



**FOREIGN OBJECT INSPECTION**

**HEUFT *eXaminer* XAC**



## Foreign object inspector in accordance with the HEUFT CleanDesign

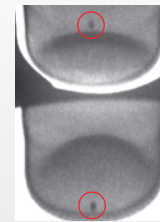
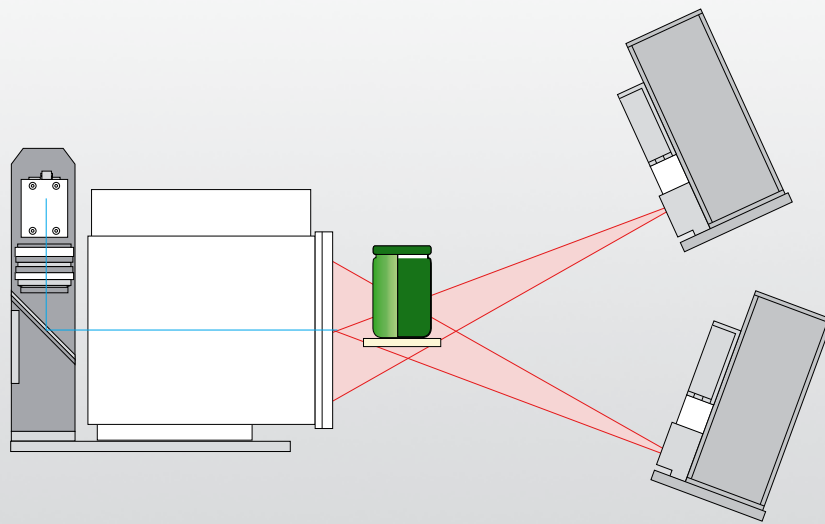


Foreign objects in containers filled with liquid, paste-like or spreadable food are a real safety risk. Therefore it is important to track them down whilst still on the production line and to remove the packages in question early enough from the production flow. The compact HEUFT eXaminer XAC, in accordance with the hygiene-friendly HEUFT *CleanDesign*, continuously monitors the product safety and identifies minute glass splinters,

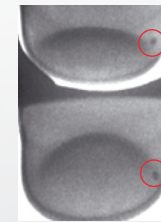
small pieces of metal, plastic particles, wood shavings and many other types of contamination even in non-transparent products. It consistently rejects contaminated containers.

The unique, pulsed X-ray technology of the inspection system in combination with the HEUFT *reflex* high-performance image processing system ensures a high degree of detection reliability with an

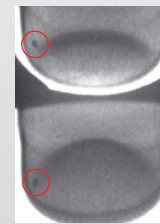
unequalled low radiation exposure. It is ideally suitable for hygienically sensitive lines due to its construction which has been optimised for cleaning. The HEUFT eXaminer XAC can be integrated into existing lines without a problem due to its compact dimensions.



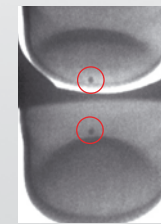
Foreign object at the front



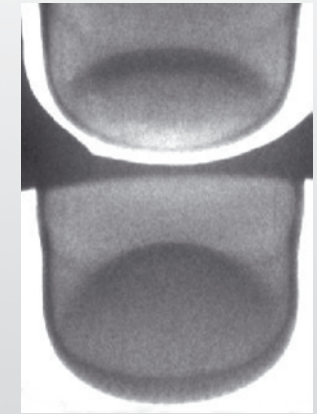
Foreign object on the right



Foreign object on the left



Foreign object at the back



Camera picture of a good container

## Base inspection



### Compact design - "no blind spots"

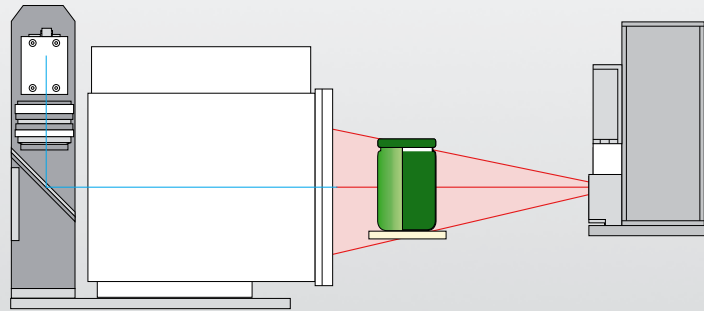
Heavy foreign objects sink to the container base. A precise inspection in this area is difficult due to the often curved base. The HEUFT eXaminer XAC solves this task in a convincing way.

Two X-ray strobes illuminate the lower area of the respective container at an

angle from above and below. Blind spots are thus ruled out.

The pictures of the views are evaluated together. The software which has been specially developed for this task links the information from both picture areas. This procedure increases the accuracy of the inspection enormously. In addition the vertical arrangement of the X-ray generators makes a very compact construction

of the system possible and contributes considerably to the particularly small dimensions of the HEUFT eXaminer XAC.



Foreign object



Foreign object



Foreign object



Foreign object



Camera picture of a good container

### Sidewall inspection



Foreign objects only sink slowly, or not at all, to the container base in paste-like, very thick or spreadable products depending on their weight and shape; they "float" freely in the product. The HEUFT eXaminer XAC can be equipped with a sidewall inspection as an option in addition to the base detection in order to be able to detect these nevertheless. Either one or two X-ray strobes

are used depending on the height of the container.

Those areas where the transition between the headspace and the product or the glass thickness at the edge make the inspection difficult can also be exactly examined with the evaluation software developed by HEUFT especially for this task.



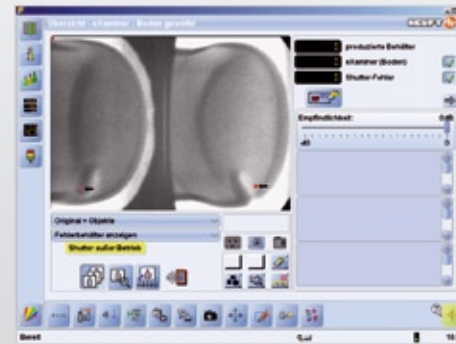
The HEUFT *reflex* image processing card

## The HEUFT *reflex* image processing system

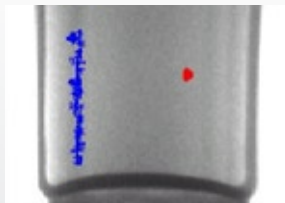


Combining two camera pictures in real time can only be achieved by using extremely powerful image processing technology. The calculating speeds of image processors available on the market are quickly exhausted in this connection and can only meet these requirements at low production outputs. These basic processing steps can be carried out in a very short time on

a hardware level by using the HEUFT *reflex* image processing card which has been specially developed for such tasks. This leaves more time for the software controlled picture analysis. The result is a level of accuracy which is unparalleled on the market.



## The HEUFT *nbx* filter technology

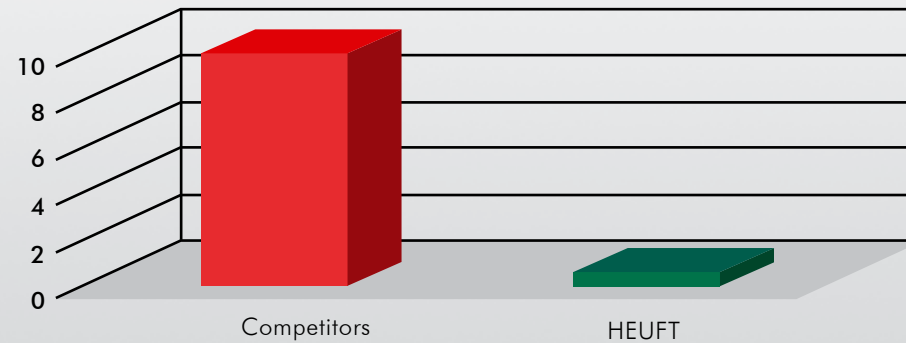


The inhomogeneity of a product and variations in the thickness of the glass cause an uneven absorption of the X-radiation. This has to be detected and taken into consideration by the software so that these effects do not cause false detections.

The HEUFT *nbx* technology provides filters e.g. which identify air bubbles in the product or knurling marks and

clearly differentiate them from dangerous foreign objects. In this way small foreign objects hidden behind such structures can also be identified.

In contrast to other systems the respective alignment of the containers is irrelevant for this.



Average X-radiation

## X-ray strobe

The specially developed X-ray strobes of the HEUFT eXaminer XAC emit considerably less radiation compared to inspectors with permanent radiation sources. They are only activated for a fraction of a second when there is actually a product to be inspected in the inspection area.

The radiation dose for each product is also considerably less than in the case

of the classic line scanner because a short X-ray flash is sufficient in order to cover the total container volume of a container completely. This ensures that it is not exposed to radiation for longer than absolutely necessary even at slow conveyor speeds. The flashing process prevents motion blurs in the high-speed sector of up to 60,000 packages per hour.

Furthermore the components of the inspection device are subjected to less wear and tear because they are only activated when a product actually has to be X-rayed. The low amount of radiated power has a positive effect on the amount of space required by the system because all the protection devices are already integrated.



## The HEUFT CleanDesign



The HEUFT eXaminer XAC is predestined for use in hygienically sensitive areas due to its easily accessible construction which has been optimised for cleaning in accordance with the HEUFT *CleanDesign*.

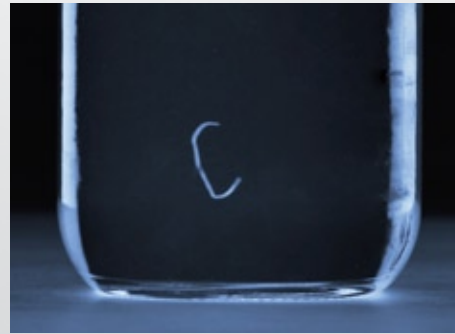
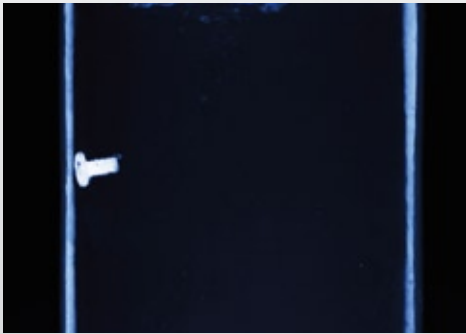
The device has a sloping machine platform so that so-called "dirty corners" cannot occur in the first place. It facilitates cleaning and prevents contamination accumulating and settling persist-

ently. The liquids required for cleaning purposes can be drained off completely via special channels and openings. Consequently dangerous germs and bacteria have no contact surface whatsoever.

Specially designed doors make optimum accessibility possible; the device casing and the integrated inspection cabinets are completely hinged. The electronics of the system are totally encapsulated.

The casing and the inspection cabinets are dust-proof and protected against contact as well as water jets.

The HEUFT eXaminer XAC can also be integrated into existing production lines afterwards without a problem due to its slim dimensions.



## Specifications

### Detection accuracy

The following specification values are aimed for as regards the base and side-wall inspection in the case of standard containers with curved bases:

- a glass ball with a diameter  $> 3$  mm is identified as a fault with a reliability of at least 98% and rejected
- a steel ball with a diameter  $> 1$  mm is identified as a fault with a reliability of at least 98% and rejected
- the false rejection rate (number of containers without an identifiable fault in relation to the total number of containers produced) is less than 0.1%

The exact specifications using original sample containers can be determined for individual packages upon request.



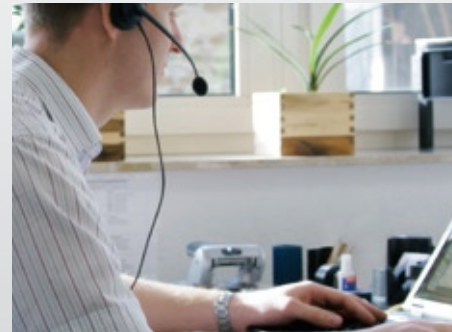


## Your cost advantages with HEUFT



We do everything in order to combine the very highest quality with fair prices:

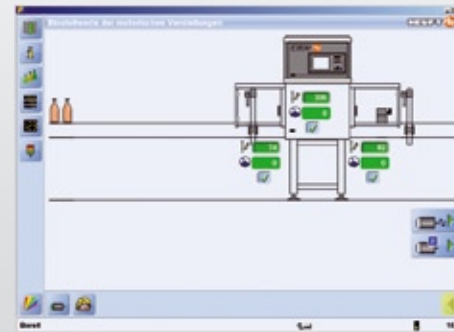
- shorter downtimes
- no change parts necessary
- minimum cleaning required due to the HEUFT *CleanDesign*
- cost-cutting due to reduced downtimes and ensuring the production flow
- series production due to the modular design of the HEUFT *SPECTRUM* series
- easy integration into existing lines
- advantageous spare parts storage
- fast trouble shooting
- fast changeover times
- cost-cutting due to reduced downtimes and ensuring the production flow
- high development performance so that the devices are optimally geared to the task
- robust and stable components
- increased service life
- low wear and tear
- low failure rates
- the HEUFT *TeleService* cost savings - the service technician must not be called out



## Networking



- access to all networks with Ethernet and TCP/IP - equipped with two Industrial Ethernet interfaces by default
- connection to a preconfigured DDE interface and SQL database
- single button operation via jog shuttle with the most advanced TFT display
- the HEUFT *PILOT* graphical user surface with a comprehensible menu structure for easy operating
- automatic transfer of counter readings or fault messages by SMS to a mobile phone or by email if required
- firewall protected connection to the remote service by Ethernet – the HEUFT *TeleService* can access the line directly and rectify faults at short notice by means of remote diagnosis if the customer wishes



## Device operation and the HEUFT PILOT



- multilingual, simply arranged, comprehensible menu structure with extensive help boxes and complete online user's manual - the user interface can be supplied in any language / graphic characters if required
- password-protected operator levels which can be freely adjusted to suit the tasks of the operating staff, the quality assurance department etc.
- easy identification of spare parts with online and offline spare parts list with photographs and exploded views - the order can be sent from the device either to an internal purchasing department or directly to HEUFT
- the operator receives all the information during a brand changeover regarding the necessary steps in order to exclude possible operating errors
- clear fault messages with service notes and support in order to avoid downtimes

The HEUFT *flip*The HEUFT *DELTA-K*The HEUFT *DELTA-FW*

## The HEUFT *rejector*

The following rejection systems can be directly integrated into the HEUFT eXaminer XAC foreign object inspector:



### The HEUFT *flip*

- single-segment, high-speed rejector for cylindrical containers
- particularly smooth transversal acceleration of the containers
- very compact construction

### The HEUFT *DELTA-FW*

- reliable upright rejection due to a virtual follow-on multi-segment rejection curve
- particularly suitable for heavy containers

### The HEUFT *DELTA-K*

- multi-segment rejector as a virtual follow-on guide rail

- upright rejection of shaped containers by means of single point guidance

### The HEUFT *mono*

- single-segment, high-speed rejector for cylindrical containers
- very compact construction
- suitable for steady containers



The HEUFT eXaminer XT



The HEUFT eXaminer XB



The HEUFT InLine

## Other HEUFT products



The following HEUFT systems are available for similar tasks:

### The HEUFT eXaminer XT

- pipeline inspection for detecting foreign objects in an unpackaged liquid or paste-like product mass
- speed-independent X-ray inspection
- optionally available dual beam technology

### The HEUFT eXaminer XB

- a top-down inspector for unpackaged and packaged products lying on the conveyor
- high degree of detection reliability and low radiation exposure due to a pulsed X-ray inspection
- clear differentiation between actual faults and tolerable packaging structures or product inhomogeneities

### The HEUFT InLine

- the inspection of empty containers before they are filled
- base, sidewall, thread and finish inspection
- modular construction for simple upgrading and retrofitting



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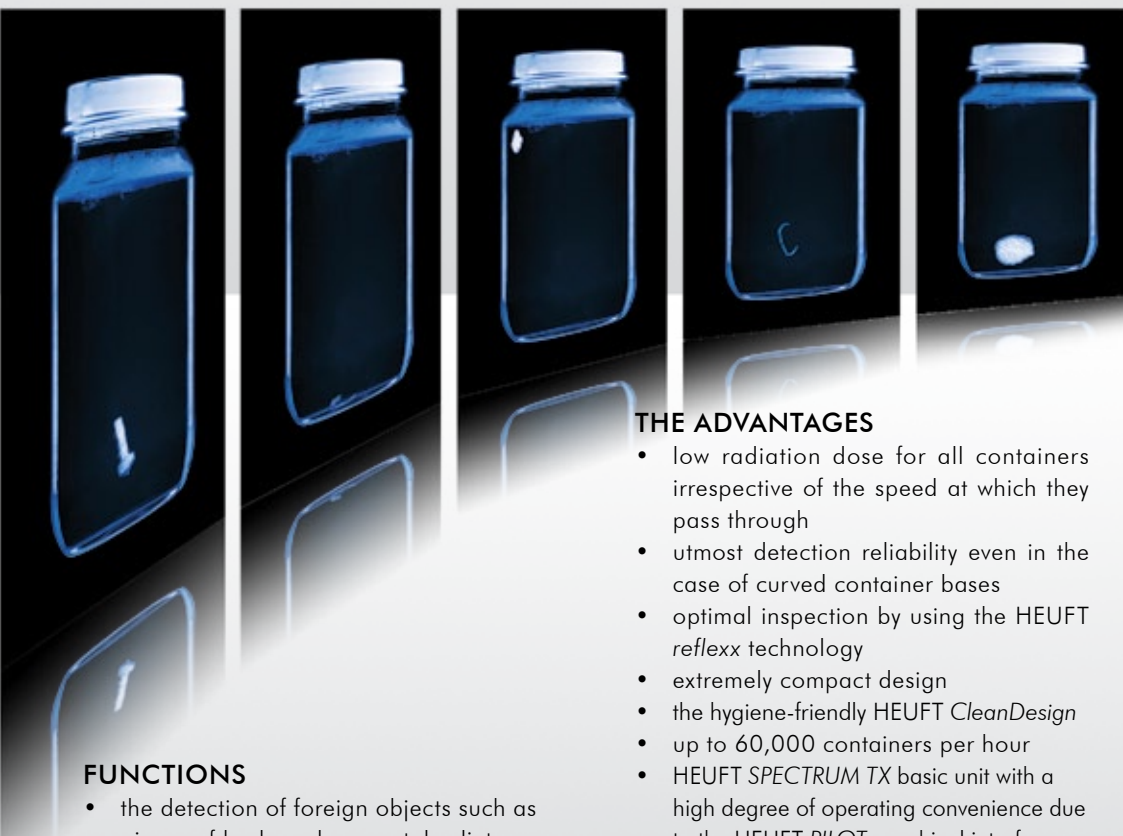
The use of the HEUFT *nbx* filter technology makes it possible to differentiate between foreign objects and container structures / product inhomogeneities and therefore reduces the false rejection rate of the device  
[\[more\]](#) \*

One casing can accommodate several compact X-ray generators and cameras  
[\[more\]](#) \*

Graphic display of all the statistically acquired values  
[\[more\]](#) \*

Sloping machine platform to prevent "dirty corners"  
[\[more\]](#) \*

## The HEUFT *eXaminer XAC* foreign object inspection for liquid, paste-like and spreadable food



### THE ADVANTAGES

- low radiation dose for all containers irrespective of the speed at which they pass through
- utmost detection reliability even in the case of curved container bases
- optimal inspection by using the HEUFT *reflexx* technology
- extremely compact design
- the hygiene-friendly HEUFT *CleanDesign*
- up to 60,000 containers per hour
- HEUFT *SPECTRUM TX* basic unit with a high degree of operating convenience due to the HEUFT *PILOT* graphical interface
- supplied as a complete solution including conveyor with integrated rejection table  
[\[more\]](#) \*

### FUNCTIONS

- the detection of foreign objects such as pieces of broken glass, metal splinters, pieces of plastic, stones etc.
- base and optional sidewall inspection  
[\[more\]](#) \*



\* [\[more\]](#) detailed information on [www.heuft.com/xac](http://www.heuft.com/xac)

