



# BBULL Fill Level Inspection

Measuring Systems for the most  
demanding Applications

# PRODUCT SPECIFICATIONS

## General Introduction

Reliable and precise inspection of levels in filled and sealed containers is one of the most important tasks of a quality management system in the bottling industry. This requirement is supported not only by statutory regulations, but also by quality security and the efficiency of the bottling process. The use of our underfill inspection system avoids underfilled containers.

Our overfill inspection system ensures that overfilled containers are identified before bursting. At the same time excessive quantities can be detected preventing an expensive product waste.

The **BBULL** fill level inspection systems from **BBULL TECHNOLOGY** guarantee accurate measurements using the whole variety of technologies for various applications.

The compactly designed **BBULL** systems are characterized by high functionality and accuracy combined with reliable engineering based on the latest safety regulations.

To minimize installation and maintenance efforts the sensor bridges are designed to enable the integration of the closure and the label inspection systems directly into the bridges.

## X-Ray Fill Level Inspection

By introducing the X-ray technology to the packaging industry **BBULL** set new standards for fill level inspection systems.

Using X-ray sources means on the one hand to benefit from the radioactive sources' advantages (compared to former methods) and on the other hand to eliminate most of the radioactive sources' problems.

Use of conventional gamma level inspection requires compliance with strict statutory regulations, particularly concerning disposal, use and storage of the radioactive sources.

Although high frequency systems do not generate radioactive radiation these systems entail considerable disadvantages respecting the measuring accuracy for example, when used for products with a tendency to foam or at very high production rates with a lot of different containers.

**BBULL's** **BBULL** X-ray fill level inspection device operates without radioactivity and guarantees best reliability and accuracy even at highest production speeds and when numerous bottles shapes and sizes are inspected.

The outstanding advantage of this system is the fact that there is only radiation during operation. So there are no problems with transport, disposal, licensing or necessary markings (such as radiolabelling...).

## Application

- glass, PET, cans
- every kind of liquids and substances with low moisture content
- underfill inspection
- overfill inspection (with a separate sensor bridge)
- measuring accuracy: 1-3 mm depending on the environmental conditions
- installation at the conveyor after the bottler, the closure unit or the labeller
- max. capacity: 120.000 containers per hour

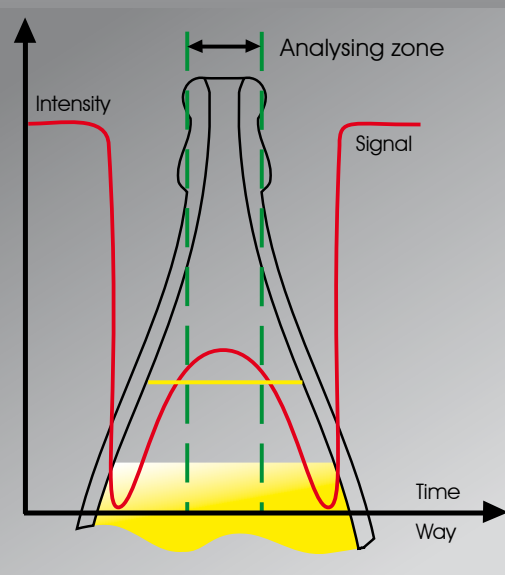
## Gamma Fill Level Inspection



Radioactive isotopic solid sources (AM 241) are well tried means for checking filling levels. The superior advantage of this technology is the capability to use it for all types of containers and products. The basic principle (measurement of density, detection of different gamma absorption rates) permits maximum precision even in the most challenging applications known in the packaging industry.

## Application

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BBULL CL-O

# Optical Fill Level Inspection

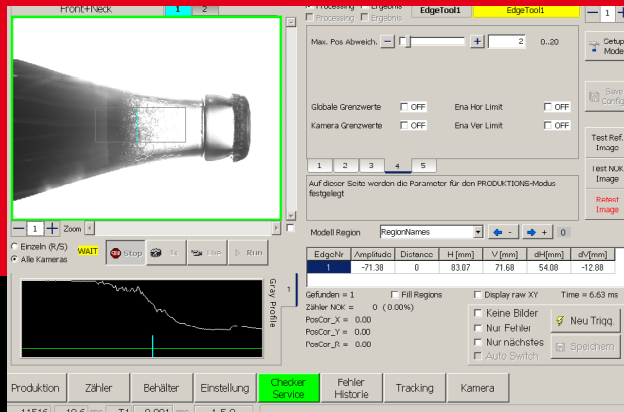
Systems based on light technologies can be used for a considerable variety of containers as another radiationless alternative. One of the most outstanding features of the **BBULL** systems is the use of optical light reflection by water molecules.

The sender's emitted light is only reflected by these water molecules. The energy loss from sender to receiver is a reliable measure for the actual fill level. As the chosen wavelength penetrates paper, plastic and glass, also non-transparent containers can be inspected. Due to the restriction that no metal is allowed inside the measurement range, cans and bottles with metallic foils can't be inspected.

Consequently **BBULL TECHNOLOGY** systems based on laser technology are qualified for applications that can't be performed by camera systems. The measurable container variety and the fact of low sensitivity against surroundings are the most important advantages of the laser inspection over the HF technology. It is an excellent alternative especially for applications in the food industry as there is generally no radiation.

## Application

- glass, PET (transparent, non-transparent)
- liquids with high water portion
- large variety of containers (with different bottle sizes)
- underfill inspection
- overfill inspection
- measuring accuracy: 2-5 mm depending on the environmental conditions
- installation at the conveyor after the filler (less foam), the closure unit or the labeller (no metallic foil)
- max. capacity: 72.000 bottles per hour



# CCD Fill Level Inspection

A **BBULL TECHNOLOGY** image processing system can be used for final inspection of transparent filled bottles (fill level/closure). This optical inspection system completes the existing range of products with an entire inspection station.

A CCD Camera sensor generates bottle pictures sidewise and its backlight provides a container picture via transmitted light. So the fill level is calculated analog by software.

As far as the quality of the closures (position, screw, colour, safety ring) is concerned further inspection options make an analysis of the taken pictures possible. Additionally the system can be expanded to a filler or closure monitoring system easily by a software upgrade.

## Application

- glass, PET (transparent only)
- underfill and overfill inspection with one sensor bridge only
- option: filler-/closure monitoring
- option: cap inspection (presence, colour, position, tilted cap)
- option: safety ring inspection (disruption, "smilies")
- accuracy 1-3 mm, depending on environmental conditions
- installation at the conveyor after filler, closure unit or labeller
- max. capacity: 72.000 bottles per hour



# Comparison of Measurement Methods



	X- ray	Gamma	optical	CCD
Underfill inspection	X	X	X	X
Overfill inspection	Sep. sensor bridge	Sep. sensor bridge	Sep. sensor bridge	X
Measuring accuracy	1- 3 mm	1- 3 mm	2- 3 mm	1- 3 mm
Max. production capacity (c/h)	120.000	120.000	72.000	72.000
Official regulation	Radiation officer	Radiation officer Fire officer, Certified protection against leaks	not applicable	not applicable
Operating permit	Mandatory registration	Licensed by Factory Inspectorate	not applicable	not applicable
Obligatory markings	Radiation warning lamp		not applicable	not applicable
Transport registration	not applicable	yes	not applicable	not applicable
Container types	Glass, PET, Cans	Glass, PET, Cans	Glass and PET	Glass and PET transparent
Diversity of container	no effect	no effect	no effect	no effect
Foaming products	no effect	no effect	limited measuring accuracy	limited measuring accuracy
Tin foil lining	no effect	no effect	not possible	not possible
Hot filling	no effect	no effect	no effect	no effect

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