

CLEANING OF BAKING MOLDS, PLATES AND CONVEYOR BELTS

Damage- and residue-free processing with low energy consumption



bakeLINE optics cleaning a wafer oven during operation



The laser cleans the baking molds without touching them and makes chemical or brushing processes obsolete. The process consumes only little energy. In many cases, the intervals of energy-intensive maintenance can significantly be extended or even replaced entirely.

Among materials for laser cleaning, metal molds and plates have proven particularly suitable. Especially cast-iron or chrome-plated surfaces and structured molds with residues of burnt-in oil or grease showed great results.

In contrast, the process turned out to be less efficient when cleaning residues of meat and chocolate, powdery and inhomogeneous layers, or materials with a layer thickness greater than 1 mm.

During maintenance (off-line)

Laser cleaning can be performed either during the baking process or during the maintenance phase. ONE powerful laser system is sufficient for several baking lines. For off-line cleaning, the baking lines are equipped with an adapter that couples the laser to the various stations. The lines can be cleaned semi-automatically within a few hours during the production break. Depending on the laser power of the basic unit and the degree of contamination, area rates of more than 15 m² per hour can be achieved, for instance on wafer molds.

COMMON APPLICATIONS

- Molds for ice cream cones and wafers
- Molding tools in clamshell ovens
- Rolls in drum ovens
- Conveyor belts
- Industrial baking plates



BAKING MOLD CLEANING

During the baking process (in-line)

For manufacturers of ice cream cones and wafers, cleanLASER provides in-line solutions. The circulating baking mold is permanently being laser-cleaned between the removal of the baked goods and the application of the dough for the next baking process.

The laser beam does not clean the entire oven in one pass but distributes its cleaning power to millions and millions of microscopic cleaning points with each circulation. As a result, the oven remains uniformly clean without losing the lubrication of the waffle iron that is necessary for the baking process. This technique guarantees not only a constant baking and product quality but ensures a permanently clean oven.

The laser system can be integrated into the baking line, quickly and easily. The damage-free use of the laser has been proven by both long-term experience and scientific analyses, regardless of the use of uncoated cast-iron or chrome baking plates.

BENEFITS OF INLINE-CLEANING

- No interruption of the production and no disassembling of the molds necessary - conservation of energy and time
- No more downtime - a cleanLASER system usually pays off quickly
- Adhesion lasts several months
- No need to add more and more oil or fat in order to avoid „sticky“ products
- Constant product quality due to consistently clean baking plates and molds
- Cleaning process is independent of oven speed - rates up to 10 cm²/s are possible



A laser system for integration in "hot" wafer ovens can clean tunnel ovens, even if the opening for the baking plates is significantly restricted

OVENS FOR SWEETS AND ICE CREAM WAFERS

Common wafer ovens of the established manufacturers offer a large opening angle of almost 90 degrees that provides easy access for the cleaning laser. For tunnel ovens, used in the production of ice cream wafers, cleanLASER has developed a special cleaning solution, referred to as coneCLEAN.

Two CL 20 low power laser systems, each equipped with a heat-resistant optics, are permanently installed in the oven. They continuously clean both passing top and bottom plates up to a width of 225 mm. The compact laser optics can also be integrated into other baking systems, like drum or circular ovens.

In order to prevent the optics from overheating during baking operation, the laser system incorporates an integrated water cooler. The cleanLASER "heatshield" concept ensures years of continuous usage and decreases the contamination of the protective glass considerably. The coneCLEAN system works particularly well with common cast-iron wafer molds.

Once set up properly, the laser eradicates residues of common dough types, making the scraping of the baking plates obsolete. This technique protects the plates and prevents erosion of the wafer structure.



Heat-resistant laser optics in continuous operation

CLEANING OF FLAT WAFER OVENS

cleanLASER offers not only stationary optics with a wider beam for the production of ice cream wafers. Installations with optimized mirror technology and moveable axes serve the particular demands of flat wafer ovens. After each rotation of the oven, the laser beam is being shifted automatically.

Both the optics and the complete drive technology are housed in a compact wedgeUNIT, which can be modularly installed in common ovens. Needless to say, the entire package is thermally insulated and designed to be steadily used in a hot oven.

The integrated operating concept features a standardized interface for flat wafer ovens.

This cleaning solution has already been implemented in many ovens of the leading manufacturers and has continuously been operating worldwide.

Over a period of 20 years, the cleaning process has been proven damage-free by scientific tests.

CLEANING OF FLAT WAFER OVENS

Complete solutions from a single source



Flat wafer oven with large plate and small opening angle



Integrated wedgeUNIT

Oil and grease residues on the baking molds are removed solely with the aid of focused light, without causing chemical waste or abrasion. Thus, the laser process protects the environment and significantly extends the service life of molds and baking plates.

The permanent usage of the laser combats any kind of critical contamination. The steady "patina" on the baking pans ensures an optimal baking result - even in continuous operations over months.

CLEAN TECHNOLOGY – GREEN TECHNOLOGY

The energy-saving cleanLASER process combines sustainability and economic efficiency.

Both managing partners of cleanLASER have been awarded the German Environmental Prize for the eco-friendly process.

SPECIAL FEATURES OF LASER CLEANING

- **No erosion (damage) on the baking plates**
- **Energy-efficient cleaning**
- power consumption < 1 KW
- **No need for chemical cleaning or brushing processes**

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PLEASE CONTACT US – WE ARE HAPPY TO ADVISE

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cleaning with light

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