

# Application Brief: E3Z-B Sensor PET Bottle Detection

## INDUSTRY

Food and Beverage

## APPLICATIONS

Bottle De-scrambling, Washing, Filling, Capping, Labeling, Marking and Packing

## PROBLEM

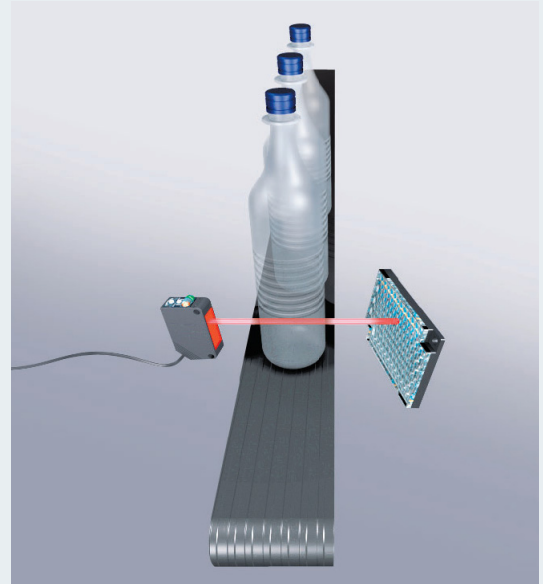
PET or PETE transparent plastic bottles, like all clear materials, are difficult to detect in a reliable and repeatable manner using conventional photoelectric sensors. Missed product, miscounts, jams, mislabeling or marking, inconsistent packaging and wasted product substantially effect your bottom line.

## OMRON ADVANTAGE

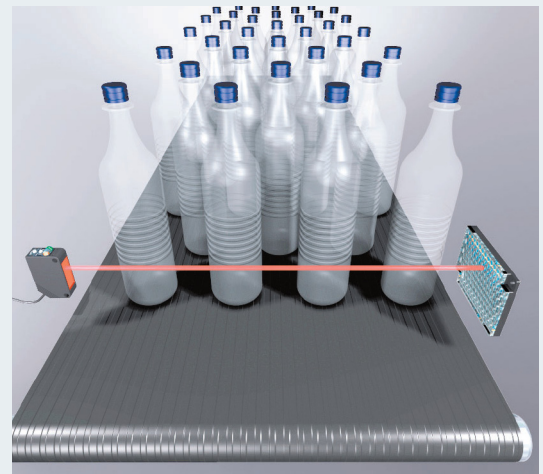
### E3Z-B Transparent PET Bottle Sensor

The industry's first and only sensor specifically designed for accurate and reliable detection of PET bottles. Pick up leading edges repeatably for labeling and marking, eliminate miscounts, reduce waste, reduce downtime and increase quality. Detect single bottles or stacked bottles.

## APPLICATION DIAGRAMS



Short range model for detecting single bottles



Long range model for detecting multiple "stacked" bottles or across accumulators

## PET Bottle Detection Application Details

### ISSUE

PET or PETE (Polyethylene Teraphthalate) bottles and containers pose significant challenge to packaging operations. Because the PET bottles are very transparent and often contain complex geometries, the standard polarized retro-reflective sensors, commonly utilized for detecting clear materials, have proven to be unreliable – leading to increased machine downtime, defective packaging, product miscounts and waste.

### CAUSE

Polarized retro-reflective sensors detect clear materials by using horizontal and vertical polarizing filters to emit and receive the light from the sensor on specific planes. A special “corner cube” reflector returns emitted light to the sensor after phase-shifting the light by 90 degrees. When a clear object is present, a minute amount of the light is scattered or absorbed.

The sensor’s electronics then compare the amount of emitted light with the received light and identify when a small change has occurred to trigger the output that an object is present. Because such little light energy is lost passing through clear material, special electronics are required to ensure that the hysteresis (switch-on/switch-off point) of the sensor is accurate enough to reliably detect the clear material. This type of sensor works well for most types of clear materials.

However, because the refractive characteristics of the PET material can phase shift much of the light in the same way that the corner cube reflector does, the sensor can be fooled into thinking that no bottle is present, resulting in unreliable detection of this material.

### OMRON'S UNIQUE SOLUTION

Omron’s new E3Z-B PET bottle sensor abandons the polarizing approach and utilizes unique optics called “Inner View Optics” to better focus and intensify the emitted light in a precise pattern – eliminating the influences of extra light energy that can cause unreliable detection. The custom optics work in combination with sophisticated electronics to reliably detect PET materials. The new sensors also feature EMI/RFI immunity, special fog resistant reflector, have added shock resistance and are IP67 rated for washdown protection to 1200 psi.

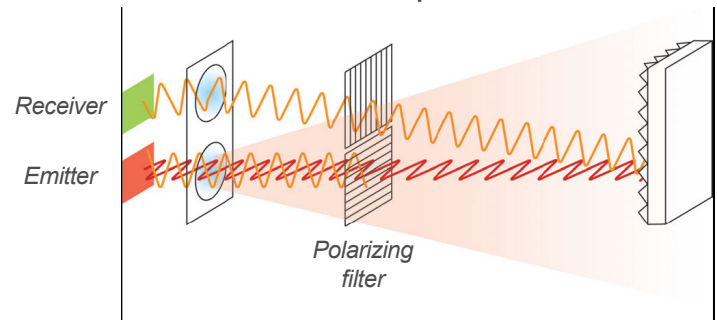
### RESULTS

The result is a highly accurate and reliable detection methodology for PET bottle applications that reduces product waste, machine downtime and defective packaging and mislabeling of product. The sensor provide 99.9% reliability in detection of PET bottles and increases your profitability by keeping your production lines running and lowering product and container waste.

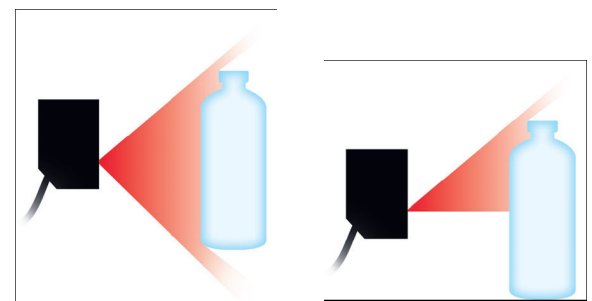
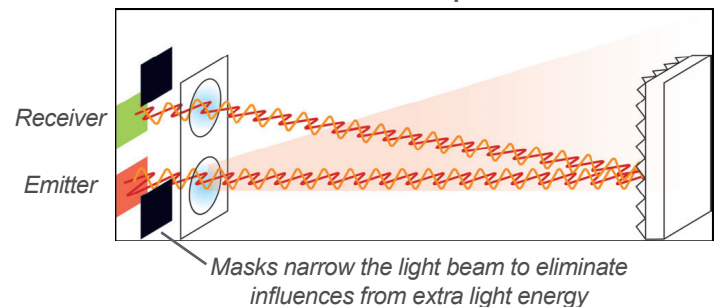


Complex geometry      Highly transparent

#### Standard Polarized Retro-reflective Sensor Operation



#### E3Z-B Sensor Operation



Standard Retro-reflective Light Pattern

E3Z-B Light Pattern