

Major advantages

- Complete production lines, ready to install and operate;
- Fully automated process;
- Minimal amount of operating personnel required;
- Minimal installation time, easy to re-install at new location;
- Large scale process technology available also for smaller capacities;
- Minimal oil volume in system/ low turn-over time;
- Minimum water consumption due to unique counter flow technology;
- Excellent process control due to multi-flow fryer design;
- High level of equipment quality and excellent service support;

Description of the system

BMA/Florigo is one of the leading manufacturers of production lines for potato chips worldwide. Standard Potato chips production lines are available from 300 kg/hr to 2,000 kg/hr output capacity (based on 20% DS in potatoes). Production machines and complete production lines for larger capacities are available on special request.

Our world-wide experience has led us to understand the specific needs of processors to produce the best quality potato chips. Our reference list ranges from start-up companies in emerging markets to multi-national snack companies.

Whereas often the fryer is considered the heart of the potato chips line the proper preparation of the potatoes is equally important. Therefore we have put a lot of effort in the optimization of the washing, destoning and cutting processes to increase the yield, to minimize the organic load on waste water and to improve the quality of the end product. Many orders from leading potato chips producers worldwide indicate the high quality of the BMA/Florigo pre-lines for potato chips factories.

For many years already the BMA/Florigo potato chips fryers have been considered the number one in potato chips frying. As a standard, the potato chips production lines are equipped with a Multi-Flow potato chips fryer.

Typical potato chips fryer arrangement



Description of the Basic-Line Multi-Flow Fryer

The frying oil is circulated through the heat exchanger, which has been designed to provide a gentle exchange of energy. The hot oil is injected into the fryer at three or five different positions, depending on the capacity of the machine. The oil is taken out at two points.

At each point the volume of the hot oil can be adjusted, the setting monitored and the temperature of the oil being taken out recorded to ensure a flexible adjustment of the fryer to variations in potato quality.

Major advantages:

- Much better and more consistent potato chip quality compared to single-flow fryer.
- Less dependant on the quality of the potatoes
- The average oil velocity in the fryer is half of that of a single-flow fryer, resulting in better retention time control, because the difference in velocity between product and oil is smaller.
- Due to the lower oil velocity, oil turbulence at the surface is less, which also reduces oxidation with oxygen from the surrounding atmosphere.
- Flexible adjustment of the temperature in the last content
- Lower final temperature to reduce discoloration of the final product for chips with relatively high sugar content.
- Lower final temperature to reduce acrylamide.
- Higher temperature to keep the fat content of the final product at a minimum without a high-infeed temperature, which is detrimental to the FFA content.

New High-Line Zonal Flow Fryers

Whereas the Basic-Line fryers cover the requirements of most of our customers, the High-Line fryers were developed with a view to the top-segment of the market, i.e. for customers with special demands.

Rising quality requirements, e.g. with regard to the reduction of trans fats stimulate the development of new fryers. BMA/Florigo now offer the newly developed zonal-flow fryers for potato chips. The zonal flow principle has so far mainly been used in the French fries production.

Description of Zonal Flow Fryers

The zonal flow principle means that there are multiple oil inlets and outlets distributed over the length of the frying kettle. At the end of each zone an oil outlet drains the relatively cold oil, taking fines with it. Right behind the oil outlet freshly filtered and heated oil is injected. The shape of the oil inlets eliminates the so called hot-spots and reduces the formation of acrylamide.

The number of zones varies with the capacity of the fryer. In order to further optimize the oil temperature profile the quantity of oil that is taken out through the outlets is controlled by variable-speed pumps. State-of-the-art flow simulation programs were used to improve the oil flow in the frying kettle in order to reach a very uniform heat transfer to the product and even product flow in the free-flow zone over the whole width of the frying kettle.

Advantages of High-Line Zonal Flow Fryer

- Superior, very stable products quality
- Temperature profile adjustable to product quality
- Reduction of trans fat formation
- Reduction of acrylamide formation



Technical specifications of Basic-Line Multi-Flow Fryers

Model	AC300	AC600	AC1000	AC1500	AC2000
output capacity chips(kg/h)	300	600	1,000	1,500	2,000
input capacity potatoes (kg/h)	1,200	2,400	4,000	6,000	8,000

Based on 20% dry matter in potatoes

Technical specifications of High Line Zonal Flow Fryers

Model	AC1000Z	AC1500Z	AC2000Z	AC3000Z
output capacity chips(kg/h)	1,000	1,500	2,000	3,000
input capacity potatoes (kg/h)	4,000	6,000	8,000	12,000

Based on 20% dry matter in potatoes

Application, major advantages:

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- Fully automated process;
- Minimal amount of operating personnel required;
- Minimal installation time, easy to re-install at new location;
- Large scale process technology available also for smaller capacities;
- Minimal oil volume in system/low turnover time;
- Minimum water consumption due to unique counter flow technology;
- Excellent process control due to multi-flow fryer design;
- High level of equipment quality and excellent service support;





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