

To help you use Anritsu's Metal Detectors correctly.

We'll answer your questions.



Anritsu Industrial Solutions is your Best Partner in providing Best Solutions.

First

Daily inspection is very important.

Securing guaranteed detection sensitivity and accurate rejection!

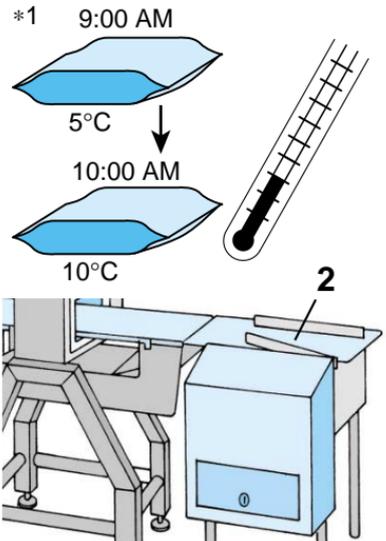
Check the operation at the start of the work day, when changing products and at regular periods.

1. Checking sensitivity

Sensitivity varies with the product temperature*¹ and materials, and the ambient temperature.

2. Checking rejector operation

Check that contaminated products are rejected correctly by the rejector.

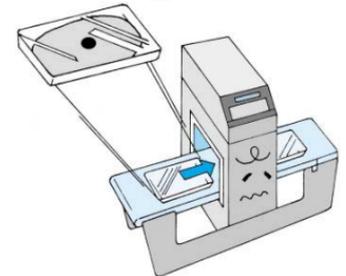


Check under the most difficult detection conditions.

- Attach the most difficult to detect metal contaminant to a test product and check the rejection.
(Usually, check the rejection operation by using the Fe or SUS testpiece.)



- Attach the testpiece to the most difficult to detect position of the product and check the rejection.
(The head center is the most difficult to detect position.)

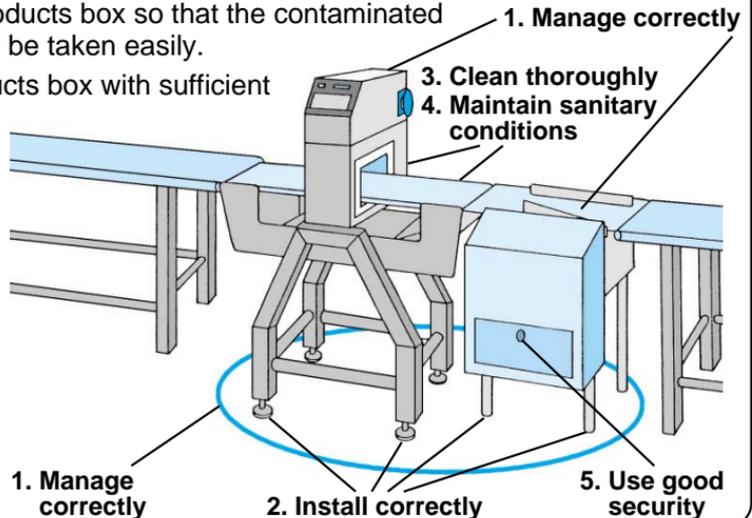


- Sometimes a metal contaminant cannot be detected depending on the shape and orientation of the contaminant.
(Remember that not all metals can be detected!)



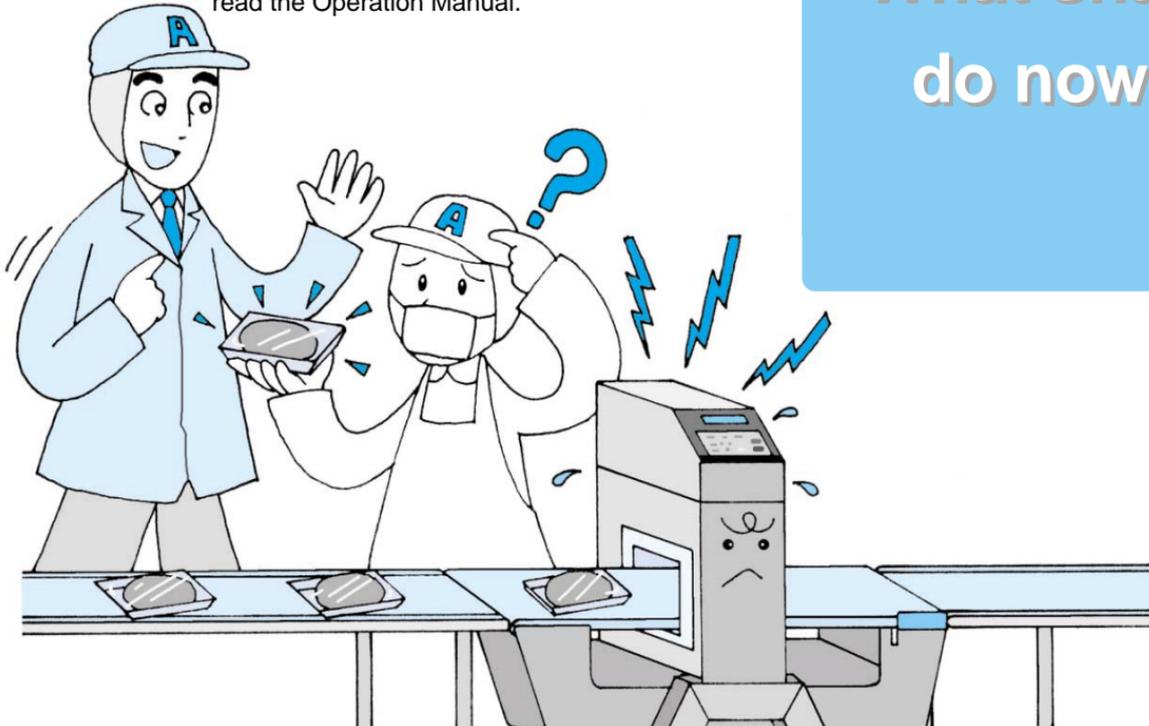
Five Basics of Quality Control

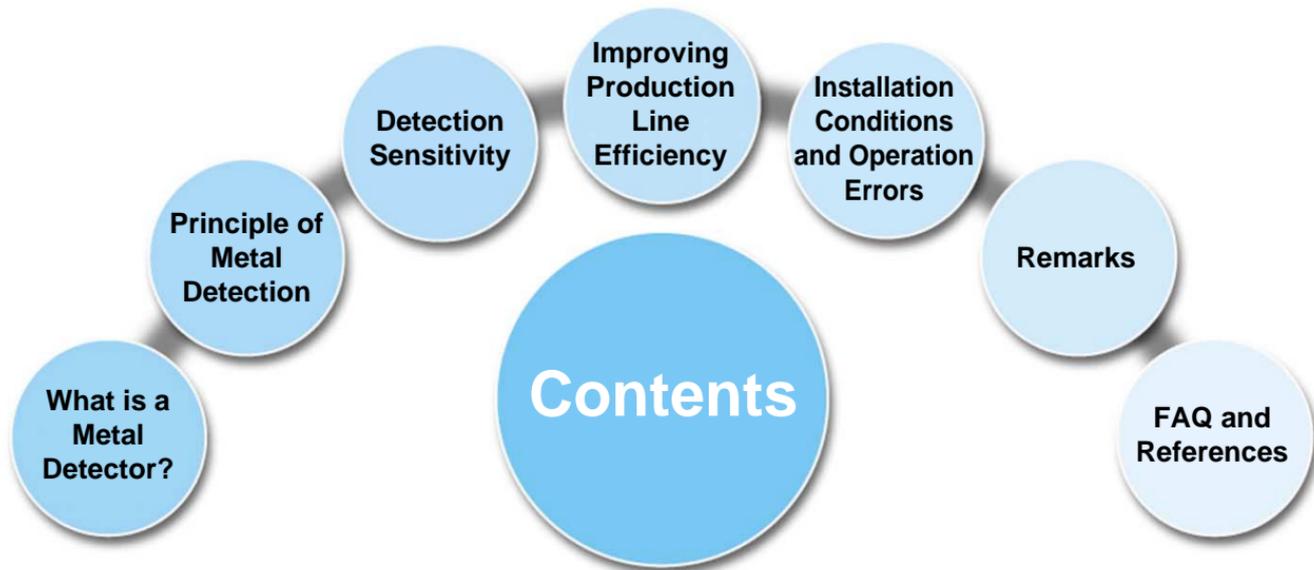
- 1. Manage correctly** Do not allow inappropriate items to be placed on or near the metal detector.
- 2. Install correctly** Install the metal detector and rejector correctly so the upstream and downstream conveyors are not touching them.
- 3. Clean thoroughly**
- 4. Maintain sanitary conditions** } To prevent lowered detection sensitivity, clean the conveyor belt and detection head thoroughly each day. Adjust the belt regularly so that there is no mistracking or fraying.
- 5. Use good security** Manage products to prevent mixing of contaminated and uncontaminated products.
 - Lock the NG products box so that the contaminated products cannot be taken easily.
 - Use a NG products box with sufficient capacity.



This guide only provides a brief explanation of the metal detector and its operation. For more detailed explanation of the operation procedures, read the Operation Manual.

What shall I do now?





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What is a Metal Detector?

Uses and Applications

A metal detector has an important role in the following applications.

Product Quality Control

- Social responsibility—Ensuring consumer safety by preventing contaminated food reaching customers
- Product confidence—Maintaining brand reliability image

Supporting Product Liability Law

- These laws and regulations guard public health and safety by compelling manufacturers to accept responsibility for the safety of their manufactured products.

Yes—a good partner in ensuring product quality!



Production Process Control

- Rejecting contaminated products as early as possible ensures high production efficiency.
- Metal detection guards against damage to production machinery caused by contaminants.

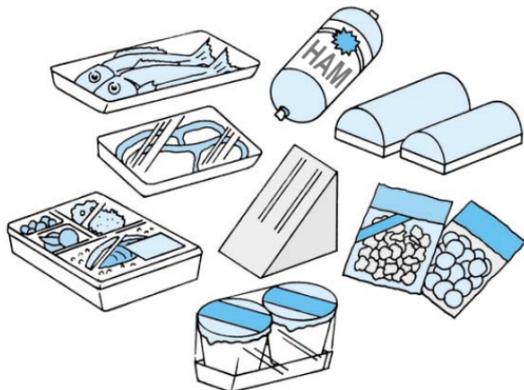
HACCP Compatibility

- This standard sets the rules for inspecting foodstuffs at every stage from production of raw materials until the final products reach consumers to ensure that they are safe, healthy and of sufficiently good quality.

Uses and Applications

Metal detectors play an essential role in contaminant detection in a huge number of fields.

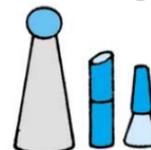
in food processing lines



in pharmaceutical manufacturing



in cosmetics manufacturing



in garment production lines

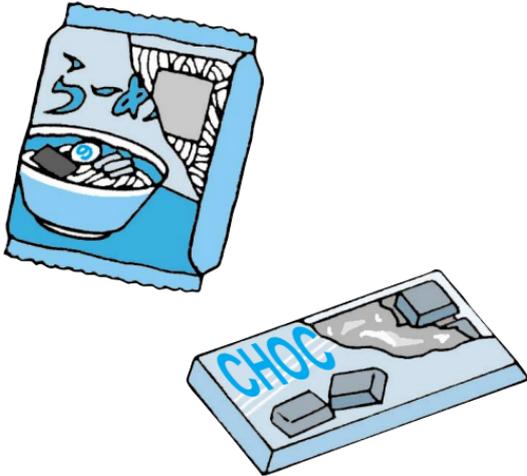


Uses and Applications

The special features of metal detectors make them useful in other applications too.

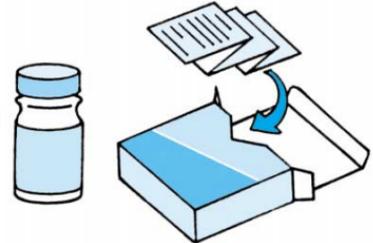
- **Detecting missing soup packet, etc., in instant noodles**
Checking aluminum-foil seals on snacks

Missing components of packaged foods such as foil-packed liquid soup stock or seasonings in instant noodles can be checked. The presence of important metal seals such as clips on sausages can be confirmed.



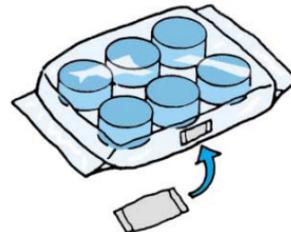
- **Detecting missing caps and documentation in pharmaceutical products**

The presence of a metal cap or seal and important documentation printed with magnetic ink can be checked.

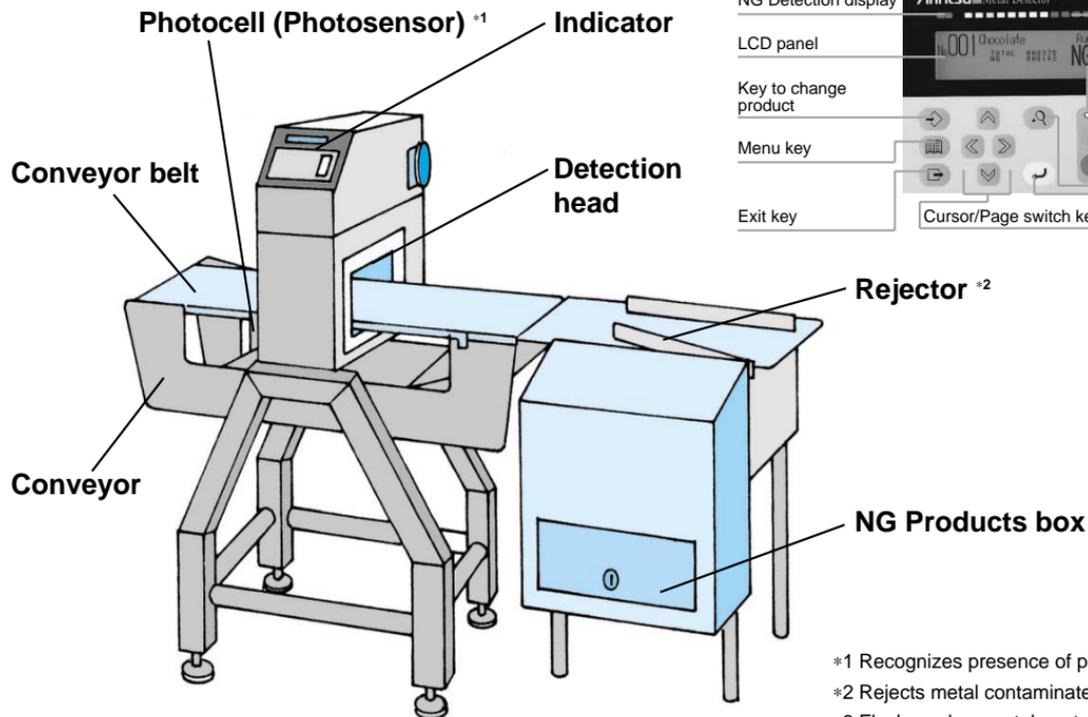


- **Detecting presence of packed antioxidants**

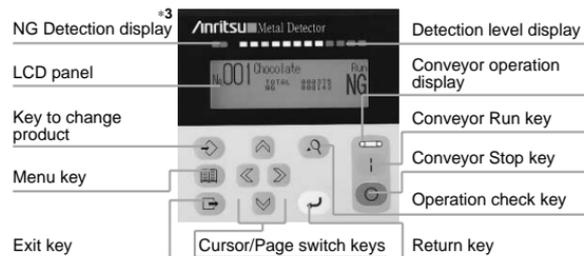
The presence of metallic antioxidant packs in pre-packaged foods can be checked.



Names of Parts



<Example of KD80XX Series Operation Panel>



*1 Recognizes presence of product

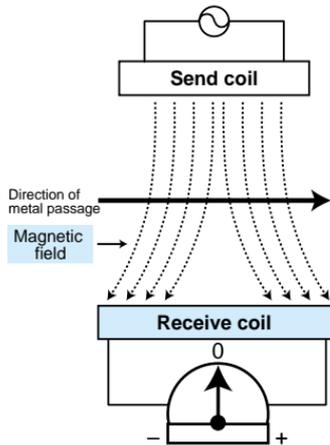
*2 Rejects metal contaminated products

*3 Flashes when metal-contaminated product detected

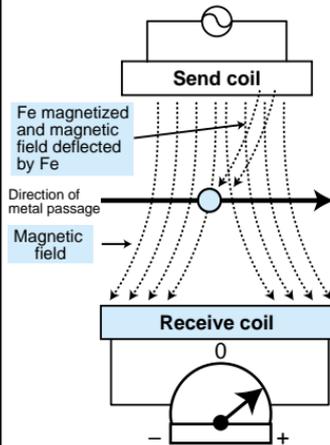
Principle of Metal Detection

Principle of Metal Detection

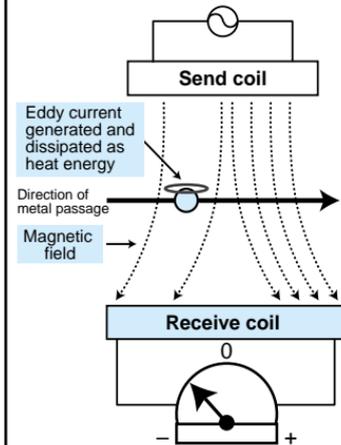
Normal condition



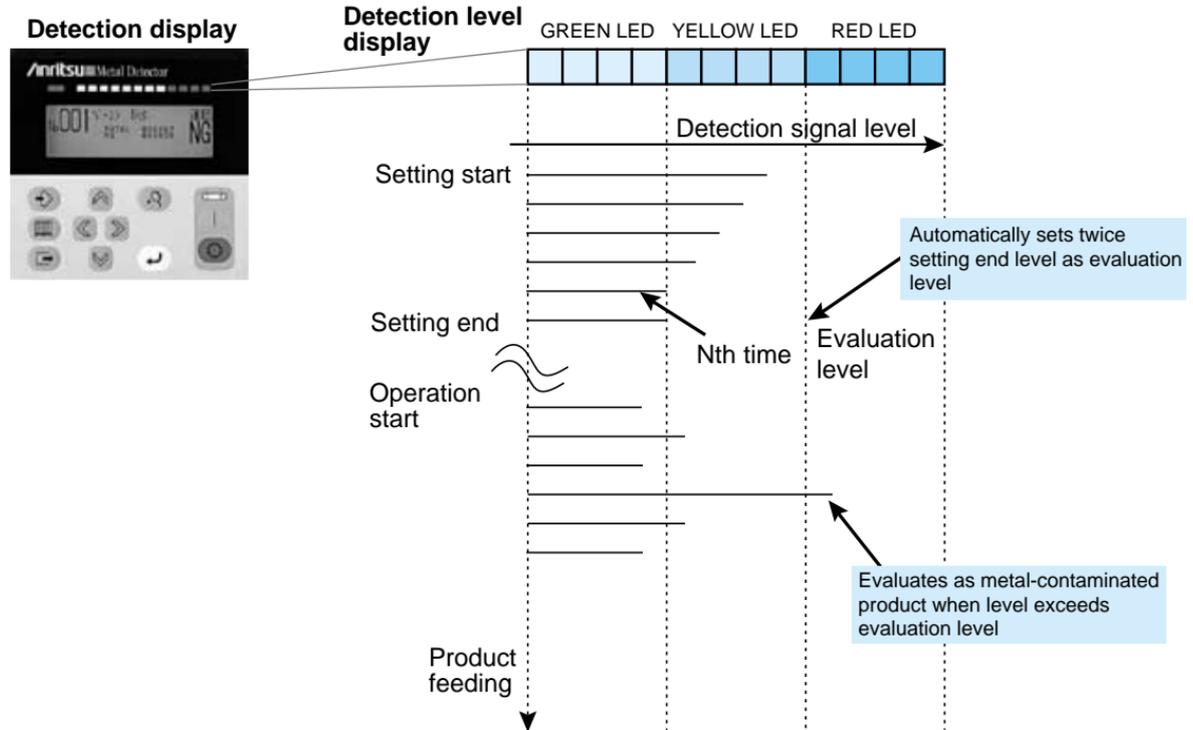
When Fe (magnetic metal) passed through detector



When non-magnetic metal passed through detector



Contaminant Detection

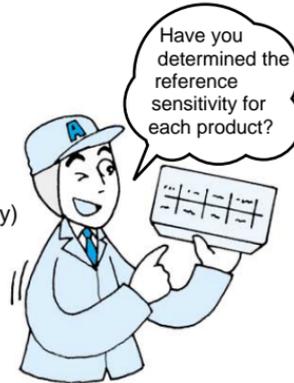


It is important to set the sensitivity for each product!

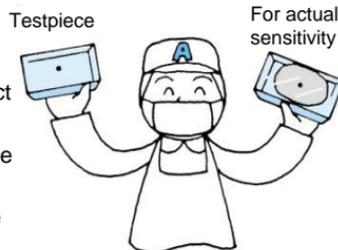
HACCP Requirements

(administration principles)

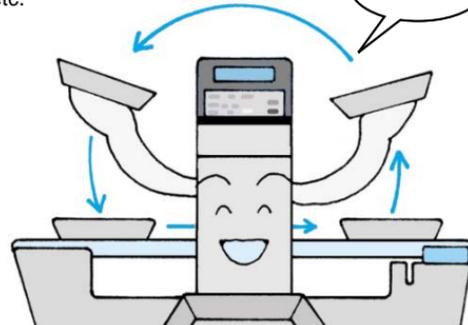
- Administration level for products
- Registration (equipment list, designated administrator, inspection registration, fault history)
- Complete training plan
- Testpiece management



- The sensitivity of the testpiece described in the catalog (highest detection sensitivity) is different from the sensitivity at actual product detection (actual sensitivity). The testpiece sensitivity given in the catalog is the sensitivity when only the testpiece is passed through the metal detector.



- The sensitivity is adjusted at the Auto-setting screen just by passing the product through the metal detector several times. After attaching the testpiece to the product, check the sensitivity.
- The sensitivity should be adjusted according to the actual conditions (product temperature, ambient temperature, installation location) on the production line.
- Be sure to remove any metal rings, jewelry, wristwatches, etc.

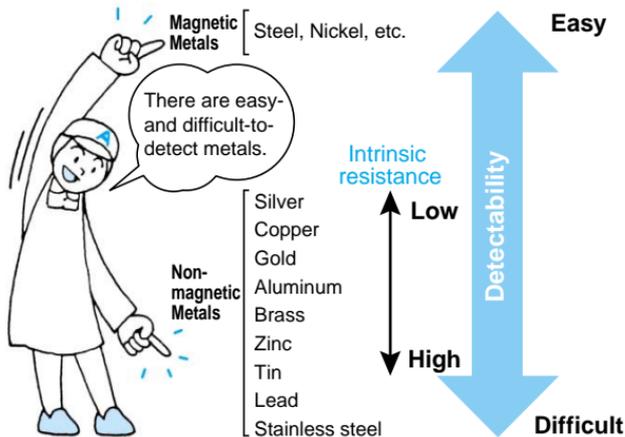


Easy- and Difficult-to-Detect Metal Contaminants

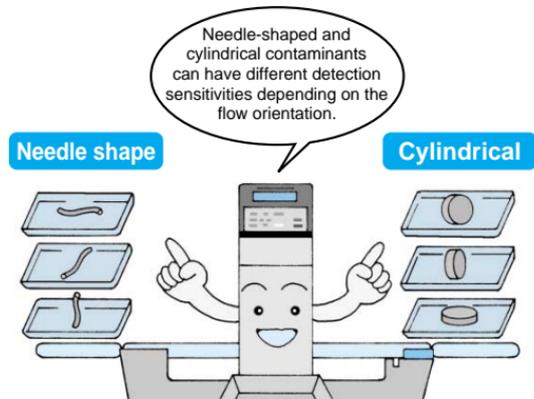
Easy- and Difficult-to-Detect Metal Contaminants

- Non-magnetic metals like stainless steel (SUS) with a high intrinsic resistance are difficult to detect.

Detection Sensitivity of Different Metals



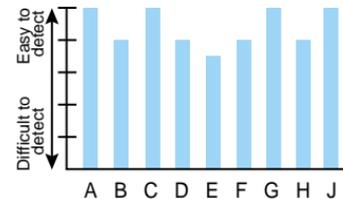
Sometimes metal contaminants cannot be detected depending on their shape and orientation.



Change in Detection Sensitivity with Position at Passage through Head

exe.

G	H	J
D	E	F
A	B	C

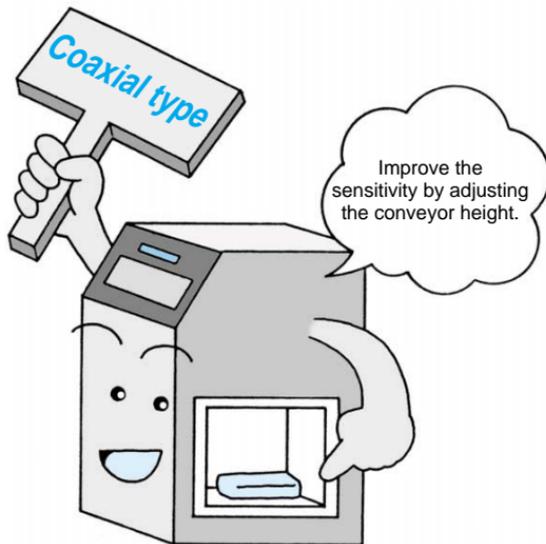


* Side View of Coaxial Type Detection Head

How to Improve Sensitivity

These few small points can help improve detection sensitivity.

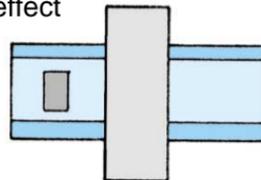
- The detection sensitivity is improved by adjusting the conveyor height so that wet products with a large effect, such as miso and pickles, pass through the center of the detection head opening.



Effect of feeding orientation

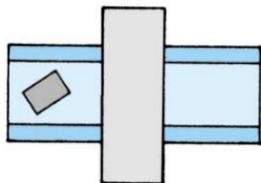
- Detecting small contaminants in products with a small effect

Large effect

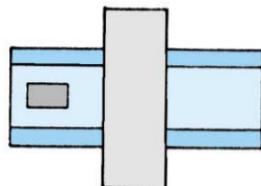


Slightly oblique is best.

Small effect



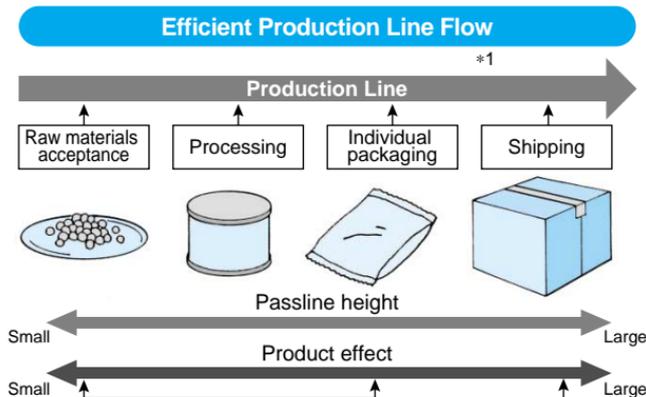
Medium effect



Improving Production Line Efficiency

Effective Operation Methods

Setting Up Line with Even Higher Sensitivity Detection



Usage example

Metal detector 1

- High-sensitivity detection
- Install downstream of freezer
- Install upstream of aluminum packager



Metal detector 2

- Unsuitable for high-sensitivity detection
- For checking contamination with foreign materials from machinery, such as nuts, bolts, etc.
- For checking metal contamination by carton itself.



*1 The metal detector is best positioned at the last stage before delivery of the product to the consumer.

Choice of Two Types to Match Application

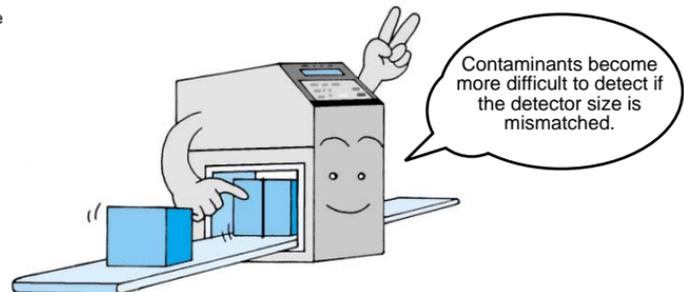
1. Dry Products, Wet Products and Aluminum Evaporated Packages

Dry products like noodles, candies, and clothing
Wet products like meat, pickles, pastes, and fish
Aluminum-evaporated package products like frozen foods and snacks

2. Aluminum-foil package product

Aluminum-packaged Retort foods and desserts

- The metal detector passline height must match the product height.

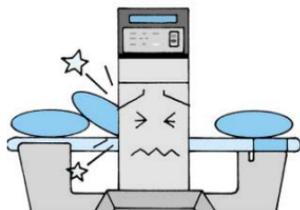
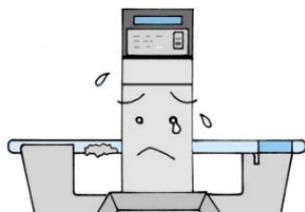


Installation Conditions and Operation Errors

Causes of Operation Errors

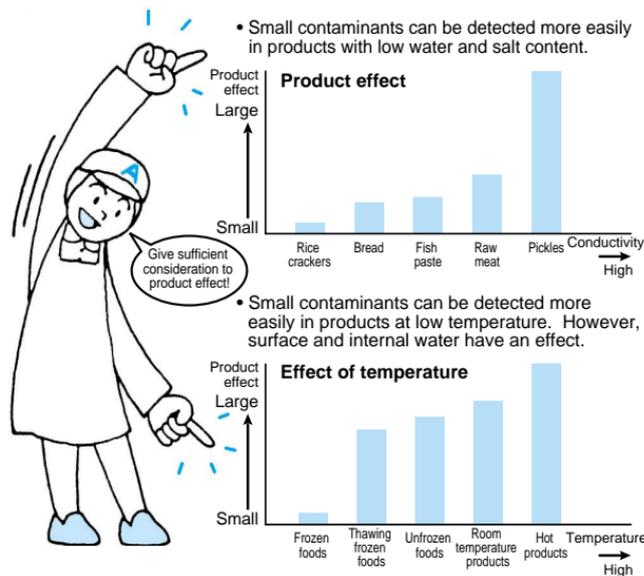
To assure correct operation:

- Recheck the installation environment.
- Check that there is no rusting on the belt surfaces.
- Check that the product spacing, orientation and location are constant.
- Check that there are no sudden changes in product and room temperature.
- Check that there are no changes in the components of each production lot.



Changes in detection sensitivity with product components

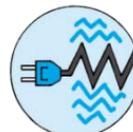
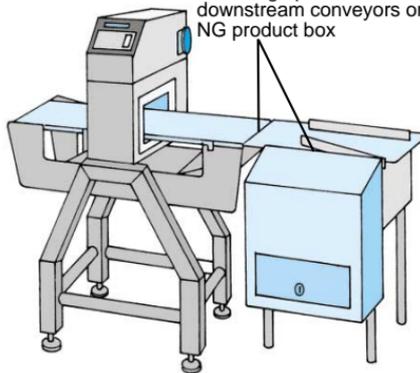
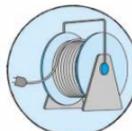
- Changes in the product water and salt content, weight and thickness change the detection sensitivity.



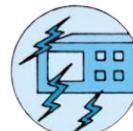
Installation Conditions and Usage

Note the following to prevent operation errors:

- Do not install metal detectors near a vibration source.
- Do not share the power outlet with another machine and do not use power strips, etc.
- Do not supply the power via a power cord wound on a drum.
- Check that the feet locknuts are tight to prevent vibration.
- Leave 2 to 5 meters between adjacent metal detectors to prevent electromagnetic interference. If this is not possible, consult Anritsu Industrial Solutions.



- Oversensitive
- Touching upstream or downstream conveyors or NG product box

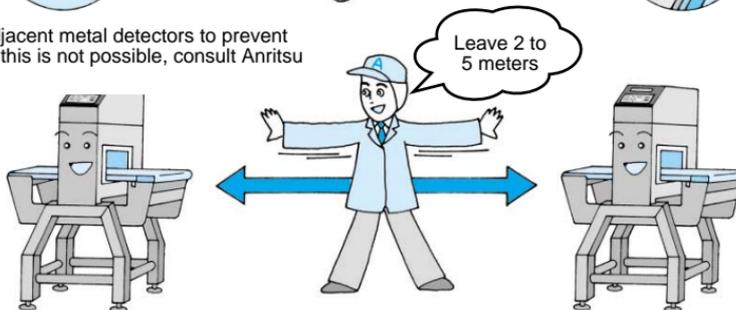


- Noise in power line (voltage fluctuation or momentary power loss)

- Electronic equipment close to detection head. Do not put electronic equipment on metal detectors.

- EMI radiated by nearby equipment (especially inverters) or conducted through power line

- Effect of nearby moving metal machinery (rollers and packagers)

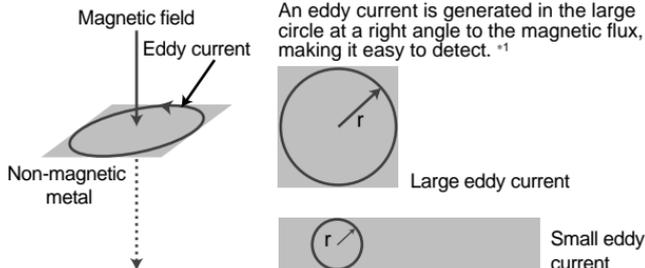


Remarks

Differences between Magnetic and Non-magnetic Metals

Simple detection principles

Shape of non-magnetic materials and detection sensitivity



Detection Sensitivity Characteristics of Magnetic and Non-magnetic Metals

Magnetic Metals

1. Proportional to volume
2. High sensitivity magnetic directivity
3. Sensitivity to fine powder similar to large lumps
4. Unaffected by send frequency
5. Inversely proportional to square of distance between send and receive coils

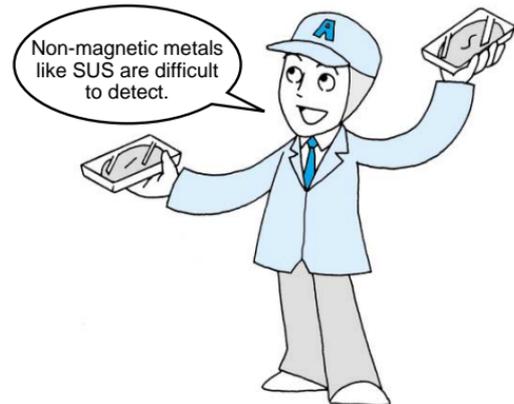
Non-magnetic Metals

1. Inversely proportional to intrinsic resistance of metal
2. Proportional to maximum radius (area) at right angle to magnetic flux
3. Sensitive only to largest particles of fine powder
4. Proportional to square of send coil frequency
5. Inversely proportional to square of distance between send and receive coils

Intrinsic Resistance of Non-magnetic Metals and Detection Sensitivity

Silver	1.62	$\mu\Omega \cdot \text{cm}$	Intrinsic resistance ↓	↑ Detection Sensitivity	High
Copper	1.72				
Gold	2.4				
Aluminum	2.75				
Brass	5~7				
Zinc	6.1				
Tin	11.4				
Lead	21				
Stainless steel	55~				Low

*1 Needle-shaped contaminants in stainless steel, etc., have a small eddy current and are difficult to detect.



Construction of Detector Head

Construction of Detector Head



Coaxial type

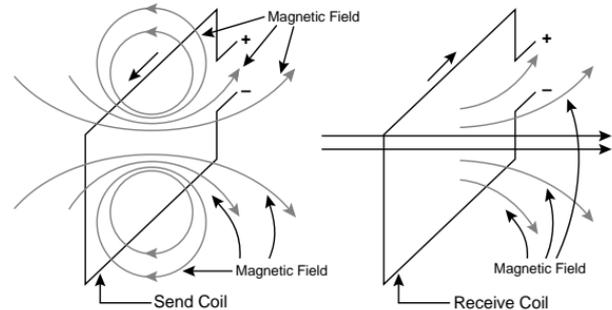


Opposing type



Permanent magnet type

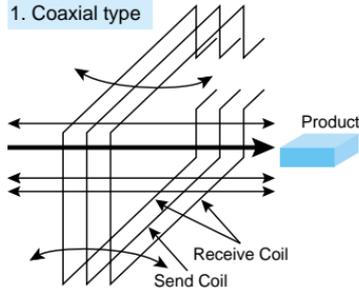
Relationship between Coil and Magnetic Field



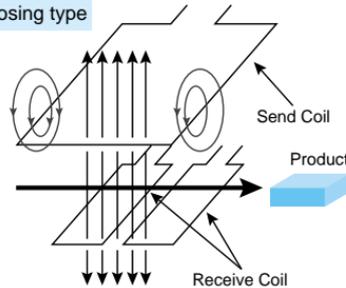
A magnetic field is generated when a current flows in the send coil.

A current is generated in the receive coil when it is in a magnetic field.

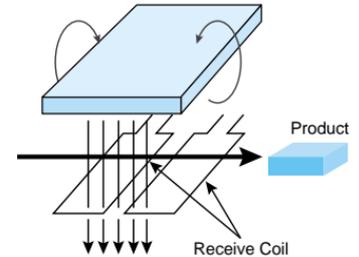
1. Coaxial type



2. Opposing type



3. Permanent magnet type



FAQ and References



- **Q1** How can we best determine the basic sensitivity?22
- **Q2** Can you explain the classification of wet and dry products?
- **Q3** How can we best avoid operation errors caused by floor vibration?
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- **Q18** Can the metal detector detect non-metallic contaminants?27
- **Reference**28

Q1.

How can we best determine the basic sensitivity?

A1.

- Check the sensitivity by detecting an Fe and SUS testpiece attached to the product. When the product effect is large, it is necessary to measure the basic sensitivity that takes the product temperature and shape randomness into consideration as well as low basic sensitivity.
- Register the basic sensitivity as shown in the Basic Sensitivity Management Table at the end of this booklet (page 29).

Q2.

Can you explain the classification of wet and dry products?

A2.

- There is no clear division point but water content is a practical method.
Dry products are items like snacks foods, candies, wheat flour, and completely frozen items.
Wet products are items like vegetables, ham, sausage, pickles and raw meats.

Q3.

How can we best avoid operation errors caused by floor vibration?

A3.

- It is best to install metal detectors in locations with no floor vibration but if this is not possible, use the metal detector with lower basic sensitivity.

Q4.

How can we prevent mis-detection of metal contaminants?

A4.

- You can reduce the misdetection rate by managing the basic sensitivity for each product and by performing careful operation checks at the daily inspection.



Q5.

At shipping inspection we get OK but then at acceptance inspection we get NG!

A5.

- The basic reason is the difference in detection sensitivity with a larger detection head. The shipper often performs inspection with a large detection head while the buyer splits the delivered product into smaller parts and inspects with a smaller detection head. It is very important to use a metal detector with the smallest possible entrance (opening) matching the size of the product.



Q6.

We want to be able to detect lead shot, bullets, and hypodermic needles in lumps of meat!

A6.

- A block of meat is very wide and thick and detection may not be possible even with a large detection head. In this case, to detect small metal contaminants, it would be best to cut the meat into smaller pieces and then perform detection with a smaller head.



Q7.

We want to be able to detect pieces of metal brushes and metal mesh!

A7.

- It can be very difficult to detect needle like metal contaminants from metal brushes and metal mesh. Even if the pieces are long, if they are very small diameter, they may not be detected (see page 14).



Q8.

Why does detection sensitivity change with temperature in frozen products?

A8.

- Compared to a perfectly frozen product, the effect of water and salt content on detection sensitivity is larger in thawing or defrosted products, so the detection sensitivity is lower.



Q9.

Can you detect burned and rusted metals?

A9.

- Yes. However, the detection sensitivity varies according to the shape and orientation of the contaminant. In addition, very small particles may not be detected.



Q10.

Why does the bar graph display continue to move even when products are not being fed through the detector?

A10.

- A metal detector detects metal contaminants by detecting very small changes in the magnetic field. Consequently, if there are moving metal objects or machinery that generates a strong magnetic field nearby, they may cause changes in the magnetic field and be detected. In addition, a dirty conveyor belt can also cause field fluctuations.

Q11.

Can operators wear rings and wristwatches, etc., while working?

A11.

- Metal rings and wristwatches, etc., can have an effect on magnetic fields and be detected by a metal detector. Operators should remove rings and wristwatches before starting work.



Q12.

Can products in transparent bottles be detected?

A12.

- In the case of completely transparent bottles, the photocell may miss the product. In this case, consult Anritsu Industrial Solutions for possible solutions.

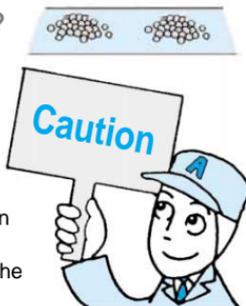


Q13.

What cautions should be noted when feeding bulk products?

A13.

- When a rejector is connected, it is necessary to set a sufficient rejector hold time (rejector operation time).
- When the metal detector operation is set to stop at metal detection, remove all the bulk product from the conveyor belt before restarting.

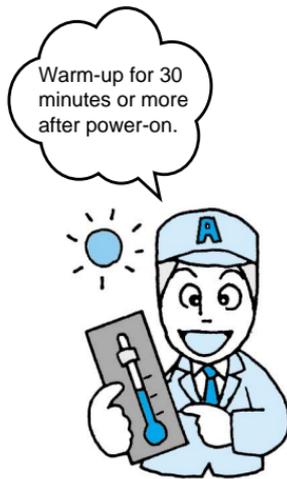


Q14.

What is the warm-up time after power-on?

A14.

- To ensure accurate detection, the metal detector should be allowed to warm-up for 30 minutes or more after power-on. The metal detector should be reset when the room temperature changes markedly, especially in the morning.



Q15.

What precautions are needed at cleaning?

A15.

- Any dirt and product particles must be cleaned off frequently from the detector head opening and conveyor belt gaps using a neutral detergent and a soft plastic brush and cloth. Do not use thinners, toluene or metal brushes, etc. In addition, clean the main unit with hot water at less than 40 degrees Centigrade (in accordance with waterproofing specifications).



Soft plastic brush



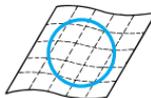
Metal brush



Neutral detergent



40°C max.



Soft cloth

Q16.

We want to keep a record of the detection operation.

A16.

- Use the optional printer.



Printing Example

***** Operation History *****			***** NG History *****		
PRINT	1999/06/26	08:30	PRINT	1999/06/26	08:30
HETCOLFAMD	1999/06/24	08:30:00	NG Y0.1.0.2.0	X1.0.0.0.0	NG001
START	1999/06/24	08:30:30	NG Y1.0.0.2.0	X1.0.0.0.0	NG001
ADCS NG imp	1999/06/24	11:11:50	NG Y0.0.0.2.0	X1.0.0.0.0	NG001
SNDCHE_V1	1999/06/24	14:30:59	NG Y1.0.0.2.0	X1.0.0.0.0	NG001
SNDCHE_V1	1999/06/24	15:33:44	NG Y1.0.0.2.0	X1.0.0.0.0	NG001
SNDCHE_V1	1999/06/24	15:34:17	NG Y1.0.0.2.0	X1.0.0.0.0	NG001
STATUS	1999/06/24	16:35:44			
ATSET		0.0			
	1999/06/24	17:33:44			
AD1 DOUBLE-PRODUCT ALARM					
STOP					

Q17.

We want to install a metal detector and checkweigher but the space is too small.

A17.

- Anritsu Industrial Solutions also has spacesaving checkweigher models with an integrated metal detector.



IP Series Checkweigher
with Metal Detector

Q18.

Can the metal detector detect non-metallic contaminants?

A18.

- No. To detect non-metallic contaminants like bone, shell, stones, glass, etc., you should use Anritsu's X-ray Inspection System.

Features

- High-sensitivity detection
Detects metals, bone, shell, stones, glass, etc., at high sensitivity
- Compact size at just 800-mm long
Can be installed simply without changing existing line structure
- Safe for operators and products
Low-energy X-rays and leakage countermeasures guarantee absolutely safe operation
- Excellent waterproofing standards and HACCP compatible
All SUS external construction and conveyor part supporting IP66 standard
One touch removal and fitting of conveyor belt
- Simple operation at large (10.4") color touch panel



X-ray Inspection System
KD7203AW



Metal Detector Daily Inspection Record

Production Line No. _____

Manager _____

Date and Time	Product No./Name	Basic Sensitivity Check	Daily Inspection	Checked by
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	
/ / :		<input type="checkbox"/> Fe <input type="checkbox"/> SUS <input type="checkbox"/> Others	<input type="checkbox"/> Rejector operation <input type="checkbox"/> Cleaning <input type="checkbox"/> Belt wander/slip <input type="checkbox"/> Others	

Metal Detector Basic Sensitivity Management Table

Production Line No. _____

Manager _____

Prod No.	Product Name	Product Type (only for KD80X Series)	Basic Sensitivity			Remarks
			Fe (mm)	SUS (mm)	Others	
01		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
02		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
03		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
04		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
05		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
06		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
07		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
08		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
09		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
10		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
11		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
12		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
13		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
14		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		
15		<input type="checkbox"/> Dry products <input type="checkbox"/> Wet products <input type="checkbox"/> Aluminum evaporated film packaged products <input type="checkbox"/> Others	φ	φ		

Metal Detector Check sheet

Production Line		Inspection Date	/ /	Inspection Result	OK	✓	Repair	△
Model		Serial No.			Exchange	×	Clean	C
					Need to exchange	L	Adjust	A

Inspection Item	No.	Inspection Contents	Inspection Frequency	Result
Installation	1	All screws tight on each part No missing screws, damage or deformation to external parts	6 months	
	2	All connectors to Indicator and detection head connected tightly	6 months	
	3	No vibration in detector main unit All locknuts on feet tight	6 months	
	4	Passline secure and no other parts touching	6 months	
Product Characteristics	5	No change in product characteristics (product character, product temperature, size, packaging)	Every day	
	6	Product matches set Prod No.	Every day	
Conveyor Parts	7	Conveyor and drive belt tension correct and no belt slip	Every day	
	8	No conveyor belt mistracking, damage or slippage	Every day	
	9	No abnormal noise from rollers and motors	Every day	
Photocell	10	Photocell surfaces clean	6 months	
	11	No misalignment in photocell axis and accurate product detection	6 months	
	12	No double recognition of single products	6 months	

Inspection Item	No.	Inspection Contents	Inspection Frequency	Result
Indicator	13	Each key operates correctly	6 months	
	14	No error displays	Any time	
	15	No tripped fuses and breakers and no abnormalities	Any time	
Detector head	16	No abnormalities in rubber packings and mounting bolts	6 months	
Operating environment	17	No effect from external noise, interference and moving metal objects	Any time	
	18	Correct and stable power supply voltage	6 months	
	19	No operation errors due to vibration and mechanical shock	Any time	
Rejector operation	20	Normal rejector operation	Any time	
	21	Correct rejector operation timing	6 months	
Detector characteristics	22	No detection of uncontaminated products Accurate detection of product with testpiece	Every day	
	23	No error when running conveyor belt with no products Clean conveyor belt	Any time	
	24	Products fed at consistent interval and orientation on conveyor belt	Any time	

Note:

Inspector

Glossary

The main terms used in this brochure are explained below:

Magnet	A mineral with magnetic properties having north and south poles
Magnetic Force	Force between the north and south poles of a magnet. Like poles repel while opposite poles attract
Lines of magnetic force	The lines of magnetic force around the poles of a magnet
Magnetic field	The force field generated around a magnet or current
Magnetism	The quality possessed by magnetic materials or the quality induced in a magnetic field
Testpiece	A test material used for evaluation (a spherical metal object for testing metal detection by a metal detector) Uses a sphere to evaluate without effect of shape and orientation Either strongly magnetic metal like Fe, or non-magnetic metal like SUS
Coil	When current passed through winding on metal core, generates magnetic field in concentric circles around winding
Detection sensitivity	The minimum diameter (mm) of a metallic object that can be reliably detected by a metal detector Both Fe and SUS have specific detection sensitivities (SUS = 0.5) The detection sensitivity can be specified as either the sensitivity when a testpiece is attached to the product or when only the testpiece is passed through the detector. In the former case, the value varies each time a test product is inspected. In the latter, the value is constant and depends only on the metal detector.



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