

APPLICATION EXAMPLE

Apex 3-CMOS R-G-B color area scan cameras for food inspection

Color vision systems play a vital role in the food industry, not only to safeguard consumer health but also to ensure consistent product appearance that supports retail brand value. JAI's Apex 3-CMOS R-G-B cameras provide precise, high-quality color information, and are ideal for a wide range of automated inspection applications in food processing — helping manufacturers maintain both safety and cosmetic standards.

High-precision color grading

The Apex cameras use advanced prism technology to sharply separate red, green and blue light to individual sensors, delivering clean, accurate colors with minimal crosstalk—even under mixed lighting conditions (unlike conventional Bayer cameras). This enables more precise grading and the reliable detection of subtle color variations in fruits and vegetables. Such accuracy helps determine ripeness stages, from “under ripe”, “just ripe” to “overripe.” When integrated with multi-spectral illumination, the Apex cameras can achieve even more precise color detection by sequentially triggering LED lights with narrow spectral ranges. This setup can create six or even nine distinct color channels, significantly enhancing the ability to capture fine visual details.

Defect detection

Apex R-G-B cameras are highly effective for identifying subtle discolorations on fruit and vegetable surfaces that may signal defects — such as green skin on potatoes. These slight color changes can also reveal early rot, frost damage, or even pesticide residues. In addition, the cameras' high spatial precision enables the detection of micro flaws, for example tiny cracks in eggshells, that would otherwise go unnoticed.

Cosmetic uniformity and brand consistency

Sorting fruits, eggs, baked goods, and other food items by consistent color shades is essential for ensuring cosmetic uniformity and supporting brand consistency.

The Apex Series Cameras

Powered by 3-CMOS prism technology, Apex cameras deliver far greater color fidelity and spatial precision than conventional Bayer mosaic-based color cameras. With resolutions of up to 5.1 megapixels, they are suited for sorting and grading applications in food processing inspection systems.



AP-5100T models:

- 3 x 5.1 megapixels. (2472 x 2064 pixels).
- 3 x IMX548 Pregius S (backside illuminated).
- Up to 75 FPS full resolution.
- 2.74 μm x 2.74 μm pixels.
- CoaXPress v2.0, 5GiE Vision and Camera Link.

AP-3200T models:

- 3 x 3.2 megapixels. (2064 x 1544 pixels).
- 3 x IMX265 and 3 x IMX252 Pregius.
- Up to 106 FPS in full resolution.
- 3.45 μm x 3.45 μm pixels.
- 10GiE Vision, USB3 Vision and Camera Link.

AP-1600T models:

- 3 x 1.6 megapixels. (1456 x 1088 pixels).
- 3 x IMX273 Pregius.
- Up to 126 FPS in full resolution.
- 3.45 μm x 3.45 μm pixels.
- Interfaces: GiE vision, USB3 Vision and Camera Link.

More information:

For more information on the Apex 3-CMOS prism-based camera models please visit:

<https://www.jai.com/products/product-lines/apex-series-3-sensor-area-scan>

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