of the waffles were disposed of after restarting the baking machines. Therefore, the company strived to make cleaning more efficient and employee-friendly.

"In recent years, we have been experimenting with dry ice blasting, but it did not produce the desired result," said Zalewski.
In the middle of 2016, tests were again carried out with dry ice cleaning devices from two manufacturers. Because of the superior cleaning performance and the large reduction in cleaning time, the company purchased the Cold Jet Aero 80FP. The compact, robust and mobile device can easily be transported from one production machine to the next. The system works with 3mm dry ice pellets (−79°C), which are produced as a byproduct of chemical or industrial processes and are purified for cleaning.

The pellets are accelerated to supersonic speeds with compressed air and are blasted onto the molds. When the dry ice hits the surface, a combination of kinetic, thermal shock and thermal-kinetic effect occurs. The latter causes the pellets to sublime under ambient conditions - from the solid directly to the gaseous phase. They expand within a few milliseconds to a volume of up to 700 times. At the impact point, this results in a “microexplosion” that spreads over the surface. This “explosion wave” has a very efficient lifting force, which carries the contaminant from the baking molds.

“Earlier, we needed between 30 minutes to one hour for the cleaning, depending on the plant, now we reduce the cleaning time by half with the Cold Jet dry ice system,” said Zalewski.

Furthermore, the downtime of the systems are shortened because the molds can be cleaned while hot and still in the production line. All this contributes to a noticeable increase in productivity. Since no cleaning residues were left on the molds, the waste was significantly reduced.

The Aero 80FP is used at Fritz with three different nozzles. Including flat nozzles, which have three and two inch blast swathes for fast and efficient cleaning of even areas. The Fragmenting MERN nozzle can carefully clean sensitive and difficult-to-access mold areas, such as fine engravings.

“The dry ice no longer causes any wear, abrasion or damage on the molds and engravings, so that they are practically unlimited in use,” said Zalewski. “If we take into account the savings that result from this, the investment in the dry ice cleaning system will pay for itself in less than a year.”

For reliable and easy handling, the device has an adjustable dry ice and compressed air supply via the patented Cold Jet Sure-Flow system. The system consists of an isolated, free-swinging hopper, from which the dry ice is guided radially to the compressed air stream (blast process). This prevents clogging and freezing.

“With the Aero 80FP, we found a solution that makes cleaning more efficient and employee-friendly and helps us to optimize product quality, safety and economics,” notes Zalewski.