

## CORN PRODUCTS PROCESSING SYSTEMS

### WE KNOW WHAT TO DO WITH CORN



#### WHAT IS THE DIFFERENCE BETWEEN A TORTILLA CHIP & A CORN CHIP?

The process for manufacturing corn and tortilla chips is similar, but simmering and soaking times will vary considerably. Another difference is that tortilla chips are baked in the oven and then fried, while corn chips only go through the frying process.

Corn is the primary grain farmed and produced in the world, and has been used for centuries in Central and South America to produce products such as tortillas, tacos and corn chips. The growing diversity of the global population in the early 1900's saw many people exposed to different foods and flavours, with Mexican based foods such as fried tortilla chips gaining popularity in the United States.

Since the 1930's, corn based products have increasingly become part of the mainstream snack food industry, with fried tortillas evolving into mass produced corn chips, and are now one of the world's most popular snack foods. As one of the most established equipment manufacturers for food production equipment, Heat and Control has been involved with producing corn based snack foods since the 1950's and are a one stop shop for specialised processing, seasoning, inspection, conveying, weighing and packaging for corn products.

#### HOW DID COMMERCIAL PRODUCTION OF CORN BASED PRODUCTS START?

Tortilla chips and Tostados, a type of tortilla chip, were sold in the US in the early 1900's in restaurants in Texas near the Mexican border. I.J Filler, a salesman travelling along the Mexican border, was eating tostados in a small Mexican restaurant in San Antonio, Texas, when he conceived the idea of manufacturing a rectangular shaped corn chip. With the help of his father who designed a rudimentary grinder and rolling machine for the grinding and forming of the corn meal, Filler was granted a Trademark for corn chips in 1932.

A man named Elmer Doolin was also in Texas at this time and bought the rights to a ribbon shaped corn chips recipe from a Mexican man, as well as his retail outlets and production equipment. He started producing and selling this product as 'Fritos', with sales averaging \$8.00 to \$10.00 a day, yielding a \$2.00 profit. By the mid 1930's, all the key elements for the development of the snack food market were in place, and the catalyst that created a boom industry was the introduction of the corn chip.

Today, corn based snacks foods are a multi-billion dollar global industry. Tortillas and taco kits are

seeing record purchases, with over 1 billion units sold in 2016 in the United States alone according to a report by Chicago Based research firm Information Resources, Inc. U.S. sales for Hispanic foods and beverages are expected to hit \$11 billion in 2017, up from more than \$8 billion in 2012, according to a report from Packaged Facts. Heat and Control has long provided the equipment and means for snack food producers to keep up with demand of this burgeoning market by providing complete systems for tortilla and corn chips, taco shells, tostadas, corn tortillas, extruded corn snacks and fried corn kernels.

### HOW ARE CORN-BASED SNACK PRODUCTS MADE?

The production of corn based snack foods has come a long way since Elmer Doolin started selling corn chips from his garage. Today, there are simple manually operated lines, semi-automatic or fully-automated systems available for corn based snack products. Heat and Control will assess the needs of the individual customer and design a tailored production line to suit the production requirements and growth goals.

For processors, cooking corn allows the development and maintenance of a unique, consistent flavour and texture for their corn and tortilla chips, taco shells, tostadas and tortillas. Over the years, Heat and Control has perfected the operations of corn preparation to assure consistent quality of corn products for our customers, giving each product a unique, tasty flavour.

Given the large variety of corn-based products, there are different processes and equipment for each line of snack foods. Corn preparation can be quite complex if you do not have the correct equipment. There are many variations in finished corn products - with the shape developed to suit the purpose - corn chips for dipping are produced with a curve to make it easier to pick up dip; chips that are used for Nachos are larger to accommodate salsa, guacamole and melted cheese.

### CORN COOKING PREPARATION

The corn used should be whole grain, free of foreign material and contain a minimum of cracked kernels. Most manufacturers use yellow corn rather than blended. However some processors use corn variety such as white or blue to differentiate their finished product. It is essential that clean, uniformly sized and impurity free corn is used in the mixture. The cleaner the corn is before cooking, the better the masa is later.

Broken pieces of corn will absorb larger quantities of water and will cause wet, sticky masa, making it difficult to cook and resulting in a poor product.

The first step is to produce a dough, or masa. When cooking the corn, it is important to hydrate the corn kernels and loosen the pericarp (external skin) and to increase the moisture content of the corn by adding water. Calcium Hydroxide or "food grade lime" as it can sometimes be referred to, must also be added to the corn to improve the flavour, as well as weakening and removing the outer layer of the corn pericarp so the chip is crispier. The addition of lime also controls the microbial activity, improving shelf life.



Heat and Control has a wide range of equipment to produce the Masa and ensure consistent quality. Our processing systems including Masa Production Systems and Corn Washers that enable food manufacturers to duplicate the masa recipe every time. Extruders and Sheeters accurately form and transfer masa without altering the texture and flavour of the product.

### CORN OVENS AND FRYING

When toasting tortilla chips, a belt moves chips through the oven and exposes both sides of the chip to the oven burners. The oven burners crust both sides of the chip and toast the bottom side of the chip using burners located under the top belt. This seals the chip and prevents the chips sticking to the belt after the first transfer point. The quantity of toast marks varies depending on what the market desires.

In the frying process, moisture is removed from the chip and replaced with oil to develop the texture, flavour and appearance of the chip. Heat and Control cooking systems, such as fryers and ovens, can evenly distribute heat and give precise control of cook time and temperature. We have a range of Tortilla Toaster ovens for uniform toasting of tortilla and taco shell production.

Our world class frying systems can provide precise control of oil flow, temperature and cook time for corn chips, tortilla chips and tostadas. We also have a specialised range of frying systems for taco shells and tostados.





## SEASONING AND CONVEYING

Conveying corn based snack foods is a delicate process, as the product can break and the all important seasoning can fall off if lower quality conveyors or vibratory systems are used. Heat and Control conveyor systems can reduce product breakage by up to 60% using FastBack® Horizontal motion. The gentle slow-forward, fast-back motion prevents product damage and seasoning coating loss. The Heat and Control seasoning applicators, such as our FastBack Revolution® Seasoning Systems, uniformly apply seasonings with less breakage and waste.

Corn snack foods are an ever-changing industry, as consumers

are exposed to new products and flavours. Since 1950, Heat and Control have committed to assisting food manufacturers respond to market changes by continuously improving equipment, and providing our customers with the best equipment and technology to increase production levels.

Our complete Corn Product Systems are designed by engineers with years of experience in snack food products, making Heat and Control the leading single source supplier of all the equipment you need to process, season, weigh, inspect and package the highest quality corn chips, tortilla chips, and other corn snacks.

<http://www.heatandcontrol.com/tortillachips.asp>



## ABOUT HEAT AND CONTROL

### BENEFIT FROM OUR GLOBAL EXPERIENCE

HEAT AND CONTROL is a world leading equipment manufacturer of food processing and packaging systems.

Our global team can support you with equipment demonstrations, engineering and applications assistance, project management, installation, training, service and spare parts support wherever your plant is located.

### PROCESSING, PACKAGING AND INSPECTION

Turnkey solutions offering a single source of supply

Being a single source supplier allows us to provide holistic solutions designed and manufactured specifically to meet the requirements of each individual customer now and in the future.

In order to provide our customers with the best solutions, we work with the world's leading inspection equipment manufacturers, including Ishida and CEIA.

With a team of expert engineers and service technicians, we partner with our customers every step of the way, from design, to onsite training, as well as future servicing and maintenance. Our thought leadership within the industry and ability to provide solutions for all steps of the manufacturing process ensures our customers have the highest level of flexibility, investment security, consistency, and success.

