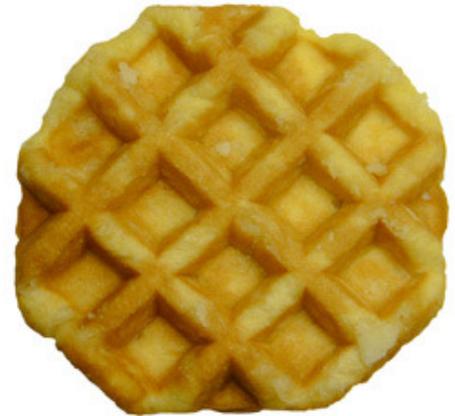


Montrose inspection and handling systems provide a complete inspection, rejection, and handling solution created just for waffle manufacturing lines. Receive comprehensive statistical analysis of variability while removing human involvement from inspection, rejection, laning and grouping.

**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. Lane and group in-spec waffles for packaging.
5. Rapidly recognize a positive ROI by improving quality, reducing waste, and automating production - in previously labor intensive areas.



Solution Components	FocalPoint	MT Series	Autolaner
Inspection	X	X	
Bottom Color Inspection		X	
Automated Rejection		X	
Lane and Group for Packaging			X
Color Imaging	X	X	
Statistical Analysis and Reporting	X	X	
NEMA 4X	X	X	X
3A Dairy Sanitary Design		X	

### > *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.

Analysis Type	Example Faults	Impact on Customer or Plant	Rejection Capability	Statistical Analysis
Geometrical Analysis	Shingled	Product rejection	0 - 100% fully under plant control	SPC Analysis On-line
	Too tall or short			Reporting
	Dents	Customer complaints		
	Doubles			Worst fault Pareto
	Shorts	Product giveaway		
	Flats			
	Tails	Handling problems, such as jamming at stacking/packaging		Track values and faults by lane/iron
Color Analysis (Top and Bottom)	Doubles	Consumer complaints	0 - 100% fully under plant control	SPC Analysis On-line
	Holes			Reporting
	Too light	Product rejection		
	Too dark			Worst fault Pareto
	Tears	Food safety		
	Oil stains			
	Too little bits	Energy at freezer		Track values and faults by lane/iron
	Raw			
Foreign material				

### > *Measure, Reject, Count, Group*

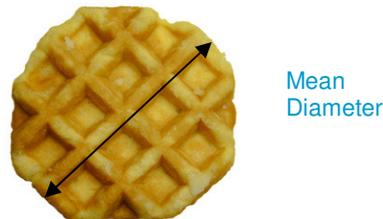
The **MT Series inspection system** is typically installed prior to the freezer to save from freezing product that will not be packaged. As well, the system removes waffles that would become frozen together and cause packaging jam-ups. Usually layouts allow for a single system to inspect waffles originating from more than one iron set and, while the iron temperature stabilizes, to reject 100% for each individual iron set.

### > *Common Height Analysis*



**Profile height calculations** are based on hundreds of individual height values gathered on every product, which leads to a measurement accuracy of  $\pm 0.5\text{mm}$ . **Mean Height** is another common measurement applied to waffles.

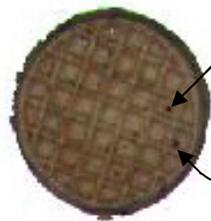
### > *Common 2-D Analysis*



**Two dimensional calculations** are based on an accurately defined perimeter, which is imaged by both overhead cameras. 2-D measurement accuracy is  $\pm 0.5\text{mm}$ . **Mean Diameter**, **Length**, **Width**, **Surface Area**, and **Volume** are other common measurements applied to waffles.

### > *Common Color Analysis*

Top Average Color  
(excluding bits)



Bottom Average Color  
(excluding bits)

Bit Count

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

### > *Common Fault Analysis*



**Holes**

(color blob analysis count, excluding pin holes)



**Shorts**

(missing area with respect to any template shape)



**Double**

(surface area; marginal color or height variation)



**Shingled**

(peak height and surface area)



**Tails**

(surface area to length/width ratio)

**Dents** (peak height), **tears** (height, holes), **flats** (height blob analysis, depressed region), **oil stains** (color), and **raw** (perimeter color) are other common waffle faults.

Only some common examples have been pictured. There are more than 100 standard measurements that can be used, individually or combined within formulae, to qualify your product. **All visible product characteristics and faults can be quantified.**