

Fruit Inspection: Defect Detection and Sizing

Fruit must be inspected for defects and correct sizing before purchase. Defects include bruising, discoloration, cracks, cuts, and other aesthetic damage. Previous method required the buyer to visually inspect a sample of the fruit by hand. This process was very laborious and time consuming, taking approximately 2 hours per 50 pound inspection.

Solution:

A presort system was developed to inspect a sample of the fruit quickly, efficiently, and at a high level of accuracy. The system consists of a hopper, conveyor belt, 4 GigE cameras, 3 light sources, an industrial embedded computer, and monitor.

The sample is dumped into the fruit hopper, one by one the fruit moves down the conveyor belt and drops through to a bin. Before reaching the bin, 4 GigE cameras capture 360 degree images of the fruit. The images are processed by an industrial embedded computer, which recognizes any defects and compares the fruits' sizing to the acceptable size range. The system counts the total number of fruit, the number of passed fruit, the number of rejected fruit and displays the information on a monitor.

The inspection process is reduced from 2 hours per 50 pounds of fruit to minutes. The inspector can now inspect batches of fruit in a greatly reduced amount of time. This allows not only for an easier inspection, but significantly more inspections in a given time frame. An additional benefit of the system is that the person conducting the inspection does not require the experience or expertise of visual hand inspection – the system is standardized to the inspector's set specifications to perform the inspection consistently and reliably.

