



SUNCUP Juice Cup X-Ray Performance Analysis Report

Test Overview

This report summarizes the performance testing conducted on SUNCUP Apple Juice Cups and a comparable juice cup product using our X-ray inspection system. The purpose of the testing was to evaluate the detection sensitivity of different contaminant materials commonly used during X-ray performance validation.

The products were scanned under controlled testing conditions using calibrated SUS304 stainless steel, ceramic, and glass balls of varying sizes. The test determines the minimum detectable contaminant size for each material.

Test Sample 1 – SUNCUP Apple Juice Cups

Product Tested

- SUNCUP Apple Juice Cups

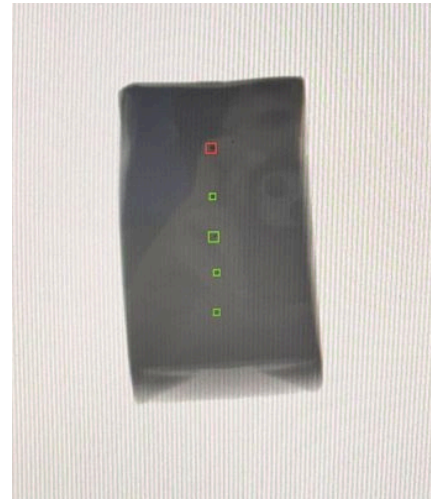
Test Method

The product was passed through the X-ray scanner multiple times using different contaminant samples embedded within the juice cups. The system sensitivity was adjusted to achieve the best possible detection performance while maintaining stable inspection operation.

Testing Results

Contaminant Type	Best Detected Size
SUS304 Stainless Steel Ball	1.5 mm
Ceramic Ball	1.0 mm
Glass Ball	Not detected up to 5.0 mm





Performance Analysis

The X-ray system demonstrated reliable detection performance for both SUS304 stainless steel and ceramic contaminants within the SUNCUP juice product.

- The system successfully detected SUS304 stainless steel balls down to 1.5 mm.
- Ceramic contaminants were detected down to 1.0 mm, showing strong sensitivity for high-density non-metallic materials.
- Glass contaminants were not detected up to 5.0 mm due to the low density contrast between the glass material and the liquid product composition.

The test results indicate that product composition, liquid density, and packaging structure can significantly influence glass detection capability in liquid-filled containers.

Test Sample 2 – Similar Juice Cup Product

Product Tested

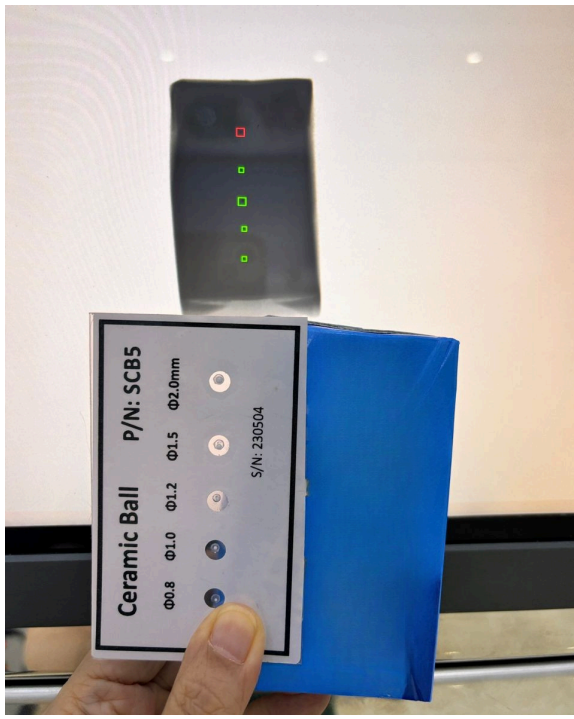
Comparable Juice Cup Product

Test Method

A second juice cup product with similar packaging and liquid characteristics was tested using the same X-ray inspection parameters and contaminant materials.

Testing Results

Contaminant Type	Best Detected Size
SUS304 Stainless Steel Ball	0.6 mm
Ceramic Ball	0.8 mm
Glass Ball	4.0 mm



Performance Analysis

The second juice cup product showed improved detection sensitivity compared to the SUNCUP sample.

- SUS304 stainless steel contaminants were detected down to 0.6 mm.
- Ceramic contaminants were detected down to 0.8 mm.
- Glass contaminants were detectable at 4.0 mm.

The improved performance may be influenced by differences in product density, ingredient composition, packaging material thickness, or fill consistency. These factors can affect X-ray penetration and contaminant contrast during inspection.

Conclusion

The testing confirms that the X-ray inspection system provides effective contaminant detection performance for juice cup applications, particularly for metallic and ceramic foreign objects.

Detection sensitivity can vary depending on the product formulation and packaging characteristics. Glass detection in liquid-filled products remains more challenging due to lower contrast levels between the contaminant and the surrounding product.

Additional optimization of X-ray settings and conveyor stability may further improve inspection performance depending on the specific application requirements.