clearview

case studies

Pharmaceutical | Granule Inspection

The pharmaceutical and food industries require fast and highly-accurate inspection systems for detecting and separating foreign materials from the large batches of raw materials that they process. By working closely with Clearview, JPS Imaging Limited has developed a high-precision inspection system that uses machine vision to perform outer-appearance inspection of granules and powders. These bulk materials are generally encapsulated, made into tablets, or packaged into sachets by pharmaceutical companies. The system is also used by food manufacturers to inspect raw materials, like flour or sugar, prior to mixing and processing.

High accuracy inspection

The granules are continuously fed into a hopper and distributed in a uniform thin layer onto two vibrating conveyor feeders. Each conveyor has a set of six Teledyne FLIR Flea3 1.3 MP GigE Vision cameras continuously inspecting the granules for defects. The cameras are controlled by three Matrox 4Sight industrial computers each equipped with a Matrox Solios capture card. Each 4Sight system has four cameras connected and are able to simultaneously capture and analyse each image in real time (i.e., within the frame rate of the cameras at 30 frames/second).

Robert Jones Managing Director at JPS Imaging explains, "The Matrox products were selected because of the high performance offered by the 4Sight and Solios configuration." Simultaneous, real time capture and analysis is performed on images of 1280 x 960 pixels and typical defect sizes are 0.25mm x 0.25mm.

The images are processed using the Matrox Imaging Library (MIL) image processing, measurement and blob analysis modules. The inspection system can detect fibres and hairs down to 0.1mm by 2mm long, black particles (e.g. insect parts, and plastics and solids) down to 0.2mm by 0.2mm, and bright or dark metallics down to 0.3mm by 0.3mm. High intensity OPT LED bar illuminators provide even illumination across the width of the vibratory conveyor feeder. Any defects that are detected are automatically ejected via a slider mechanism.

Operator interface and reporting

The vision system is linked to a master PC system via a local network. The master PC controls user input, live image, fault image, and system set-ups. Images of defects are automatically stored onto a master PC via network to each vision system. These images can be uploaded onto the factory network and can be viewed by the quality and other departments as required. The intuitive user interface is via touch screen and can be used to monitor and control production data and inspection conditions. Plant personnel can also access information such as inspection and error reports using this interface.

No rejected batches

The feeder provides a continuous supply of material and multiple lines allow for extremely high processing throughput. The JPS granule inspection system processes material at the rate of 100 kg per hour for powders/granules with a density similar to that of granulated sugar. The system has an efficiency of greater than 99% so false reject material is negligible. Robert Jones explains, "Our inspection system provides pharmaceutical and food manufacturers with complete control over their production processes. The system also lets them identify and prevent problems that, if left uncorrected, could ultimately lead to rejected batches, which are very expensive in terms of lost production time and wasted materials."