The miho DAVID 2 is the newest version of the Empty Bottle Inspector miho DAVID. It is the result of new ideas that have arisen from studying the miho DAVID in practice. The exterior construction has extensively been redesigned and in detail but the successful basic construction has been maintained and all hygiene aspects have been taken into consideration. The level of detection and operational safety have significantly been increased through design modifications and state of the art components.

The basic features of the miho DAVID 2 are:

**Outstanding inspection performance.**

*State of the art and energy-saving calculation methods. New image-processing technology,* using the recently developed miho Vidios® platform.

Continuous [digitised and flexible camera concept](#) with modern [CCD camera technology](#). Optimised lighting conditions through high performance [LEDs](#) using the latest technology.

Optimal [safeguard against extraneous light](#) through pneumatic removeable light cover.

**Hygienic construction:** slanted surfaces. Integrated contamination-proof pipeline cooling system. Extensive access to the inspection components with no remote areas subject to possible contamination.

**Consequent open modular construction:** possible modification through new inspection modules and functions. Easy to clean.
Inspection Units

1. **Base Inspection:**
   Detection and display of objects and contamination present at the bottle-base.
   Detection of transparent faults (for example, cellophane, glass fragments) due to an integrated bright field system with polarisation filter (for glass bottles).
   Optional: extension of visual angle for an improved inspection of bottles with long necks.
   New bottle-base blower with integrated suction (less contamination).

2. **Residual liquid Inspection:**
   Detection of residual liquid in the bottle, especially soda, by using the HF measuring process. With sensitivity adjustment control.
   Optional: Residual liquid inspection by using an infrared inspection process for the improved detection of organic liquids (for example, oil).

3. **Bottle-finish Inspection:**
   Detection and display of damage to the bottle-finish, in particular the sealing surfaces.
   Detection not just of "usual" external damage but also of internal damage (for example, cracks) by using a new lighting system.
   Optional: Underchip detection to detect damage on the side of the bottle mouth.

4. **Thread Inspection (optional):**
   Detection and display of damaged and incorrectly manufactured threads. The complete thread is recorded in one single image.

5. **Sidewall Inspection:**
   Detection and display of damage and contamination, even if it is very small, on the outer and inner bottle-wall, whilst reducing the fault detection rate caused by a build up of steam or water drops.
   Optional: Bright field system with polarisation filter to detect transparent faults (for example, cellophane).
   Also with integrated bottle sorting function, if required.

6. **Double sidewall detection (optional):**
   This has two camera systems facing one another at the bottle infeed and outfeed. This construction allows any dirt or damage, irrespective of which side of the bottle they are on, to be directly within the view of the camera and to easily be detected.

7. **Inner sidewall Inspection (optional):**
   Detection of three dimensional contamination on the inner wall of the bottle which cannot be detected from the outside because of, for example, ACL labels, relief printing.
David 2
Empty Bottle Inspection Machine

Operation

**TFT colour display:**
Installed into the front panel of the control cabinet, with touch screen and intuitively controllable operator interface. Alternatively, the display and touch screen can be installed in a swivel arm.

**Data processing:**
Extensive protocols and storing of all operating data. Compatible with the “Weihenstephan Standards”.

Performance

72 000 bottles per hour

System features

**Radical and open modular construction:**
Each separate function and sub-function of the machine does not only have its own technical component but is also independent and easily accessible. Component parts are also accessible (for example, the mirror system).

**Extensive possibilities of modernisation:**
This consequent open modular construction allows uncomplex and on-site modifications with new inspection modules and future developments. The miho David 2 is a machine that by upgrading can be kept state of the art technology even after years.

**State of the art technology. For example:**
- **State of the art calculation methods (energy-saving).**
- **Camera technology:**
  - Continuous digitised and flexible camera concept with modern CCD camera technology.
- **Special lighting systems and light techniques:**
  - Simultaneous implementation of different lighting processes. General use of LED lighting with a minimum lifetime of 100.000 operating hours.

**Hygienic construction:**

**Very solid mechanical components:**
- For example: Precision transport system for which all parts have been constructed to deal with the toughest of demands.

**Maintenance- and service-friendly:**
- The clearly-arranged and open construction allows an uncomplex maintenance. Option: miho Remote Access.
Remote maintenance

The miho remote maintenance module visualizes from a distance the current operation status (for example, counters and disruptions), the parameters and the images on an authorized computer. The remote distance module can be used to enter new parameters or to update them, to pre-set-up new bottle-types and to quickly and accurately analyze any faults. Access can be protected by individual passwords for different operator levels.

The remote maintenance can be done using DSL, the company network or a modem and is secured by VPN technology.

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Periphery

Infeed inspection:
Sorting module miho Unicon (sensor technology). Rejects bottles that are too high, too low or broken before they enter the machine and without the conveyor being stopped.
Alternatively, with a large performance range: the Sorting System miho Multicon (camera-based). Sorts bottles using several optical criteria. This leads to the highly differentiated detection of the “right bottle”. Rejection or diversion of different bottle-types takes place without the conveyor being stopped.

Reject Systems:
Options:
- miho Pusher / Eccentric precision reject system
- miho ESF2 / miho Leonardo (especially for PET)
- Separate rejection by another reject system.

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Base Inspection
Residual liquid Inspection
Bottle-finish Inspection
Thread Inspection
Sidewall Inspection
Inner sidewall Inspection
Sorting Module
Reject System
Sep. Reject System

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Pressureless and back jam free area

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