

Technical Note

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X-ray Inspection System Bulk Product Inspection

Bulk product inspection by x-ray inspection systems are always receiving significant attention in exhibitions. How is this system different from others? What products are ideal for the inspection? Let us explain the outline and look at the possibilities.



[1] What does "Bulk Product Inspection" mean ?

Usually, when it comes to "contaminant" detection, you may think of products arranged in a production line for being inspected (Fig.1).

On the other hand, "bulk product inspection" means that products are randomly fed into an inspection line (Fig.2). To be more specific, products are "being spread", "facing different directions", and "unevenly spaced" during the inspection.

It is applied in various production lines such as beans, raw meat and dried vegetables.

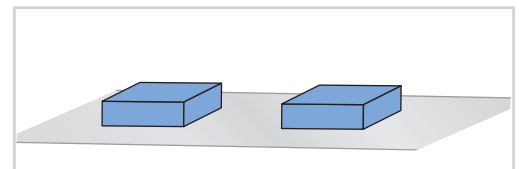


Fig.1 Boxed or packaged product inspection

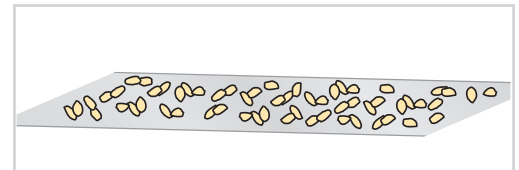


Fig.2 Bulk product inspection

[2] What is the difference of the x-ray inspection system for bulk products?

The x-ray inspection system for bulk products has quite a different structure from a standard unit. Since x-rays affect the human body, preventive mechanisms are required. Therefore, an "x-ray leakage prevention curtain" is mounted at the entry and exit points of standard x-ray inspection systems.



Pic.1 Standard x-ray inspection system
(Example: KD7405AWH)



Pic.2 X-ray inspection system for bulk product inspection
(Example: KD7405ABWH)

However, "small" and "light-weight" products, which are the main targets of bulk flow, often become jammed by x-ray leakage prevention curtains. This may cause line stops and alarms.

Above all, the Japan food law bans the usage of lead in the x-ray leakage protection curtains when inspecting unpacked food products since lead is harmful for the human body.

Due to this, the inspection system for bulk products (Pic.2) adopts extended "X-ray leakage prevention covers" and "Shield plates" instead (Fig.4).

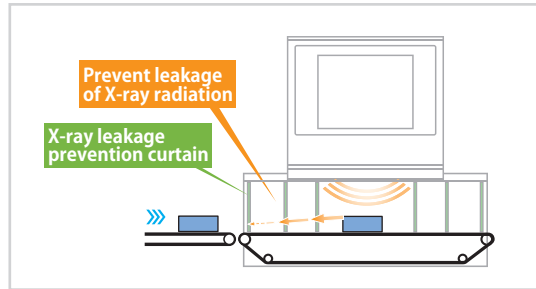


Fig.3 Standard x-ray inspection system

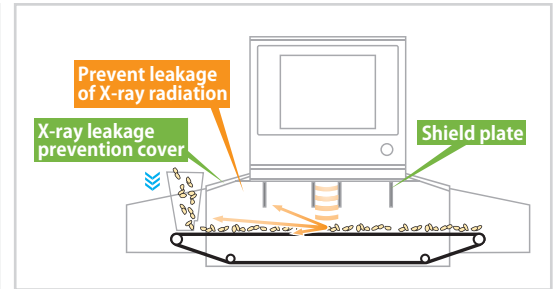


Fig.4 X-ray inspection system for bulk product inspection

【3】 What are the advantages of "Bulk product inspection" ?

Did you notice in 【1】 , that the common point is raw materials and unpacked products? There are two major benefits by adopting the bulk product inspection.

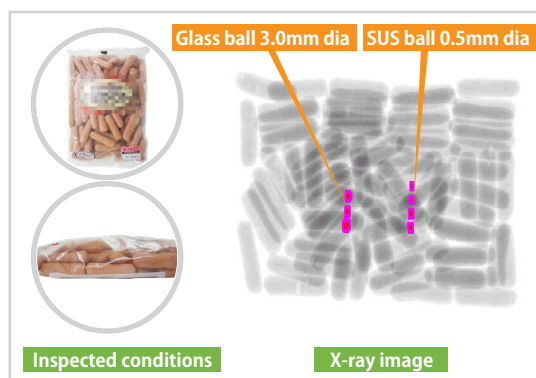
- (1) Enhanced sensitivity
- (2) Lowered production costs

Although it depends on the product physical properties, contaminants are more detectable in thinner products. In most products, detection sensitivity is higher in unpackaged, loose conditions than in boxed or packaged conditions, because products are thinner in the former condition.

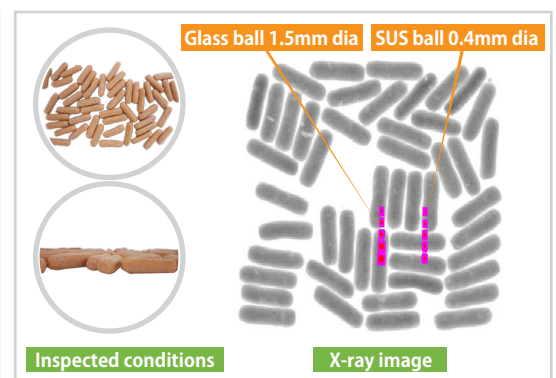
Moreover, contaminant may become less detectable downstream due to the grinding or heat treating process. These steps break contaminants into smaller pieces or change its shapes and size. For this reason, inspections are more effective during the early stages.

Furthermore, the more products are rejected, the more processing and packaging cost are wasted if inspected only at the final check point. Even the "contaminants" may damage processing equipment.

We hope the above explanation helps you better understand the benefits of bulk flow inspection when performed early in the process, not just after processing and packaging.



Pic.3 Boxed or packaged conditions



Pic.4 Unpackaged conditions

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