XRAY SHARK®
XBD50/XBD51
X-Ray Inspection System
for Glass-in-Glass Detection

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The Most Advanced Detector Design for Highest Speed and Sensitivity
The high-energy X-ray Scanner and the XIA high-performance computer image analysis system inspect the product. Sophisticated image processing software provides immediate analysis, detection and rejection — automatically. That makes Cassel inspection systems superior in detecting product contamination or deviation from accepted specifications.

Designed for Industry Standards
In order to comply with certification programs and satisfy HACCP requirements, the XBD50 and XBD51 are available with “SHARKNET®” software, a process control package for automatic data collection and image storage for quality control and production scheduling.

Straightforward operation with minimal effort
The XBD50 and XBD51 series of conveyor inspection systems is designed for simple and efficient operation. The software can be adjusted perfectly to the product, enabling full use of the image data. The software adjusts all complex settings on its own. The “normal x-ray image” of the product is automatically calculated and tested for abnormalities. With a few settings, tolerance towards deviations can be reduced or increased.

Easy maintaining
The inner workings of the XRAY SHARK® are clearly structured and all components can be connected and disconnected very easily. This allows for quick and easy maintenance.

Detectable contaminants
The size of the detectable contaminants depends on the consistency, density, thickness and structure of the product. Therefore, to confirm the exact sizes of detectable contaminants a test with the customer product can be performed.

XRAY SHARK® - the better solution
The XRAY SHARK® XBD50 and XBD51 can be used with existing glass jar conveyors, or an integrated conveyor can be ordered.

The XRAY SHARK® XBD50 and XBD51 use the latest high-sensitivity linear sensors. The combination of high-energy inspection technology, up-to-the-minute hardware and high performance image processing software provide clear advantages for the optimal protection of your product and your brand.
**SuperContrast**

The SuperContrast function enhances small dense (dark) structures in the image. This improves detection of small foreign bodies, which then become visible.

**AutoEdge**

Cassel’s unique AutoEdge function finds the edge between jar wall and product, even though the wall thickness varies due to production tolerances. As a result, glass pieces are detected even at the wall edge or bottom bulge.

**Mask**

The mask features exclude certain areas of the image from foreign object detection, e.g. the very dense jar bottom. This improves the detection performance in the remaining product.

**Adaptive Teach**

The adaptive software learns the structures of thousands of jars. The software recognizes in milliseconds which taught structure fits best to the current image, and subtracts that structure. As a result are glass pieces detected even in the lid area.

**Easy Control**

Color coded and graphical sensitivity settings. The impact of an adjustment is simultaneously projected into the x-ray image.

**Data Transfer and Reporting**

Cassel’s SHARKNET ® 2 software networks XRAY ® SHARK X-ray machines to a Windows computer. The operating data are automatically recorded and displayed as a report. Manual records are no longer required. With SHARKNET ® 2, the IFS and HACCP documentation is simple. The software collects all necessary data into a SQL database and prints the required report at specified intervals automatically.

**Safety**

Top notch german safety standards certified by TÜV.

**Glass Jar In/Outfeed**

The X-rays at the in- and outlet must be shielded. Conventional leakage prevention curtains would interfere the transport of glass jars. Cassel offers two curtain-free shielding versions:

- 90-degree curve in/outfeed
- Overlong tunnel in/outfeed

**Maximum Operation Time**

The product tunnel is equipped with quick access doors. A broken glass jar or a product jam can be cleared immediately within minutes. Opening the access doors automatically stops the x-ray radiation.

**Reject devices**

As an optional equipment offers Cassel two reject device versions. Both are specifically designed for glass jar reject:

- High speed reject, with parallel receive conveyor
- Low speed reject, with reject receive tray
<table>
<thead>
<tr>
<th>Model</th>
<th>XRAY SHARK ® XBD50 Dual Beam</th>
<th>XRAY SHARK ® XBD51 Single Beam</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-ray source</td>
<td>Dual beam x-ray with max. 120kV (2x400W)</td>
<td>Single beam x-ray with max. 120kV (400W)</td>
</tr>
<tr>
<td></td>
<td>Beam shoots sideways through the product</td>
<td>Beam shoots sideways through the product</td>
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<tr>
<td></td>
<td>variable in voltage + current</td>
<td>variable in voltage + current</td>
</tr>
<tr>
<td></td>
<td>integrated closed oil cooling circuit</td>
<td>integrated closed oil cooling circuit</td>
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<tr>
<td>Cooling</td>
<td>Highly efficient, silent DC filter fans</td>
<td></td>
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<tr>
<td>X-ray detector</td>
<td>Diode size 0.8 mm, optional 0.4 and 0.2 mm</td>
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<tr>
<td>Radiation leakage</td>
<td>3 µSv/h or less @ 10cm outside cabinet surfaces</td>
<td></td>
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<tr>
<td>Safety</td>
<td>Special product tunnel, Magnetic safety switches at cabinet doors and tunnel hatches, emergency stop push button, Emergency stop in/out interfaces to safety circuits of production line, x-ray off key switch, PILZ safety circuit</td>
<td></td>
</tr>
<tr>
<td>Housing finish</td>
<td>Stainless steel grade AISI 304 / ISO 1.4301 (CrNi 18/10)</td>
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<tr>
<td>Degree of protection</td>
<td>Overall: IP54 (according to IEC 60529), including touch panel and fans, product tunnel: IP66</td>
<td></td>
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<tr>
<td>Access to product tunnel</td>
<td>4 pcs. Quick Access Doors (at In/Outfeed, from Top/Bottom)</td>
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<tr>
<td>Conveyor type</td>
<td>Modular belt optional</td>
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<tr>
<td>Conveyor speed</td>
<td>Conveyor speed by product, 30-60 m/min</td>
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<tr>
<td>Flow rate</td>
<td>Max. 300 pieces per minute</td>
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<tr>
<td>Max. Product Dimensions</td>
<td>Max. 150mm Ø x 250 mm Height</td>
<td></td>
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<tr>
<td>Product memory</td>
<td>250 different product set-ups</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>17&quot; Color-TFT capacitive Touchscreen</td>
<td></td>
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<tr>
<td>Inspection features</td>
<td>Auto Calibration, Auto adaption to density distribution, Density, Hard Contrast, Soft Contrast, Masking Technology, SuperContrast, SizeFilter, AutoEdge, Images AutoSave/Load, Multi Segment Inspection, Metal Can inspection, Fill Level, Glass Container Format by Product, Generator Energy by Product, Password protection</td>
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<tr>
<td>In/Outputs</td>
<td>Programmable outputs (contamination, ready, Emergency Stop)</td>
<td>Programmable inputs (Emergency Stop, wake up, optional control signals)</td>
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<tr>
<td>Data transfer and reporting</td>
<td>Ethernet for remote support via internet, USB for external keyboard/ mouse/ memory stick</td>
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<tr>
<td>Other features</td>
<td>Direct variable conveyor speed by product, Intel Core i, MultiCore CPU, Win OS</td>
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<tr>
<td>Supplied test equipment</td>
<td>Certified test cards with soda lime glass, ceramics, steel spheres in various diameters</td>
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<tr>
<td>Available accessories</td>
<td>Radiation counter, SHARKNET® data management software, pusher systems</td>
<td></td>
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<tr>
<td>Weight</td>
<td>1,5 t</td>
<td>1,5 t</td>
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<tr>
<td>Electrical mains connection</td>
<td>400VAC/3+-N (or 230VAC, depending on Options), 50-60 Hz, ext. Fuse C16A</td>
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<tr>
<td>Compressed air supply</td>
<td>Without reject system 0 (zero)bar</td>
<td>With optional reject system minimum 4 bar</td>
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<tr>
<td>Environmental conditions</td>
<td>0 to +30 ° C, with relative humidity max 90% non-condensing</td>
<td>Optional: Additional cooling device, for ambient temperature up to 45° C or high humidity environments</td>
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<tr>
<td>Conformity</td>
<td>CE, compliant to German x-ray regulations, specific adaptation for other countries</td>
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</table>

* All information is based on standard devices. There possibly will be differences depending on the application. Changes and errors excepted.
XRAY SHARK® XBD50/XBD51
Example Product flow concept

CASSEL’s scope of supply
- Dual Beam X-Ray
- Jar conveyor through x-ray (modular belt, steel plates)
- Reject system

Customer’s scope
- Separation of jars
- Receive conveyor for contaminated products
- Modification at existing production line

- Jars coming separated from packaging, separated minimum 100 mm
- Line Height 970 mm
- Conveyor speed max 55 m/min
- Ca. 1080 mm
- 310 mm
- 700 mm
- 1420 mm
- 1400 mm
- 5000 (x-ray incl tunnels)
- 1000 mm
- Operating panel
- X-Ray
- Additional cooling device
- Revision door
- Pusher
- Receive conveyor for contaminated products
- Doors for cleaning (at top and bottom) Allows washdown of broken jars from the x-ray tunnel.

Customer fits both conveyors together, for smooth jar transfer.

Customer takes care for jars separation: minimum a 100 mm gap between two jars.
Metal Detection, Checkweigher and X-Ray

With its production facilities located near Hannover, Germany, Cassel manufactures approximately 1,000 inspection systems annually. Nearly 80 percent of Cassel equipment is exported to the European Union, United States, Southeast Asia, Australia, South Africa and South America. Cassel supplies equipment to several industries, including food production, plastics, pharmaceuticals, textiles, forestry and mining. Cassel machinery can be found in the production lines of many global and respected brands.

Customers receive valuable service and support wherever their product inspection systems are located around the world. Over 50 representative offices around the globe provide service performed by factory-trained technicians.

Since 1994, Cassel Messtechnik GmbH (Cassel) has led the production machinery industry in the design and construction of metal detection, checkweigher and x-ray inspection systems for industrial applications. Cassel systems specializes in protecting valuable production machinery against damage caused by undiscovered metal parts. Cassel also succeeds in quality control in the consumer goods industry. Cassel strives to supply quality and high performance at a reasonable price.

Cassel Messtechnik GmbH (Germany) – Headquarters and main production site

Cord Cassel
Managing Director of Cassel Messtechnik GmbH