

# INDUSTRY SEGMENT PROFILE – FROZEN PIZZA

Dorner

## Segment Overview

Frozen Pizzas are offered in many different varieties. While there are several brands that are distributed nationally, a large share of the marketplace is made up of regional brands. The industry landscape can be broken down into four (4) distinct categories:

- *National Brands with their own production facilities*
- *Regional brands with smaller scale production facilities*
- *Generic/private label brands produced at contract manufacturing facilities*
- *Artisan brands that are produced in small runs often using labor intensive facilities*

The largest producers achieve an output of up to 200 x 12” round pizzas per minute, while small operations may produce at rates as low as 10 pizzas per hour. Due to competition in the marketplace several of the larger regional brands have built factories with production capacity similar to the national brands. These facilities will typically provide contract manufacturing services for both generic/private label products and also final packaging services and distribution for artisan brands. This allows them to recognize efficiencies through higher capacity utilization and economies of scale.

As with most food industry segments the market is becoming increasingly fragmented. Many of the regional brands are competing with the national brands by offering “Super-premium” product as well as pizzas for niche markets, such as gluten free or vegan offerings. There is also strong price pressure in the market and many of the private label brands try to compete by offering value-priced offerings.

Another element in the competition for consumer taste is a great deal of experimentation with different types of toppings, sauces, and crusts. This is forcing the manufacturers to adapt quickly and make equipment purchases that will offer them the most flexibility.

## Typical Manufacturing Process

In general, frozen pizza lines are subdivided into several sub-systems:

- Crust Preparation
- Sauce Preparation and application
- Par-Bake process
- Application of toppings
- 2nd Par-Bake process (optional)
- Freezing
- Packaging



Some of the sub-systems such as crust preparation and sauce preparation may be outsourced. There are several food processors that focus solely on making crusts or sauces, which are shipped in bulk to the pizza manufacturers.

Most of these production lines resemble an assembly line where ingredients or components are added at stations along a central conveyor. Sauce is typically applied using an automated process to ensure consistent amounts of sauce and to tightly control the cost per unit. For slower speed production lines toppings may be added manually by workers located along the conveyor. They apply ingredients from bins similar to the way a RTE line operates. Higher production volume operations have added automation that varies in sophistication and speed.

## Regulatory Concerns

Depending on the toppings on the pizza, the production operation will be subject to USDA and/or FDA regulations or both, or FSMA regulations for bakeries. Pizza with meat on them are subject to USDA inspection while cheese pizzas fall under the authority of the FDA. Facilities must be registered and they are subject to inspection to ensure they comply with the regulations for their type of facility.

Other 3rd party agencies that will have an influence of the design requirements include NSF and third party inspection agencies. There are several 3rd party agencies that have similar - but not identical – guidelines and standards for production. The customers of the manufacturer may require certificates of compliance or inspection documenting compliance with SQF, GFSI, BRC, or AIB standards.

From a food safety standpoint the two principal concerns are preventing microbial contamination and ingredient cross contamination that can result in undeclared allergens in a product.

## Business Issues

Companies in the Frozen Pizza Market Segment face several overarching business concerns that will influence their buying decisions.

- Their production lines must be flexible to accommodate an ever changing mix of products. Consumer tastes and food trends will drive the type and mix of ingredients used in preparing the foods. Companies must be able to respond quickly or face losing market share.
- Current labor markets are very tight. Manufacturers are having a hard time finding not only skilled labor for positions such as maintenance or supervision, but also for direct labor on the production floor. Turnover is very frequent and work areas need to be reconfigured frequently to accommodate the dynamic number of workers on the line. Production areas need to be set up to allow the workers they have to be as productive as possible.
- Ergonomic issues are avoiding employee turnover and worker injuries. Repetitive motion injuries are common for long term workers. This can result in worker's compensation claims and rising insurance premiums. The work can be very physically demanding if work spaces are configured poorly, which also impacts employee turnover.
- The need to provide a wide variety of products for different customers creates a higher risk of cross contamination. Product changeovers happen more and more frequently and the lines must be cleaned effectively. This process needs to be as fast as possible to ensure maximum production availability.
- Waste issues can be a drain on profitability. Their production systems must be set up to add their ingredients with the least amount of spillage or damaged product. During sanitation cycles water usage and chemical usage are costs that need to be managed. Equipment that is difficult to clean not only results in longer

sanitation cycles and the accompanying labor costs, but it can also mean that the factory has to use more chemicals and pay higher surcharges on their wastewater stream.

- To ensure profitability manufacturers closely track the application of the various ingredients to ensure that the pizzas met with required weight, monitoring the amount of higher value ingredients so that the unit cost is kept low without the risk of shipping underweight product.

## Production Challenges

Pizza makers face several unique challenges based on the fragility of the product and the way the product changes as it goes through the production process. Raw dough presents different issues than par-baked crusts, which in turn is different from flash frozen product or packaged product.

One of the key limiting factors of a pizza production line is the rate at which the toppings can be placed on the crust – starting with sauce. The most efficient way to precisely control the amount of sauce is by using a dosing machine called a depositor. This machine dispenses a specific amount of sauce to the pizza crust and there are physical limits to the amount and the speed that individual pizzas can be “sauced”. The type of saucing equipment has a significant impact on the layout of a production line. Some units operate continuously, allowing the crusts to pass underneath without stopping. Others work intermittently, which requires precise indexing of conveyors and positive control of product location.

In order to achieve higher production rates multiple depositing heads are used on a line. Depending on the throughput of the line the additional heads may be placed in series, or they may be configured in an array, which requires multiple lanes of crusts.

Other topping applicators have similar considerations. However, they are typically not the limiting factors on production throughput. The exception to this general rule is for unique artisan toppings which must be applied manually. In these cases, the line layout must accommodate enough space for the number of workers needed to apply the toppings along with space and structure for staging the ingredients for the operators to use.

As pizzas are manufactured they will go through a series of temperature extremes. This means that there will also be local variations in the operating environment. Areas adjacent to the ovens will be much hotter and may require the user of special materials, while areas adjacent to the freezers will have the potential for frost build-up, or loose ingredients becoming frozen to mechanical components, which can impact machine performance.

On higher speed production lines with multiple lanes of products, merging and dividing the production flow is a delicate process. The pizzas will have different product handling characteristics depending on where they are in the production process. And once all toppings are applied the products must be handled gently to ensure that none of the toppings are dislodged and that the shape or appearance of the product is not distorted.

Due to the wide range of ingredients used for toppings inspecting pizzas presents another set of challenges. All Pizzas are checked for weight. In some cases underweight products will be re-worked manually so reject mechanisms have to be fast yet gentle. Foreign matter detection is also challenging. Currently metal detection is the most commonly used method to detect contaminants. Some plants are also using vision systems to ensure that the products are the correct shape and size so that they will be appealing to the customer and they will fit in the packaging. In general, the most effective methods of inspection require a single file flow of product.

Prior to entering the freezer pizzas are typically sprayed with a fluid that will help ensure that the topping ingredients freeze securely to the pizza; typically referred to as misting. This reduces the potential for ingredient loss in the freezer or in the final packaging process. This process also makes handling the products a little easier for merging, collating, and inspection. The trade-off is that this can also result in a build-up of excess ingredients on the conveyor.

Once the pizzas are frozen most manufacturing operations have a fixed time period that they will allow for final inspection and packaging before returning them to cold storage. This is commonly referred to as open time. Accumulating large numbers of frozen pizzas is unusual. However, there is frequently some type of buffer zone to allow product to continue discharging from the freezer in order to ensure temperature balance in the freezer and to also avoid having to shut down upstream processes. This may be in the form of a simple divert arm or it may involve a configuration of conveyors to create a longer travel path for the product to allow time for the downstream stoppage to be corrected.



## Factors Influencing Purchasing Decisions

The base conveyor systems needs to be very robust. Ingredient stations might be reconfigured multiple times throughout a shift and ingredient containers are replaced frequently throughout a production run. The system must be designed so that totes, work tables, and staging fixtures for packaging materials can be swapped out quickly and safely in lines with manual toppings.

On less automated lines flexibility of the ingredient staging system is a key consideration. Modular accessories that can be attached securely and relocated easily are an operational advantage for the customers. In addition, some customers may have an interest in having extra sets of mounting systems so that they can be sanitized offline. Having the ability to do the sanitation offline allows for faster changeover from one product to another and also reduces the number of workers required for product change.

Operator safety is important. Customers are interested in finding the best balance between open designs for ease of sanitation and having sufficient guarding so that operators cannot be harmed by the conveyor system. Line workers wear lab coats, which can get caught on moving belts or rotating shafts.

Cleanability is a key consideration. Frozen pizza makers want to be able to reliably sanitize their conveyors and ancillary equipment thoroughly in the shortest amount of time, using the minimum amount of water and chemical agents. To streamline the sanitation process it is commonplace for the cleaning team to run the belts during the sanitation cycle – even if they are raised from the bed with belt lifters.



Speed and ease of tear-down and re-assembly is important. Customers prefer systems that can be broken down and re-assembled intuitively, utilizing interchangeable parts that do not require specific orientation.

## How Dorner Delivers Value for the Customer

AquaPruf and AquaPruf Ultimate conveyors offer a wide range of belt options to address the specific needs of the customer's application.

AquaPruf and AquaPruf Ultimate conveyors are designed to allow users to thoroughly and effectively clean the conveyor in the shortest amount of time using only as much water and chemical agents as necessary.

Tool-less disassembly eliminates the need to bring in tools that could carry contaminants from outside the room.

Dorner has developed a highly flexible mounting rail system for all of the different types of work station accessories. No tools are required to install or relocate the work stations.

Work station accessories are designed to be ergonomically efficient.

Robust conveyor framework and supports stand up to the most demanding production environments.

Patented sprocket alignment guides makes it easier and faster to break down and re-assemble modular belt conveyors.

Solid conveyor frames with cut-outs for cleaning balance accessibility and safety for operators

Dorner equipment designs comply with very stringent regulatory standards – USDA Red Meat and Poultry.

Only Dorner backs their equipment with a 10 year warranty.

In addition to Dorner's standard products there is a dedicated Engineered Systems Group that can modify standards, create entirely new equipment, or integrate third party equipment to ensure the right technical solution for the customer's specific requirements.

Dorner has extensive experience providing Pizza production systems. Dorner does not have the learning curve other companies may need to deliver solutions that fit customer requirements from day one.

Dorner is one of the very few conveyor companies that are ISO 9001:2015 Certified. This means independent authorities have verified that Dorner has established and maintains a quality management system for the Design and Manufacture of Precision Conveying Equipment for Industrial, Packaging and Sanitary Conveyor Automation Needs. Customers are assured that Dorner will consistently deliver high quality, reliable equipment – even when it is a unique solution for a customer's requirements.



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