MONTROSE TECHNOLOGIES INC.

Automated Inspection & Intelligent Material Handling for Bagels

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

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. Equally feed in-spec bagels into each of the packaging lanes.
5. Automatically buffer in the case of bottlenecks.
6. 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	
De-kissing / Recirculation		X	
Laning for Entrance to Packaging			X
In-line Accumulation / Buffering		X	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 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	Too large or small Too tall or short Ovality Doubles Poor symmetry / join Hole area Hole shape	Product rejection Customer complaints Handling problems, such as jamming at the slicer / bagger	0 - 100% fully under plant control	SPC Analysis On-line Reporting Worst fault Pareto
Color Analysis (Top and Bottom)	Under- or over-baked Visible debris Too light Too dark Foreign material Too much topping Too little topping	Consumer complaints Product rejection Topping giveaway	0 - 100% fully under plant control	SPC Analysis On-line Reporting Worst fault Pareto

> *Measure, Reject, De-Kiss, Buffer, Lane*

The **MT Series inspection system** uses 3-D vision to identify kissed pairs of bagels and special mechanical features to break apart the kissed pairs. Once apart, the bagels are re-circulated through the inspection system to be inspected and graded as individual bagels. Conveyor speeds may be adjusted automatically to buffer in the case of bottlenecks downstream.

Montrose Technologies Inc. 1051 Baxter Road, Ottawa, Ontario, Canada K2C 3P2 Tel: +1-613-562-1113 info@montrose-tech.com

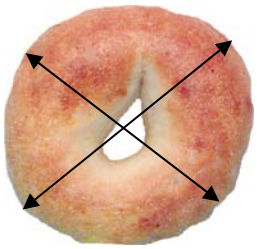
MONTROSE TECHNOLOGIES INC.

Automated Inspection & Intelligent Material Handling for Bagels

> Common Height Analysis

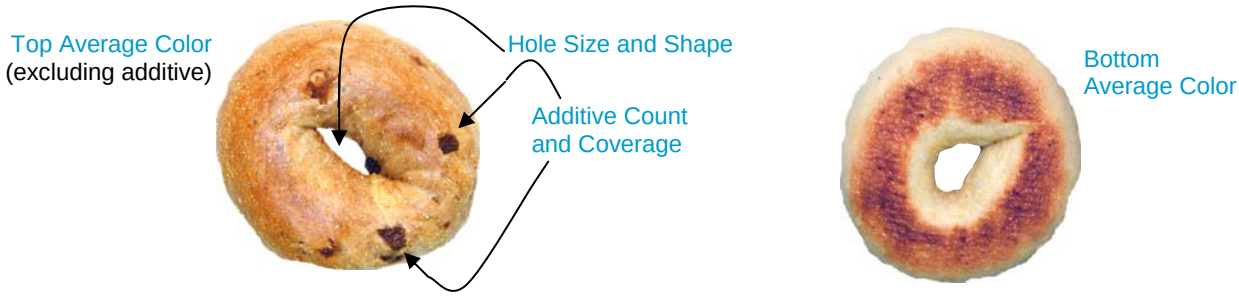
Profile height calculations are based on hundreds of individual height values gathered on every product, which leads to a measurement accuracy of ±0.5mm. Mean Height is another common measurement applied to bagels.

> 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, Roundness, Surface Area, and Volume are other common measurements applied to bagels.

> Common Color Analysis



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

Too Large
(large peak height, and/or volume)

Misshaped

Poor Join
(sloped and/or side notched)

No Hole

Kissed
(join length and double surface area, separate and re-circulate)

Double / Triple
(large surface area and hole count)

Only 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.**

Montrose Technologies Inc. 1051 Baxter Road, Ottawa, Ontario, Canada K2C 3P2 Tel: +1-613-562-1113 info@montrose-tech.com