



# Story of Myrecognition&Awareness

WP 400

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## Foreign material identification within the food chain

### *Introduction*

During the processing along the food chain several kind of contamination can occur and cause a damage of equipments or hazard related to the production of food. Within food products contamination is a common problem for manufacturers. When reviewing the food chain, - from 'farm to fork' – there are several opportunities for contamination during the processes.

The presence of foreign materials is a contamination which can come from the harvesting, fall from equipments and can be caused by contraventions of the staff hygiene and instructions for hygiene. Foreign material can be: metal, glass, plastic, wood, stone, textile, rodent, insect, etc.

The detection of foreign materials is a critical control point within the food chain in many cases. It is relevant for food safety to avoid any type of contamination and any type of foreign material.

### *How do detectors work?*

Detectors can visualise the contamination on/in the products during the processes.

The identification and separation of foreign material have many types of technical devices in the practice. The types of detectors:

- Easy methods:
  - Electro/permanent magnet
  - Air selection
  - Liquid separator
  - Sieves, filters
- Instrumental methods
  - Colour grading
  - Metal detector
  - X-ray
- Hand sorting

These equipments work in the same way. They have sensors, a transfer system (e.g. conveyor) and a separator system.

Discriminating apparatus, gravity separator, and electrostatic separator are the types of devices which can be used for paper and plastic identification and separation. Usually in practice the most widely used detector is the metal detector. It produces a magnetic field, and when a metal or a metallic object passes over the metal detector, the object creates another magnetic field around itself. The magnetic field interferes with the radio waves and causes a change in the tones produced by the receiver. Hence, the metal detector lights/ beeps up.

The most effective way of foreign material identification is using of x-ray. All kind of materials has different characteristic relay, hence the material of the object can be identified. X ray can identify the consistency, figure, position and the number of foreign materials in the product during the processes.

### *How does detection work with Future Internet?*

A 'Cloud' also could be used for foreign material identification. Since machine to machine communication works, the 'Cloud' can communicate with the detectors, exchange, send and re-

ceive data, so data obtained by the detector(s) can be directly compared with the database of foreign materials which are already detected/known. This system can collect the information about all kind of identified foreign material from all industries over the World. The wide spectrum identification decreases the risk of the presence of foreign material in food safety.

When a detector find an object which can't be identified it communicates with the 'Cloud', with sending the characteristic and the picture of the foreign material. The 'Cloud' identifies the material and if the material hasn't appeared before in any system, the data about the unidentified object is automatically stored in the 'Cloud' database. Thus the 'Cloud' works as a database which always updates itself.