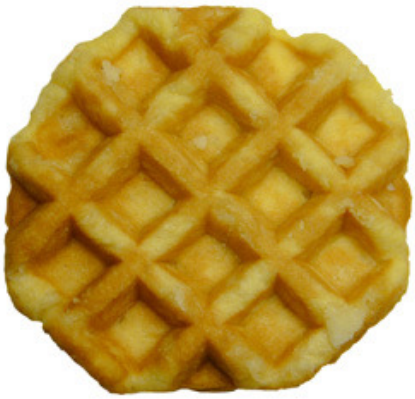
MONTROSE TECHNOLOGIES INC.

Automated Inspection & Intelligent Material Handling for Waffles

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	SnapQC	FocalPoint	MT Series	AutoLaner
3D & True Color Inspection	✓	✓	✓	
Bottom Color Inspection	✓		✓	
Automated Rejection			✓	
Laning and Group for Packaging				✓
Weight	✓			
Statistical Analysis and Reporting	✓	✓	✓	
NEMA 4X		✓	✓	✓
Sanitary Design	✓	✓	✓	✓

> *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 Too tall or short Dents Doubles Shorts Flats Tails	Product rejection Customer complaints Product giveaway Handling problems, such as jamming at stacking/packaging	0 - 100% fully under plant control	Worst fault Pareto Reporting Dashboard Track values and faults by lane/iron
Color Analysis (Top and Bottom)	Doubles Holes Too light Too dark Tears Oil stains Too little bits Raw Foreign material	Consumer complaints Product rejection Food safety Energy at freezer	0 - 100% fully under plant control	Worst fault Pareto Reporting Dashboard Track values and faults by lane/iron

> *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, during start-up reject 100% of the waffles for an individual iron that is stabilizing.

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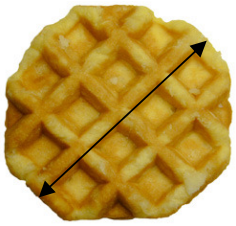
> Common Height Analysis

Profile height calculations are based on hundreds of individual height values gathered on every product, which leads to a measurement accuracy of ±0.5mm. Mean Height is another common measurement applied to waffles.

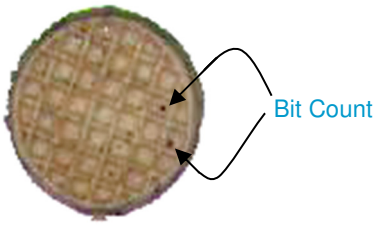
> Common 2-D Analysis



Two dimensional calculations are based on an accurately defined perimeter, which is imaged by both overhead cameras. 2-D measurement accuracy is ±0.5mm. 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)

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.

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

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