

Applications Notes

Moisture and oil measurement in Tortilla chip Production

Moisture control is critical throughout the production cycle; from the raw corn ,nixtamal and masa to the tortilla chips, it ensures the final product has a consistent texture and appearance and maximizes shelf life.

Oil content also requires controlling as it affects the flavour of the chip. This measurement is made at the fryer exit and it can be used to control the temperature of the fryer or the duration of the chips in the fryer. Additionally, oil is measured post seasoning drum to ensure a consistent level of seasoning is applied to the chips.

Tortilla Chip Manufacturing Processes

A wet corn milling process is used to create the masa or dry masa is purchased and mixed with water to create the masa dough. The coarse masa is mixed and kneaded into an elastic masa which is extruded and fed through a sheeter prior to being die cut and baked for 30 seconds. Baking imparts alkaline taste characteristics and also serves to reduce moisture and oil absorption during the frying process. Following baking, the tortilla chips are cooled to allow equilibration which leads to less blistering in the rapid frying process. Oil based liquid seasoning is sprayed on the hot product in rotating drums. Product is cooled to ambient temperature and immediately packaged to prevent moisture levels rising above the desired 1.5%.

Gauge Location

The MCT 300 or MCT 360 can be positioned on-line pre-oven, if a measurement location exists or can be established such that the gauge views continuous product, at the exit of the fryer, and at the exit of the seasoning drum.

Note that a vortex cooler accessory is advisable at the fryer exit location, and may also be required at the oven location depending on the ambient temperature.

If there's no possibility of measurement pre-oven on-line, a rapid measurement can be made at-line using an MCT 600. The MCT 600P can be configured to measure moisture in masa and tortilla chips at intermediate stages of production in addition to oil and moisture in the fried and seasoned product. Measurement at-line can be carried out on whole product but measurement accuracy is improved by grinding the product in a food processor first.

Measurement Performance

Product/location	Moisture %	Moisture Error	Oil %	Oil Error
Masa	47- 52%			
Pre-oven				
Exit-fryer	<2%	+/- 0.15%	22-24%	+/- 0.5%
Exit-Seasoner	<1.5%	+/- 0.15%	22-45%	+/- 0.5%