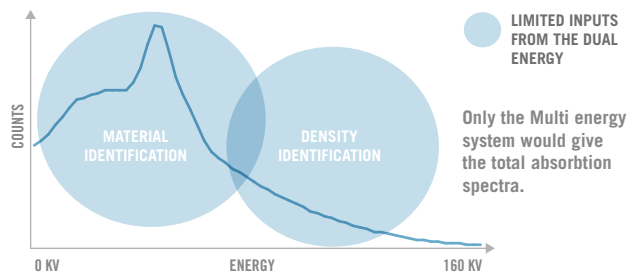# The next step
in process efficiency

X-RAY MULTI ENERGY SPECTROMETRY

▶ Current X-Ray sensing technologies utilize single or dual energy data acquisition systems. Single energy systems cannot provide any material discrimination information and dual energy systems can only provide a very basic distinction between organic materials, inorganic materials and metals.

▶ Multi energy spectrometric data acquisition systems allow for much improved material discrimination and can produce qualitative results about elemental composition of the material or materials screened. This method enables elements or combination of elements from the entire periodic table to be analyzed.

▶ Adapting an advanced technology used in security domain, MultiX is offering an integrated ME100 system for the food industry.

X-RAY SPECTRUM

Each material has a unique X-Ray absorption signature.

Multi energy spectrometry introduces new features that can be used to increase the ability of a system to discriminate between similar materials such as those found in food stuffs.

LIMITED INPUTS FROM THE DUAL ENERGY

Only the Multi energy system would give the total absorbtion spectra.

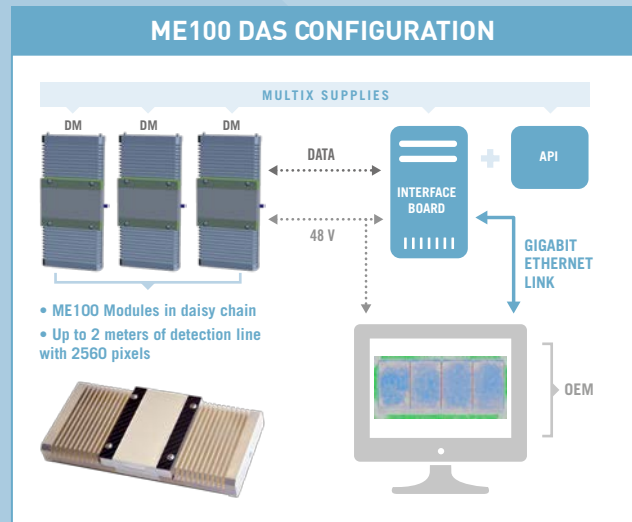| CONVENTIONAL SINGLE ENERGY	CONVENTIONAL DUAL ENERGY	MULTIX MULTI ENERGY
SCINTILLATOR	SCINTILLATORS	CdTe DETECTOR
One averaged energy data	Two averaged energy data	256 energy data
X-Ray photon integration	X-Ray photon integration	Photons counting and energy measurement
Attenuation gray levels and contrast	Very rough high/low energy filtering	256 Energy Bands
Poor discrimination	Limited discrimination	High discrimination and better spatial resolution

MULTIX®
Xray Spectrometric Imaging

ME100 SYSTEM

The ME100 is based on the innovative combination of a semiconductor crystal (CdTe/CZT), unique ASICs and high-speed front-end electronics capable of precisely measuring the energy of each incident X-Ray photon. The ME100 acquires the signature of each specific material in real time, therefore enabling the categorization of contaminants for QA tracking.

The ME100 has a modular architecture built up from separate detection modules (DM). Each module contains a 10 cm long array of 128 pixels and can be daisy chained to 19 other modules to form a 200 cm linear detector array. The data is transferred to the host system via an interface board using a Giga-Ethernet link. A MultiX API (Windows or Linux compatible) residing on the host computer controls the data flow and format.
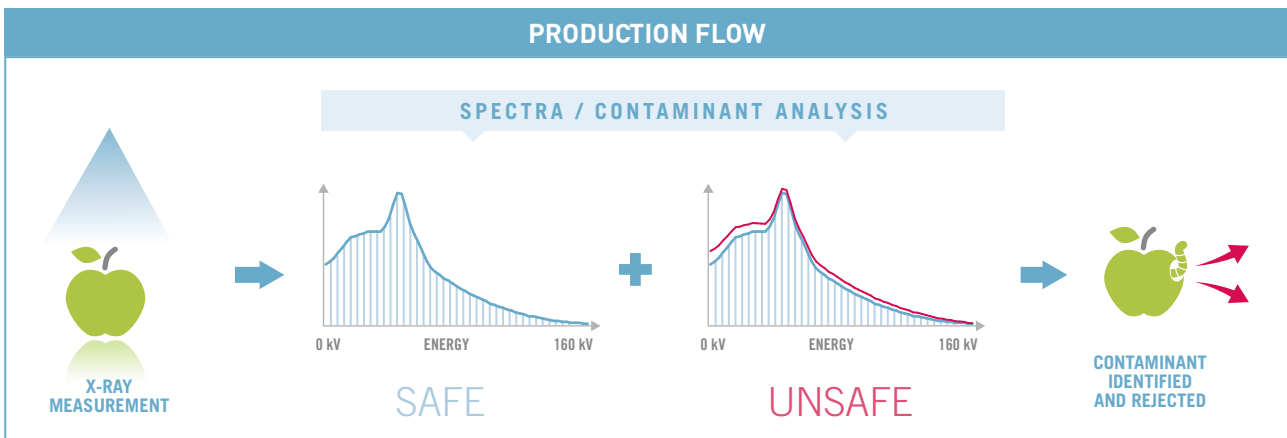
The ME100 counts all the photons in real time. It precisely measures the energy of each photon and reconstructs the spectra over a maximum of 256 energy bins between 20 and 160 keV.

The number of energy bins is flexible and can be configured to match the host systems data transfer and processing capacity.

ME100 DAS CONFIGURATION

- ME100 Modules in daisy chain
- Up to 2 meters of detection line with 2560 pixels
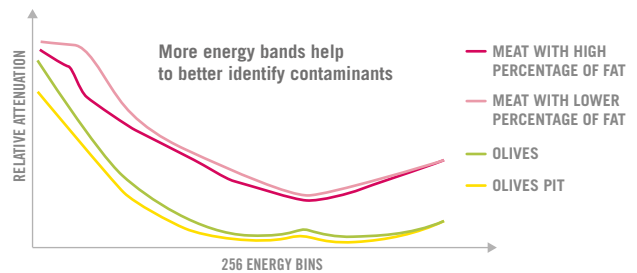
BENEFITS FOR FOOD PROCESSORS

Each material has a specific X-Ray signature, ME100 spectrometer allows for real time identification of each material being screened. ME100 spectral digitalization improves the equivalent material and density analysis.

PRODUCTION FLOW

SPECTRA / CONTAMINANT ANALYSIS

X-RAY MEASUREMENT → SAFE + UNSAFE → CONTAMINANT IDENTIFIED AND REJECTED

BENEFITS FOR OEMs

For OEMs, the ME100 detector is configurable by software to be adapted for each specific customer application.

Multi energy data allows for improved differentiation and categorization between materials that are very similar.

More energy bands help to better identify contaminants

- MEAT WITH HIGH PERCENTAGE OF FAT
- MEAT WITH LOWER PERCENTAGE OF FAT
- OLIVES
- OLIVES PIT

OTHER APPLICATIONS

Today many customers active in security, mining, recycling, petroleum, constructions, science industries or others are gaining benefit from using this technology.