

## See the Unseen Chemical Colour Analysis

100% online live inbound ingredient inspection and quality analysis.

bioClass<sup>®</sup> the next generation of food security & Inspection systems from Automate and Control LTD

Over the long term, the increased consumption of dates across the world, with the rising awareness about health benefits and rising demand for dates from the processing industries, is expected to drive the market growth over the study period. Fresh dates offer a variety of health benefits. They are a good source of vitamins and minerals such as calcium, iron, phosphorus, sodium, potassium, magnesium, and zinc. They also contribute fiber to the diet and have been shown to help prevent abdominal cancer. Hence, the increased awareness over the health benefits of date consumption has boosted their imports worldwide. However, some factors such as stringent regulations, risk of pests and diseases, and political uncertainties in the Middle Eastern region are expected to restrain the market growth during the forecast period.

To aid with compliance to these quality control constraints Automate and Control LTD provides application-specific hyperspectral imaging (HSI) systems designed to be integrated into existing processing facilities. These systems can be used for sorting and quality inspection of fruit with characteristics that may not be detectable by the human eye or may not be measurable by conventional machine vision cameras.

Solutions can be implemented for applications such as the detection or measurement of:

- Foreign objects detection and removal
- Moisture content in fruit
- Pathogen detection
- Extreme accuracy colour sorting
- Unwanted adulteration substances
- Measure sugar content (BRIX)
- Loose Skins

The global date palm market size is predicted to reach **over USD 21.5 billion by 2029**. The target market is projected to be driven by rising demand for healthy ingredients and rising demand for cookies, healthy snacks, desserts, and bakeries.

Forecast Period: 2021-2028

Growth Rate: CAGR of 5.4% during 2021-2028

Forecast Unit: Value (USD)

Automated hyperspectral detection and classification of foreign debris benefit from the very latest and fastest artificial intelligence (AI) and machine-learning algorithms.

Classification schemes for a wide variety of tasks can be developed by "training" systems that are installed on the production line or installed in adjacent laboratory space. Once a "classifier" has been developed, it can be uploaded into our system to be run on the line. If a better classifier is discovered later, it can easily replace the older one.

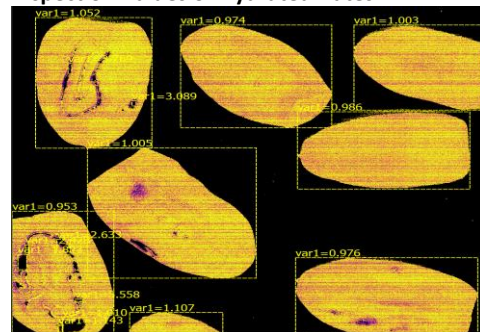
Unlike conventional grayscale or RGB color cameras, Automate and Control's hyperspectral systems capture a wide range of the visible to near-infrared spectrum in extraordinary spectral and spatial resolution. Multispectral sensors are limited to a small selection of wavelengths, and most need their hardware and optics to be reconfigured when different wavelengths are required. With high end hyperspectral sensors our systems benefit from in-house holographic grating fabrication and spectrograph designs that optimize performance of the "spectral engine" to the job at hand capturing hundreds of wavelengths with narrow bandpasses.



**Good Hydrated Dates**



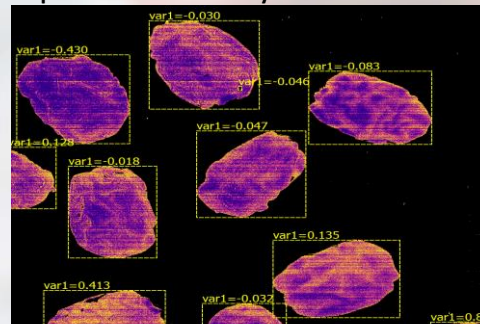
**Inspection Values of Hydrated Dates**



**Reject Dehydrated Dates**



**Inspection Values of Dehydrated Dates**







## WHEN ONLY QUALITY MATTERS

### 3<sup>rd</sup> Generation Hyperspectral Quality Inspection Systems

#### bioClass®

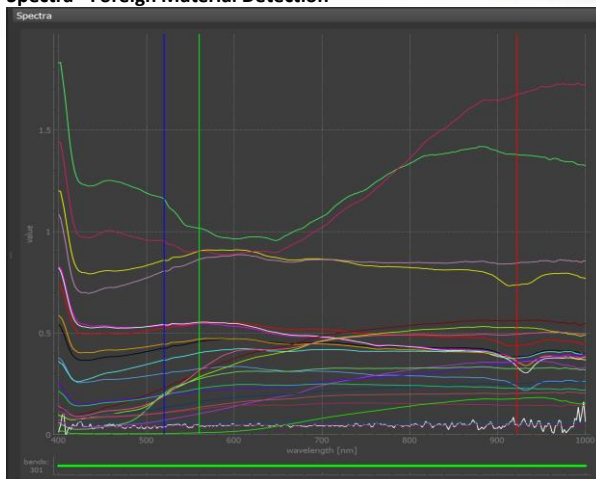
#### BRIX

Sweetness, or the concentration of soluble solids is of particular importance. Commonly reported in degrees Brix, it is a key quality factor in assessing the grade of the product delivered into the processing facility. Results are used to calculate the value of the delivered fruit and are directly tied to costs and profitability. The measurement traditionally requires obtaining a representative sample from the delivered load and then juicing and analysis using a laboratory refractometer. However, the process of obtaining results can be slow and labor intensive.

Hyperspectral Imaging (HSI) offers a solution to this challenge. An HSI system can rapidly collect highly resolved spectral data from produce passing under the sensor. Processing this data in real time and applying statistical analysis algorithms developed by Headwall, the system delivers to the user a predicted °Brix value at the end of the scan.

Field boxes or entire truck loads can be scanned in minutes and the results sent to production control stations. Real-time results help speed up receiving operations, optimize decision making and deliver significant ROI.

#### Spectra - Foreign Material Detection



Classes	
0	Unknown
1	Background
2	Plastic 1
3	Plastic 2
4	Plastic 3
5	Plastic 4
6	Plastic 5
7	Plastic 6
8	Plastic 7
9	Plastic 8
10	Dry Date
11	MOLD STALK
12	Stalk
13	Wood
14	Cig Paper
15	CIG Butt
16	METAL 1
17	METAL 2
18	METAL 3
19	METAL 4
20	GOOD DATE HYDRATED
21	STRING
22	Black String
23	Rock 1
24	Rock 2



STONE



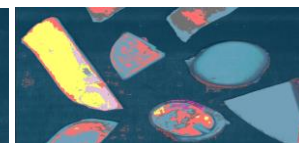
STRING - PLASTIC



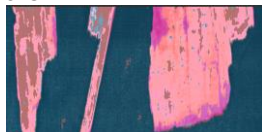
WASTE CIGARETTES



METALS



PLASTICS



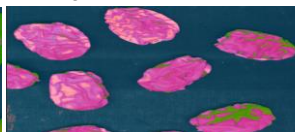
WOOD



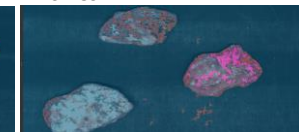
MOLD - ROOTS - STALKS



GOOD DATES



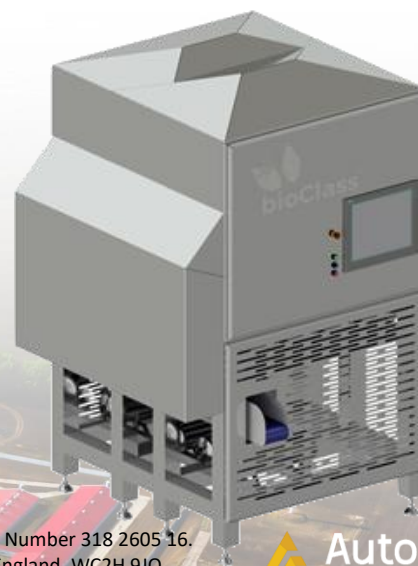
DRY DATES



MORE STONE

High speed dual & single sided system (PRODUCE SPECIFIC)  
Servo or pneumatic driven multi lane reject system.  
Automatic infeed product spacing system integrated with infeed conveyor.  
Latest technology non-contact AI driven hyperspectral inspection technology.  
Color touch screen Industrial PC & HMI.  
Cellular remote access (Optional)  
Realtime PLC Control.  
Operating environment 0 to 40°C 32 to 104°F - 35 to 85%RH.  
Environmentally controlled enclosures can be quoted for on application.  
IP65 304 Stainless Steel / Hard Anodized Aluminum Structure  
Ultra Hygienic Eazi Clean Zero Tool Strip Down for cleaning.  
Optional Air Free System  
CE certified.  
Built in the UK.  
FDA food contact parts.  
All contact parts 316 Stainless Steel

## bioClass® for FRUIT



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**Automate**  
& CONTROL