Working with you every step of the way

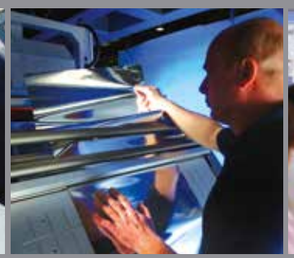
Our extensive R&D investment is directed at meeting the challenges of the fast-changing food industry around the globe.

We aim to support our partners fully, from the very start of the buying process, and you will find many equipment brochures, visual animations and case studies available on our website. When you are ready to make contact, a well-resourced network of Ishida companies, distributors and agents, extending across Europe, the Middle East and Africa, can provide advice and organise demonstrations and trials.

Installation is rapid and efficient. For integrated packing lines, we use proven project management techniques and methodologies, tuned to your key objectives and specifications.

A dedicated pan-European service engineering team helps to maximise the performance, functionality and reliability of our installed base. In addition, spares facilities are strategically placed throughout the territory, offering 24-hour delivery in most cases.



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(E) X-RAY 11.16

IX SERIES

Ishida X-ray Inspection System
Protecting your customer and your brand

Ishida X-ray Inspection Systems

Ishida X-ray inspection can be used at any stage in your production line to identify with the greatest accuracy and reliability when foreign bodies are contaminating your product, thus protecting your brand and reassuring your customers.

Benefits of an X-ray inspection system

X-ray inspection has several key benefits, especially for food producers, that are fundamentally linked to safety and quality:

Brand protection
- Customers will trust the product

Food safety
- The food is free of foreign bodies and safe to eat

Can do much more than just finding foreign bodies:
- Counting components
- Weight estimation
- Checking fill level
- Detecting flaws such as missing or broken items
- Measuring product size
- Sealing control

All these functions in one machine lead to a cost-effective and efficient performance

Cost savings due to no product recalls and customer complaints
- Fewer recalls and customer complaints lead to less fines

Confidence
- You as a supplier are using the state-of-the-art technology and can therefore be confident of quality

Due diligence / auditing
- Up-to-date records of all products including rejects, with all data and images stored securely

Finds metal, glass, stone, bone, shell, rubber and dense plastics

IX SERIES

How Ishida X-ray works

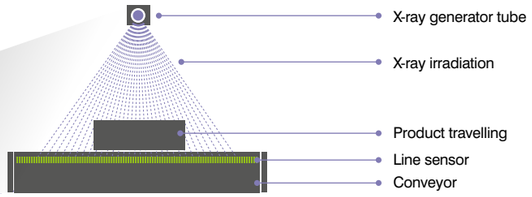
X-rays are used to see through objects to get a clear picture of what is inside. Ishida X-ray inspection systems are primarily used to detect foreign bodies such as dense plastic, rubber, metal, bone, shell, stones or glass to prevent them from contaminating a product.

Principles of X-ray inspection device

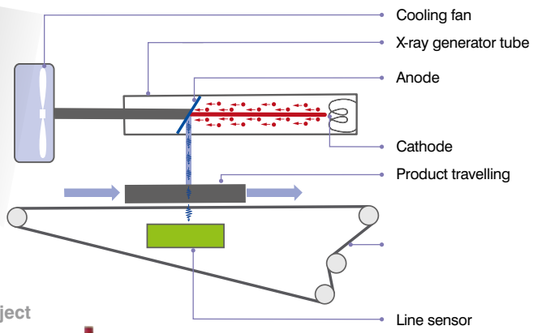
X-rays are transmitted onto the product. A line sensor captures an image formed by the penetrating X-rays and a complex image analysis procedure identifies foreign material or defective/missing products.

As well as spotting any foreign bodies, X-ray machines can detect a wide range of product defects, and can also check product or piece weights.

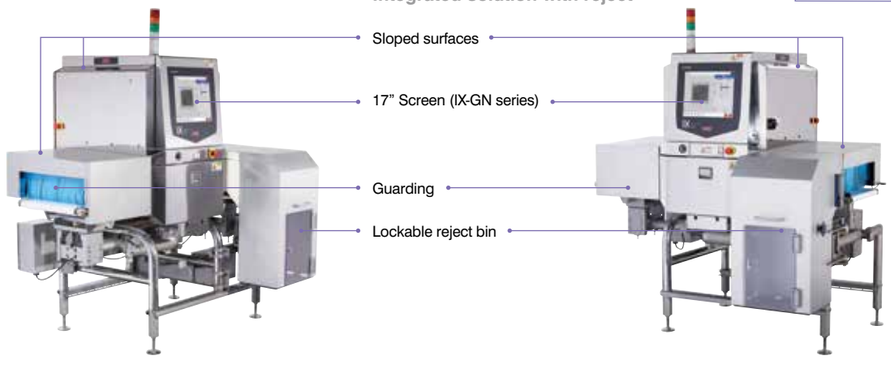
End view



Front view



Integrated solution with reject



Highly sensitive foreign body detection using Genetic Algorithm (GA) technology

What if detection is needed for multiple types of foreign bodies in one product?

Evolutionary image processing* (GA)

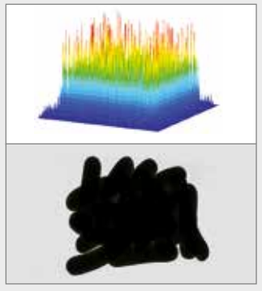
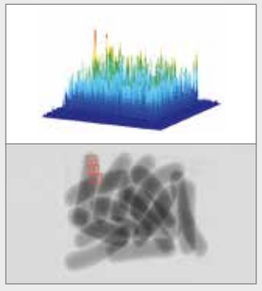
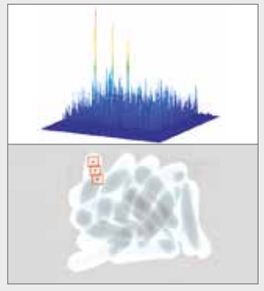
GA (Genetic Algorithm) is a patented technique which is used exclusively in our IX Series. It allows you to accomplish a very high detection sensitivity on your products which cannot be accomplished anywhere else.

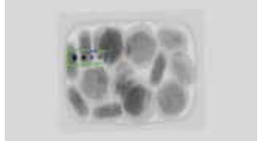
The use of GA allows the user to optimise the X-ray machine for their own unique product characteristics. Each GA can be tuned to focus on a specific foreign body that pose an inherent risk to the product. As such, every Ishida instrument can be uniquely and easily optimised to meet your specific challenges.

GA benefits

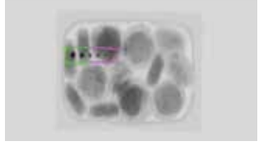
- Improves sensitivity and detection rate
- No need to send product or contaminant to a manufacturer's lab – everything is done on site
- No need for service engineer or operator intervention

Example: detecting foreign matter in a pack of sausages

X-ray image with no algorithms applied	X-ray image with initial applied imaging software	X-ray image with final imaging software
		
Unevolved image processing Foreign matter cannot be identified from the uneven profile of the sausages	**Image processing in evolution** Background product effect is reduced enabling foreign bodies to be identified	**Evolved image processing** The background product effect is further reduced enabling foreign bodies to be identified



Without Genetic Algorithm



With Genetic Algorithm

* "Evolutionary image processing" is a registered trademark of Yokohama National University.

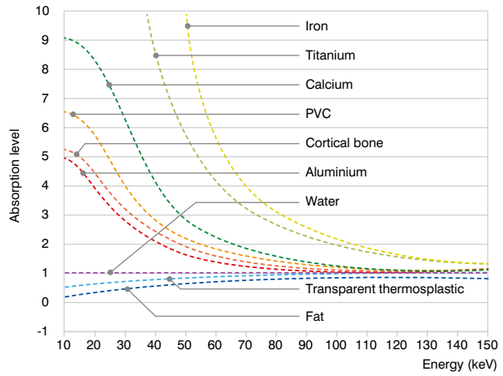
The benefits of low voltage

For contaminants of low density, such as bones in meat products, lower voltage X-rays created by using less kV show a greater difference between the elements.

Our most popular model of IX machines uses a 300W generator, which allows us to vary the kV value from 25-75kV and the current from 1-8mA (depending on the model).

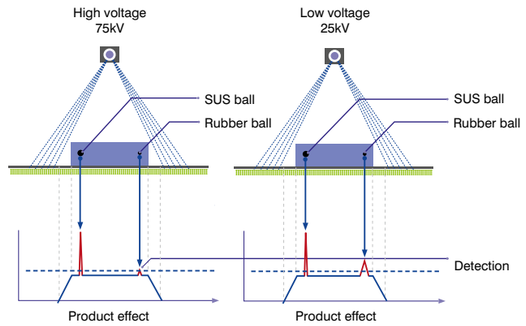
The ability to vary the KV and mA gives Ishida a strong advantage in the detection of lower density foreign bodies.

The graph below shows how different materials behave with low and high levels of energy. The lower the energy, the higher the absorption difference which leads to better detection results.



Examples with rubber ball

The image below depicts the effect of using lower voltage X-rays, with the rubber ball being more clearly visible in the right hand image, because the rubber stops a greater percentage of the X-rays penetrating through when lower energy is used.



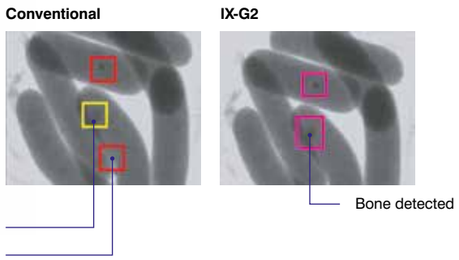
IX SERIES
Range Overview

IX-G2 SERIES

Dual Energy Sensor detects what other inspection systems miss

Most effective X-ray detection of low-density objects, including bone, shell, metal, glass and rubber.

- Pinpoint detection of foreign bodies under 0.6 mm thanks to enhanced G2 technology, from shell and stone, to metal and bone.
- Accurate X-ray inspection capable of handling packaged products with uneven surfaces, granular products and overlaps.
- Ergonomic, stainless steel design, making it easy to clean.



IX-G2

Complex* products from 0-60mm

Examples of complex products


Poultry


Vegetables

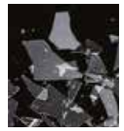

Cereals


Overlapping meat products

Low density foreign bodies


Bones


Stones


Glass

* Products which include different thicknesses, are overlapping etc.

For detailed information on the applications the IX-G2 series can handle, please refer to the “Foreign Body detection matrix” table on the page 15.

IX-GN SERIES

The definite choice for a wide range of products

GN series provides high-performance X-ray inspections for an unrivalled range of foreign matter.

- Unrivalled versatility for a wide range of packed and unpacked products.
- GA image processing automatically generates optimal sensitivity for fast and efficient product changeovers.
- Integrated air conditioning system.
- User-friendly 17” touch screen control.
- Ergonomic, stainless steel design, making it easy to clean.

IX-GN

● Uniform* products (0-220mm)

Examples of uniform products


Bread, cookies


Cheese


Confectionery


Ice cream

● Complex products (above 60mm)**

Examples of complex products


Meat


Cereals


Yoghurt pots


Sausages

High density and low density foreign bodies


Stainless Steel Ferrous/ Non-ferrous


Glass


Teflon, PVC


Stones

* A group of products that are standardized or identical.
** Products which include different thicknesses, are overlapping etc.

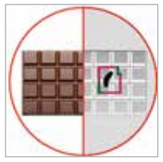
For detailed information on the applications the IX-GN series can handle, please refer to the “Foreign Body detection matrix” table on the page 15.

IX-EN SERIES

Your first step into Ishida X-ray technology

The X-ray inspection system that enhances quality control on your production line, both affordably and effectively.

- Reliable inspections suitable for uniform products.
- Easy to set up and integrate into your production line.
- User-friendly 15” touch screen control.



IX-EN

Thin products (0-50mm) - XX62/63

High density and low density foreign bodies

Thick products (50-150mm) - XX93

High density and low density foreign bodies

Examples of thin products

Chocolate bars

Cereal bars

Sliced cheese

Dried Fruits

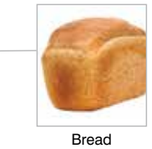
Stainless Steel Ferrous/Non-ferrous

Glass

Rubber

Teflon, PVC

Examples of thick products



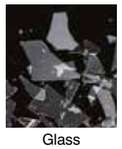
Bread

Yoghurt pots

Pastry

Cake

Stainless Steel Ferrous/Non-ferrous



Glass

Stones

For detailed information on the applications the IX-EN series can handle, please refer to the “Foreign Body detection matrix” table on the page 15.

IX-GA-65100 SERIES

All the security of X-ray inspection for larger items

The IX-GA-65100 series machines are designed for inspection of larger product, such as large boxes or cases.

- With an inspection chamber height option of 390mm the IX-GA-65100 can inspect, for example, a 25kg (option 50kg) block of butter.
- With X-ray tube voltage of up to 100 KV, IX-GA-65100 can handle a 65cm-wide case of snack bags or a craft bag of powdered ingredients.
- Items can be up to 650mm wide.

IX-GA 65100

Larger products

High density and low density foreign bodies

Examples of larger products

Box carton

Sack of rice

Bag of pet food

Large block of cheese

Stainless Steel Ferrous/Non-ferrous

Stones

Glass

Ceramic

For detailed information about IX-GA-65100 series, please refer to the “Ishida X-ray differentiation” table on the page 14.

IX-GE-B3043

The highest level of inspection performance for bottled products

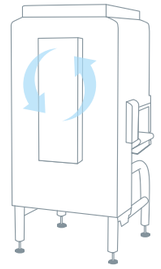
- Achieves industry leading sensitivity.
- The unique way that the Ishida side beam is designed means that no protective curtains are needed, ensuring perfect product transition.
- Automatic bottle pitch control.
- Easy-to-install in existing production lines.
- Small footprint.

*Water receptacle option

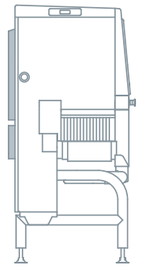
Sealed structure for improved reliability

The system boasts airtight seals to prevent any foreign bodies from infiltrating and avoid internal faults. The stream lined air-conditioner is fitted on the main unit, for a smooth and cohesive design.

Minimal design with clean lines



IX-GN
Internal air circulation



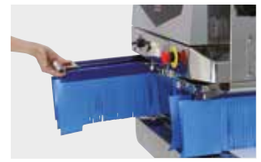
IX-GN
Fitted with compact cooler
(with 500W cooler)

Hygienic

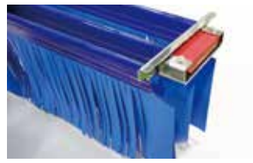
The device is HACCP-compliant (IP66), boasting an all-stainless steel structure and waterproof inspection chamber. The protective curtains and conveyor can be removed easily without tools.

Easy removal and refitting of components

GN model is supplied with Magnetic interlock. A mechanical interlock system on other models makes the process of removing and reinstalling protective curtains extremely simple, reducing the risk of damage to the switch.



Protective curtain



Non-contact switch (optional)

Magnetic interlock

IX-GE
B3043

Upright products

Examples of upright products

PET bottles

Pouch packaging

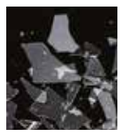
Tetra-pak

Cartons

High density and low density foreign bodies

Stainless Steel
Ferrous/Non-ferrous

Stones

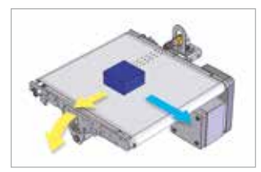


Glass

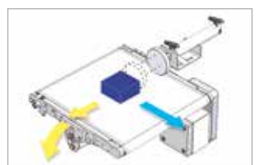
For detailed information about IX-GE-B3043 series, please refer to the "Ishida X-ray differentiation" table on the page 14.

Rejector lineup

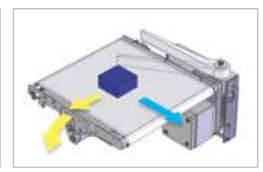
Once product with foreign body is identified, it must be rejected and moved off the main conveyor belt. Examples of some of the more commonly used reject solutions are shown below. However, the choice of rejector depends on the product and application.



Air Reject



Pusher Reject



Slap Arm Reject

Ishida X-ray differentiation

	IX-EN xx62/63	IX-EN xx93	IX-GN xx43/44	IX-GA-65100	IX-GE-B3043	IX-G2 xx27
Hygiene						
Sloped surface	●	●	●		●	●
Toolless disassembling for cleaning	●	●	●	●	●	●
Machine rating	IP54	IP54	IP65	IP65	IP65	IP65
Inspection chamber rating	IP66	IP66	IP66	IP66	IP65	IP66
Mechanical interlocks	●	●		●	●	
Magnetic interlocks			●			●
Image processing						
Standard image resolution for an optimum detection on small and hard foreign bodies	●					
High image resolution for a better detection on small and hard foreign bodies		●		●	●	
Finest image resolution for an enhanced detection on small and hard foreign bodies			●			●
5 levels of customizable and powerful algorithms	●	●		●	●	
7 levels of customizable and powerful algorithms			●			●
Dual Energy technology for enhanced detection of bone and other lower density materials and improved detection in overlapping products						●
X-ray power						
Minimized power range, perfect for thinner products	●					
Optimum power range for medium sized products		●				●
Full flexible power range suitable for a wide range of products			●	●	●	
Usability						
Quick production start up time (30-90 sec)	●	●	●	●	●	●
15” Remote Control Unit (RCU)	●	●		●	●	
17” Remote Control Unit (RCU)			●			●
Interfaces for saving images and statistics	USB, CF Card, Ethernet	USB, CF Card, Ethernet	USB, CF Card, Ethernet	CF Card, Ethernet	CF Card, Ethernet	CF Card, Ethernet

Foreign body detection matrix

			Foreign body					Natural
Product type	**Foreign body**		**Metal**	**Glass**	**Rubber**	**Teflon**	**Stone**	**Bone**
Uniform*	Dairy	Sliced cheese	● ◐	● ◐	● ◐	● ◐	●	
		Yoghurt	● ◐	● ◐	● ◐	● ◐	●	
		Ice-cream	● ◐	● ◐	● ◐	● ◐	●	
	Confectionery	Chocolate bar	● ◐	● ◐	● ◐	● ◐	●	
		Box with chocolate	● ◐	● ◐	● ◐	● ◐	●	
		Cookies	● ◐	● ◐	● ◐	● ◐	●	
	Meat	Minced meat	● ● ◐	● ◐	● ◐	● ◐	● ●	● ●
		Steak	● ● ◐	● ◐	● ◐	● ◐	● ●	● ●
		Burger	● ● ◐	● ◐	● ◐	● ◐	● ●	● ●
	Dried fruit	Packed	● ◐	◐ ◐	◐	◐	◐	
		Bulk	● ● ◐	● ◐ ◐	● ◐	● ◐	● ◐	
Complex**	Meat	Chicken fillet	●	●	●	●	●	●
		Sausages in bag	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
		Overlapping burger	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
		Sausages in bulk	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
	Cereal	Packed	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
		Bulk	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
	Vegetables	Green bean	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
		Broccoli	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
		French fries	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
	Dried fruit	Packed	● ●	● ◐	● ◐	● ◐	● ◐	● ◐
		Bulk	● ●	● ◐	● ◐	● ◐	● ◐	● ◐

Key to foreign body detection:

● **G2** ● **GN** ● **EN**

● **Optimum solution** ◐ **Solution allowed**

* A group of products that are standardized or identical.

** Products which include different thickness, overlapping etc.