Automated Inspection & Intelligent Material Handling for **Tortillas**

MONTROSE
TECHNOLOGIES INC.

www.montrose-tech.com

Montrose inspection and handling systems provide a complete inspection and rejection solution created just for tortilla manufacturing lines. Receive comprehensive statistical analysis of variability while removing human involvement from inspection and rejection.

A high speed, turnkey system that allows you to:
1. Assure quality on a 100% monitoring basis.
2. Remove individual defective and non-conforming product from the line.
3. Monitor process statistics to pinpoint causes of waste.
4. Rapidly recognize a positive ROI by improving quality, reducing waste, and automating production - in previously labor-intensive areas.

Solution Components	SnapQC	FocalPoint	MT Series
2D & True Color Inspection	☑	☑	☑
Bottom Color Inspection	☑		☑
Automated Rejection			☑
Weight	☑		☑
Statistical Analysis and Reporting	☑	☑	☑
Nema 4X		☑	☑
Sanitary Design	☑	☑	☑

MT60 Tortilla Inspection System

Isolate and Eliminate Sources of Waste

Automated inspection provides real-time and historical information on fault, and out-of-spec conditions, allowing you to isolate the issues causing the most waste by lane, shift, product, line, and plant. The measurement results will also make it easier to reach consistent quality when developing new products or when formulation changes are made. No mechanical changes are required to measure tortillas of any size and of any color, including specialty flavors like tomato and spinach.

| Analysis Type	Example Faults	Impact on Customer or Plant	Rejection Capability	Statistical Analysis
Geometrical Analysis	Diameter too large Diameter too small	Product rejection	0-100% fully under plant control	Worst Fault Pareto
	Out of round Folds	Customer complaints		Reporting
	Rough edge Doubles	Handling problems (jamming at the counter-stacker		Dashboard
	Oval			Track values and faults by lane
Color Analysis (Top and Bottom)	Holes Toast marks to dark	Consumer Complaints	0-100% fully under plant control	Worst Fault Pareto
	Too few toast marks Under cooked area	Product rejection		Reporting
	Foreign material	Food Safety		Dashboard
		Safely reject product - plant personnel no longer reach across wide moving belt		Track values and faults by lane

Measure, Analyze, Reject

The MT Series inspection system is typically installed after the cooler to inspect tortillas for any defect, including folds that occur in the serpentine cooler. As well, the system removes tortillas that would cause jam-ups in the counter-stacker. At the same time, all measurement statistics are displayed and recorded for each individual lane, which allows operators to adjust the pressure of a specific press. Specific inputs may be used to reject tortillas in a specific lane during counter-stacker/packaging maintenance.

2-D Analysis

Maximum Diameter

Minimum Diameter
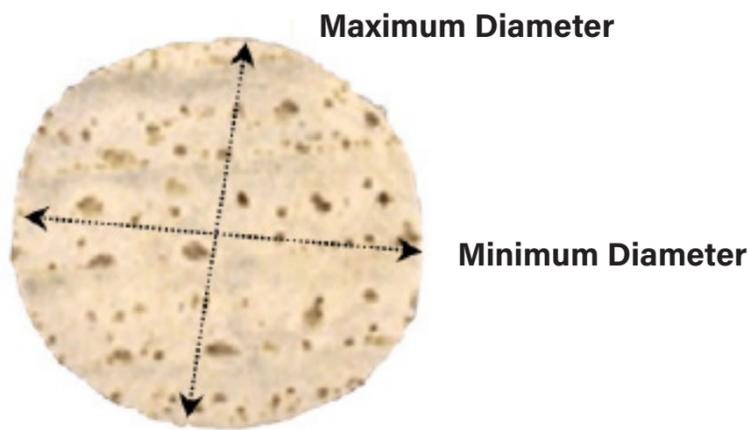
Two dimensional calculations are based on an accurately defined perimeter, which is imaged by the overhead camera.2-D measurement accuracy is ±0.5mm. Mean Diameter is another common measurement applied to tortillas.

Color Analysis

Top Average Color
(excluding toast points)

Bottom Average Color
(excluding toast points)
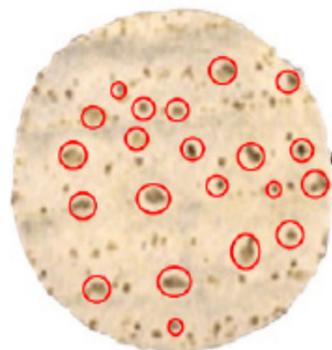
Toast Point Count
Toast Point Total Area

True color calculations, on both the top and bottom surface of the product, are measured in various units such as L*a*b* and BCU.

Fault Analysis
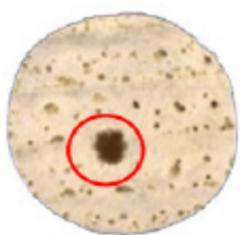
Holes/Burnt
(dark area or count)
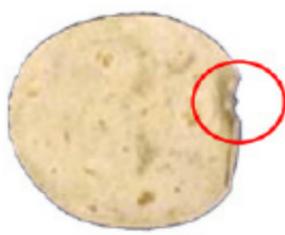
Rough Edge
(variation of radii length))
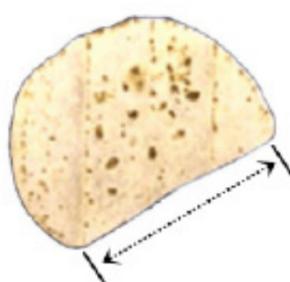
Folds
(straight edge length)

Doubles
(surface area)
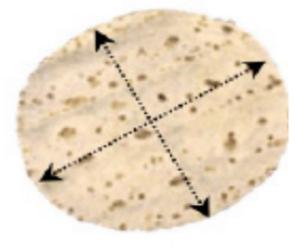
Oval
(length/width ratio)

Only common examples have been pictured. There are many standard measurements that can be used, individually orcombined within formulae, to qualify your product. **All visible product characteristics and faults can be quantified.**