INDUSTRY // FOOD & BEVERAGE

Food and beverage vision inspection for filling and packing lines in South Africa

Camera checks on bottling lines and packing lines: filling, capping, labelling, coding and case packing.

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Request an assessment

// SHORT ANSWER

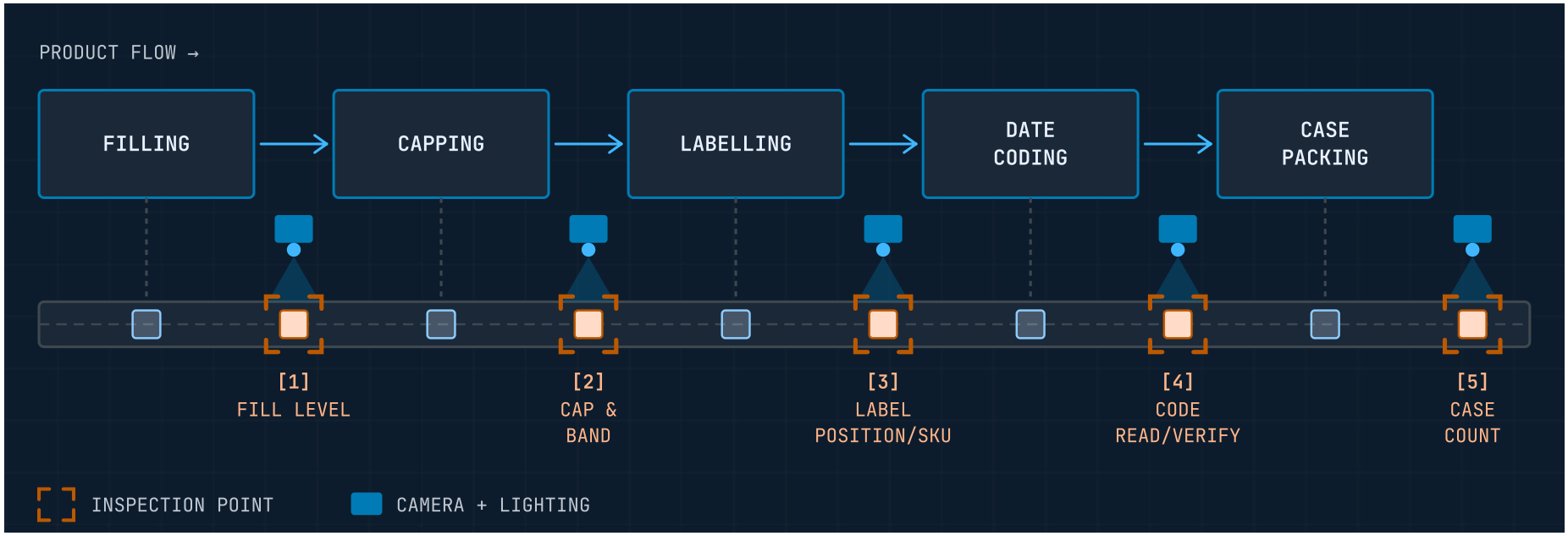
Food and beverage vision inspection places camera checks along the bottling or packing line: after the filler for fill level, after the capper for caps and tamper bands, after the labeller for label position and SKU, after the coder for date and batch codes, and at the case packer for counts. Washdown, condensation, foam and frequent changeovers decide how the station is built. Vision does not replace food safety testing, leak testing or checkweighing.

// WHERE IT FITS

Inspection points on a bottling line and packing line

A typical sequence for bottles and jars; your line may add or skip steps. Each check sits after the step that can cause the fault.

[Schematic] PROCESS FLOW · NOT TO SCALE



[1] Fill level: after the filler, seen through the container.

[2] Cap & band: missing, high or tilted caps; missing tamper bands.

[3] Label: presence, position and the right SKU.

[4] Code: date and batch code present, readable and correct.

[5] Case count: every position filled before the case closes.

// DEFECT RISKS

What goes wrong at each step

Visible faults by step, and the application that checks for them.

PRODUCTION STEP	TYPICAL VISIBLE FAULTS	INSPECTION
Filling	Under-fill or over-fill; foam at the neck	Fill level, cap & seal
Capping	Missing, high or tilted caps; missing or broken tamper bands	Fill level, cap & seal
Labelling	Missing, crooked or flagging labels; the wrong label after a changeover	Label & print inspection
Date coding	Missing, faint or smudged codes; the wrong date or batch	OCR/OCV & date codes
Case packing	Empty positions in a case, tray or multipack	Presence, absence & counting

// INSPECTIONS

Checks that apply on food and beverage lines

Together they cover most beverage inspection and food packaging inspection on the line. Several can share one station when the features are visible from one position. A food inspection machine that examines the product itself, such as X-ray or metal detection, is a different category.

Fill level, cap & seal

Fill level through PET or glass, cap presence and tilt, tamper bands. Not a leak test.

Label & print inspection

Label presence, position and SKU, including after flavour or pack-size changes.

OCR/OCV & date codes

Best-before dates and batch codes checked against the running product.

Presence & counting

Every position in a case, tray or multipack filled before it is closed.

At: filler and capper

Fill level, cap & seal →

At: labeller

Label & print inspection →

At: coder

OCR/OCV & date codes →

At: case packer

Presence & counting →

// APPLICATION MAP

Food and beverage inspection scenarios by product

Common products on South African food and beverage lines, what a camera checks on each, and the application page with the detail. The method in each row is a starting point, confirmed on your own samples. Weight, seal tightness and foreign bodies inside a closed pack need a checkweigher, leak tester, metal detector or X-ray.

PRODUCT / LINE POSITION	WHAT IS INSPECTED	TYPICAL FAULT CAUGHT	INSPECTION METHOD	RELATED APPLICATION
PET water bottles after the filler and capper	Fill level through the clear wall; cap height and tilt	Low or high fill; missing, high or cocked cap	Backlight behind the bottle; side camera at the neck	**Fill level, cap & seal**
Returnable glass beer bottles empty, after the bottle washer	Base, sidewall and finish of the empty bottle	Chipped finish, residue or a foreign object in the base, the wrong bottle shape	Base camera lit from below; finish camera looking down with a ring light	**Empty containers & preforms**
Canned soft drinks after the seamer and coder	Date and batch code on the can end or base	Missing, smudged or wrong code. The fill inside a can is not visible to a camera	Camera over the can end with dome light to calm the shiny metal; OCR/OCV	**OCR/OCV & code inspection**

PRODUCT / LINE POSITION	WHAT IS INSPECTED	TYPICAL FAULT CAUGHT	INSPECTION METHOD	RELATED APPLICATION
Fresh milk bottles after the capper	Cap colour against the product being filled	The wrong-colour cap after a changeover between milk types	Colour camera above the cap with diffuse light	**Fill level, cap & seal**
Fruit juice cartons after the carton filler	Screw cap on the carton top	Missing or crooked cap	Camera looking down on the carton top, diffuse light	**Presence & counting**
Yoghurt pots with foil lids after the cup filler and sealer	Foil lid present and centred; the sealing flange; lid print	Missing or off-centre lid, product on the flange. Not a leak test	Dome light over the cups to calm foil glare	**Fill level, cap & seal**
Crisps (chips) and snack pouches at the form-fill-seal bagger exit	Top seal area and the printed best-before code	Product trapped in the seal, creased seal, missing code	Camera at the jaw exit with light across the seal; OCR for the code	**Fill level, cap & seal**
Sliced bread bags after the bag closer	Closure clip or tag present and its printed day code	Missing clip, the wrong day on the clip	Camera at the closer with diffuse light; OCV on the clip	**OCR/OCV & code inspection**

PRODUCT / LINE POSITION	WHAT IS INSPECTED	TYPICAL FAULT CAUGHT	INSPECTION METHOD	RELATED APPLICATION
Rolls and buns in bakery trays before trays are stacked	Every tray position filled	Empty or doubled positions, product on the tray rim	Overhead camera with even diffuse light	**Presence & counting**
Sauce and condiment sachets after the multi-lane sachet machine	Seal ends and print on every lane	Product in the seal, open end, misregistered print	One view across all lanes, with backlight or low-angle light	**Label & print inspection**
Wine bottles after the labeller	Front and back labels, neck capsule	Crooked or flagging label, the wrong back label for the vintage, missing capsule	Several cameras around the bottle, diffuse light	**Label & print inspection**
Ready-meal trays with printed sleeves after sleeving	Sleeve matches the meal in the tray	The wrong sleeve on a tray after a changeover	Barcode read on the sleeve plus an artwork check	**OCR/OCV & code inspection**
Shrink-wrapped multipacks before the shrink tunnel	Bottle or can count in each pack	A missing unit in the pack	Overhead camera before the film goes on; opaque film hides units	**Presence & counting**

PRODUCT / LINE POSITION	WHAT IS INSPECTED	TYPICAL FAULT CAUGHT	INSPECTION METHOD	RELATED APPLICATION
Shipping cases and pallets at the case sealer and stretch wrapper	Case and pallet labels present, readable and matching the product	Missing, unreadable or wrong label	Fixed code reader or camera beside the conveyor	**Carton & pallet verification**

// SOUTH AFRICA

South African food rules that inspection supports

R146, R638, legal metrology, FSSC 22000 and GS1: what they require on the pack, and which parts a camera can check.

South African food rules set what must be on the pack and in what condition; none of them prescribes camera inspection. Vision is one way to check, on every unit, the visible parts of what the rules require. The main rules a food or beverage plant works to:

- **R146 (labelling, 2010):** a batch number on every container (regulation 11); a clearly indicated date with “best before”, “use by” or “sell by”, numeric dates in day-month-year order (regulation 12); label information clearly visible, legible and indelible (regulation 7); common allergens declared (regulation 43). Label, date code and batch code checks cover the visible side of these.

- **R638 (hygiene, 2018):** contamination includes foreign matter; prepacked food must be sealed so it cannot be removed without the seal being broken; records are kept for at least six months after shelf life, with a traceability system and a recall procedure. Cap, tamper band and seal checks, and results stored per batch, support these.
- **Legal metrology:** quantities within the SANS 458 tolerances, and a duty for users of automatic fillers outside the “e” mark scheme to detect incorrect quantities and keep check records. Fill level checks catch under-filled containers; weighing proves quantity.
- **FSSC 22000 version 6:** products labelled to the law of the country of sale, including allergens (2.5.2(a)); quantity control (2.5.9(b)); changeover controls that remove the previous run’s labels and packaging (2.5.9(c)).
- **GS1 South Africa:** many retailers require its barcode test report, to ISO/IEC 15416, when a product is listed.
- **BRCGS guidance (Issue 8 FAQ, clause 6.2.4):** online label and code verification equipment should be challenged with incorrect packs, including the reject and the no-read alarm.

Wrong-pack and allergen incidents on shared lines

The National Consumer Commission’s published recall notices include a case where a food product was packed into the

packaging of a different variant, so its allergens were not declared. Lines that run several flavours or recipes in similar packaging carry exactly this risk at every changeover. A label check that reads the pack's barcode or artwork and compares it with the product being run stops the first wrong pack; it cannot tell whether the product inside matches a correct pack.

Cans: dents and damaged ends, and what a camera cannot see

R638 prohibits selling canned food in a container that is blown, badly dented or damaged, leaking or unsealed. The NRCS lists seam defects, leaking cans and cans with pinholes among the non-conformances it finds. A camera can find visible dents, damaged ends and missing or wrong codes on cans. It cannot see inside a double seam or find a pinhole; those need seam inspection and leak testing.

SOURCES FOR THIS SECTION

1. Regulations relating to the labelling and advertising of foodstuffs (R146, 2010) (https://globalfoodlaws.georgetown.edu/wp-content/uploads/2021/12/South-Africa_2010.03.01._Regulations-Relating-To-the-Labelling-and-Advertising-of-Foodstuffs_No.-R.-146_EN.pdf) `(gazette copy, read 2026-09-25)`
2. Regulations governing general hygiene requirements for food premises (R638, 2018) (https://www.gov.za/sites/default/files/gcis_document/201806/41730gon638.pdf) `(gazette, read 2026-09-25)`

3. Legal Metrology Regulations (Government Gazette 41854, 2018) (https://www.gov.za/sites/default/files/gcis_document/201808/41854gon877.pdf) (gazette, read 2026-09-25)
4. FSSC 22000 Scheme Version 6, Part 2 (https://www.fssc.com/wp-content/uploads/2023/03/FSSC-22000-Scheme-Version-6-.pdf) (scheme document, read 2026-09-25)
5. GS1 South Africa: barcode verification service (https://gs1za.org/solutions/barcode-verification-service/) (read 2026-09-25)
6. BRCGS Food Safety Issue 8 FAQs (https://www.brcgs.com/media/2164733/brcgs-foodissue8faqsjuly2020.pdf) (read 2026-09-25)
7. National Consumer Commission: product recalls administered in Q1 2024/25 (https://thencc.org.za/media-statement-product-recalls-notice-update-on-20-product-recalls-administered-during-quarter-1-of-2024-25-to-date/) (read 2026-09-25)
8. NRCS food inspection presentation (canned product non-conformances) (https://knowledgehub.health.gov.za/system/files/2023-06/Presentation%20M%20Kutu.pdf) (read 2026-09-25)

// INTEGRATION

Conditions specific to food and beverage lines

These decide whether a station keeps working through cleaning and changeovers.

WASHDOWN

CONDENSATION

FOAM

Cleaning regime

Housings with a suitable IP rating (IP67 or higher where washdown hits them), cable glands and cable routes in the wash zone are chosen for your cleaning method and chemicals.

WE ASK

Cleaning method and chemicals

Cold containers sweating

Droplets on cold-filled containers scatter light and can look like defects. Lighting angle and check position are chosen to limit this.

WE ASK

Product temperature at the check

Foam and moving product

Foam can hide the true fill level, and liquid still moving after the filler leaves an uneven surface. The check goes where the level has settled.

WE ASK

Which products foam



CONTAINERS

Glass, PET and cans

Clear containers usually need a backlight to show the fill line. Glass reflects; aluminium cans and opaque containers hide the level altogether, so cans are checked on the lid, end and code.

WE ASK

Container materials and colours



CHANGEOVERS

Many SKUs, frequent changes

Each product needs a recipe. Selecting it from the line PLC at changeover avoids checking a new product against the old reference.

WE ASK

SKUs and how the product is selected



HYGIENE

Mounting around open product

Brackets above open product are agreed with your hygiene team so they can be cleaned. Where possible, equipment sits after the product is closed.

WE ASK

Hygiene zones and site rules

// LIMITS

What vision does not do on a food line

We agree these boundaries before a project starts.

Needs another method

- **Food safety testing.** A camera does not test the product or replace microbiological or chemical testing.
- **Foreign bodies inside the pack.** These need metal detection or X-ray inspection.
- **Seal integrity.** A cap can be present and straight yet not sealed. Leak tightness needs a leak tester.
- **Net content.** Fill level is not weight; declared quantity is proven with a checkweigher.

Works reliably when

- **Containers arrive consistently.** Stable spacing, with a trigger at the inspection point.
- **Lighting is shielded.** A shroud keeps daylight and wet reflections out of the image.
- **Recipes follow the product.** Selected by the PLC when the SKU changes.

// SAMPLES & ACCEPTANCE

What to send for a sample test

We test your own containers before proposing a station; quantities and shipping are agreed first. The same samples later define acceptance.

Sample preparation guide

Good product

Units from normal production, covering each container and label on the line.

Defect samples

Under-filled, badly capped, mislabelled and miscoded units, each marked.

Product behaviour

Whether it foams, is filled cold or hot, and arrives wet at the check.

Acceptance

False rejects on good product and missed defects on marked

samples, at line speed;
levels agreed per project.

// BY LINE

Food and beverage lines in detail

Three groups of lines with their own stations, South African rules and budgets.

Bottling and canning

Returnable crates, multipacks, can-end codes and dents, wine labels.

Bottling and canning →

Dairy, juice and bakery

Yoghurt cup lids and dates, straws on portion packs, bread bag closures.

Dairy, juice and bakery →

Meat, staples and dry goods

Weigh-price labels on trays, sachet and pouch codes, maize meal bags.

Meat, staples and dry goods →

// MANUAL INSPECTION

Why manual inspection struggles on these lines

Conditions on food and beverage lines that make checking by eye unreliable over a full shift.

- **Speed.** Filled and capped containers pass faster than anyone can look at each one, so manual checks become samples, and faults between two samples go on.
- **Washdown and condensation.** Wet, sweating containers and spray from cleaning make labels, codes and fill lines harder to judge by eye at the line.
- **Foam and moving product.** Right after the filler the surface is still moving and may foam, so a fill level judged by eye is a guess on an unsettled surface.

- **Many SKUs.** Flavours and pack sizes share similar labels and caps; after a changeover the wrong label can look almost right.
- **Shift fatigue.** Wrong codes and missing caps are rare, so hours of watching correct packs make the one faulty pack easier to miss.

These are reasons to automate the checks that are defined and visible, and to keep people for judgement and for fixing causes. The guide to manual or camera inspection compares the two.

// LINE SOLUTIONS

Line solutions for food and beverage

Complete stations for lines in this industry, each with the HIKROBOT hardware, installation and an indicative installed budget for a typical application in rand, excluding VAT. **All line solutions →**

LINE SOLUTION	FAULTS IT CATCHES	HIKROBOT CONFIGURATION	INDICATIVE BUDGET (EXCL. VAT)
Crate inspection	Missing, foreign and capped bottles; debris in empty crates	Overhead camera + VisionMaster, crate diverter	R 250 000 – R 1 370 000
Multipack inspection	Missing bottles or cans, missing caps, wrong product in the pack	Top-view vision sensor, or top + side cameras, pusher	R 80 000 – R 660 000

LINE SOLUTION	FAULTS IT CATCHES	HIKROBOT CONFIGURATION	INDICATIVE BUDGET (EXCL. VAT)
Can inspection	Missing, smudged or wrong can-end codes; visible dents in the can body	OCR vision sensor; four side cameras + VisionMaster DL	R 100 000 – R 1 180 000
Straw applicator inspection	Straw missing, doubled or skew; cap missing; date code missing or unreadable	Two HIKROBOT vision sensors after the applicator, air jet	R 110 000 – R 390 000
Yoghurt cup inspection	Foil lid missing or lifted; best-before and batch code missing or wrong	Vision sensor or two cameras + VisionMaster over the lanes	R 110 000 – R 680 000
Bread bag closure inspection	No clip or tag; date on the bag missing, unreadable or wrong	OCR vision sensor, or colour camera + VisionMaster DL OCR	R 80 000 – R 540 000
Weigh price label verification	Missing or wrong labels, wrong product, unreadable barcode, wrong date	Code reader + vision sensor or colour camera, tray pusher	R 160 000 – R 740 000
Wine bottle label inspection	Missing, skewed or wrong labels; capsule or seal missing; code unreadable	4–6 area cameras around the bottle + VisionMaster, reject	R 350 000 – R 1 170 000
Pouch inspection	Missing or smeared codes; product in seal, folds, open edges; short cartons	Vision sensor on the code, line scan over seals, air-jet reject	R 80 000 – R 930 000
Maize meal bag inspection	Wrong bag stock for the grade; missing or unreadable code; bag not closed	Vision sensor or 2 cameras in dust housings, bag reject	R 110 000 – R 770 000

LINE SOLUTION	FAULTS IT CATCHES	HIKROBOT CONFIGURATION	INDICATIVE BUDGET (EXCL. VAT)
Egg pack inspection	Missing eggs, open lids, missing grade or date mark, visibly cracked eggs	Two vision sensors or two cameras with deep learning	R 180 000 – R 850 000
Bottled water line inspection	Missing or crooked caps, broken bands, short fills, skewed labels, missing codes	Two vision sensors with backlight, or four views on a controller	R 190 000 – R 930 000

// FAQ

Food and beverage inspection questions

Can a camera detect under-filled bottles?

Usually, in clear or translucent containers where the fill line is visible, often with a backlight. Foam and condensation affect where the check goes. Cans and opaque containers need a different method.

How are date and batch codes checked on a bottling line?

A camera after the coder reads the code and compares it with the date and batch expected for the run (OCR/OCV). Missing, incomplete or wrong codes are rejected. We test codes from your own printer.

Can units in a case or multipack be counted before it is sealed?

Yes, where every unit is visible to the camera, for example from above an open case or tray. Units hidden under others or under opaque film cannot be counted from a single top view.

What are common food labelling mistakes?

Measured against R146, the usual ones are a missing or illegible date, a date not in day-month-year order or without the right wording, a missing batch number, allergens not declared because the product went into the wrong packaging, and required text printed too small. On the line they show up as a wrong label after a changeover, a smeared or missing code, or a label that did not stick.

How does inspection help if there is a recall?

A readable, correct batch code on every pack lets a recall be limited to the affected batches instead of a whole period of production, and R638 requires a traceability system and a recall procedure. Images and results stored per batch show what was checked and when.

Does vision inspection replace food safety checks?

No. It checks visible packaging features. It does not test the product, find a foreign body inside a closed pack or replace your food safety system and certification.

What does a bottle cap inspection system check?

A camera beside the neck checks that the cap is present, fully down and not tilted, and that the tamper band is there; a colour camera can also confirm the cap colour for the product. It does not measure torque or prove the seal is tight: that needs a torque tester or leak tester.

Can yoghurt cups and foil lids be inspected on the line?

Yes, for visible features: the lid is present and centred, the lid print and date code are correct, and no product sits on the sealing flange. Foil reflects strongly, so dome or diffuse light is used. Whether the seal is tight still needs a leak or seal-strength test.

RELATED: Product recalls in South Africa → Fill level, cap & seal → Label & print inspection → OCR/OCV & date codes → Agro-processing lines → How we deliver a project → All industries →

// FOOD & BEVERAGE

Request an assessment for your line

Tell us the containers, SKUs, faults and cleaning regime. We will say which checks apply and what a sample test needs.

Request a Vision Assessment