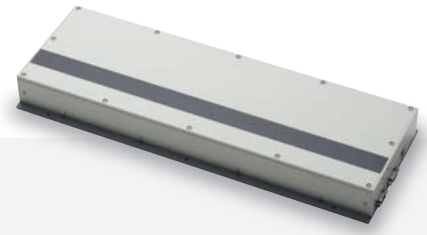
NEW

Dual energy X-ray line scan camera

C11800 series

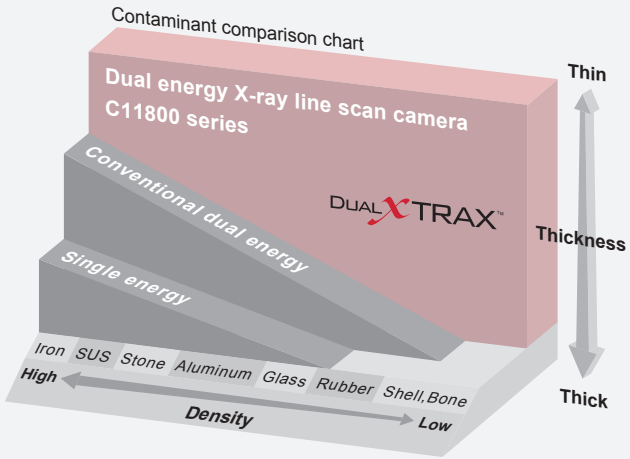
Sample: Chicken breast
Contaminant: Bone

A revolution in contaminant inspection



New standard of X-ray in-line non-destructive testing

The Dual energy X-ray line scan camera simultaneously captures both low and high energy images with a single X-ray source and computes the two images, enabling the inspection of contaminant that could not be detected by a single energy.
The C11800 series makes it possible to perform advanced contaminant detection such as "low density contaminant "and" a thin contaminant", which were previously difficult to detect.



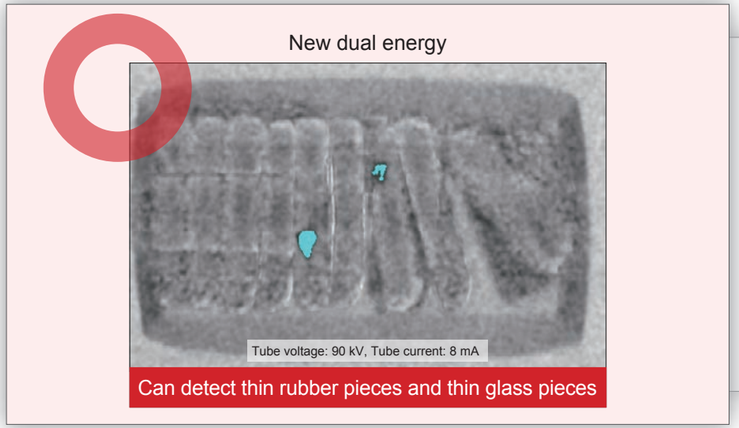
HAMAMATSU

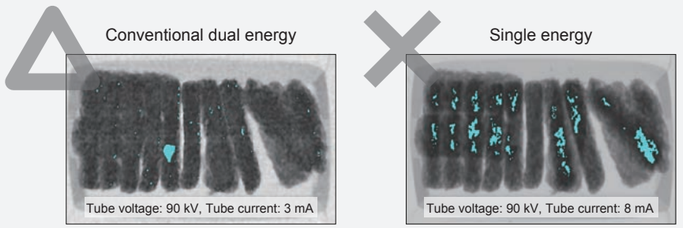
PHOTON IS OUR BUSINESS

Next-generation X-ray detector equipped with “DualXTRAX™” technology to increase the contaminant detectability

The Dual energy X-ray line scan camera C11800 series combines a next-generation X-ray detector improving its performance over previous models. With new DualXTRAX computing technology, it is now possible to perform advanced detection that detects “low density contaminant” such as chicken bones and rubber fragments, as well as “thin contaminant” such as metal rust and glass fragments, all of which were previously difficult to detect.

■ Comparison of contaminant detection inspection images





• Hushed brown potato

Transport speed: 10 m/min

X-ray source-detector distance: 550 mm

HARDWARE

Next-generation X-ray detector featuring

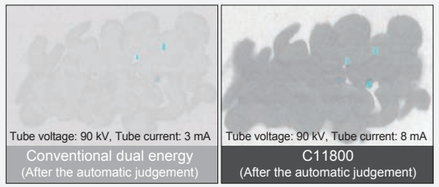
■ Improved simultaneous detection for contaminants of with improved feature

The high dynamic range enables detection of thin, low-density contaminant such as rubber and glass fragments as well as high density contaminant such as metal and stone.

• Peeled shrimp

Transport speed: 20 m/min

X-ray source-detector distance: 550 mm

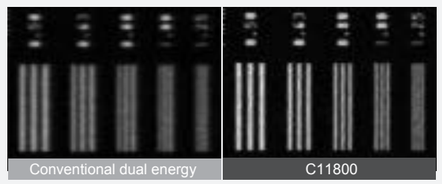


■ High resolution

The improved resolution provides a clearer image of the object.

• Resolution chart

Tube voltage: 60 kV
Tube current: 8 mA
Transport speed: 56.72 m/min
X-ray source-detector: 750 mm



A technology for integrating next-generation hardware and software

DUALXTRAX™

SOFTWARE

Next-generation computing technology

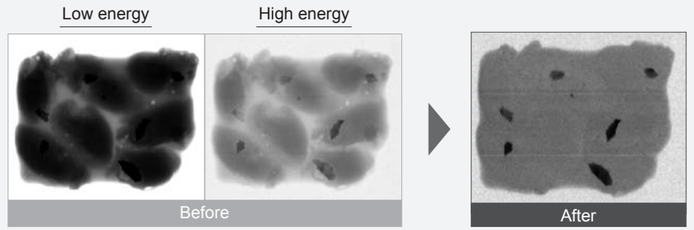
The sensitivity of contaminant detection has been dramatically improved by removing unnecessary information through next-generation computing technology with combination of the improved hardware.

• Fresh oyster

Tube voltage: 80 kV, Tube current: 4.3 mA

Transport speed: 20 m/min

X-Ray source-detector distance: 550 mm



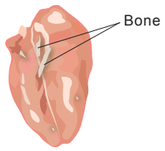
Displays only contaminant not affected by the background.

Application examples

Residual bone test

It is possible to detect bone left in chicken breast meat.

• Chicken breast

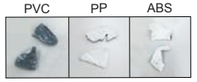


Tube voltage: 100 kV, Tube current: 8 mA
Transport speed: 10 m/min
X-ray source-detector distance: 550 mm

C11800
(After the automatic judgement)

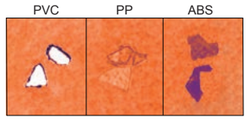
Materials discernment

Different materials can be distinguished.



Visible image

Tube voltage: 80 kV, Tube current: 10 mA
Transport speed: 20 m/min
X-ray source-detector distance: 550 mm



PVC and ABS judgement by pseudo color.
PP is out of judgement.

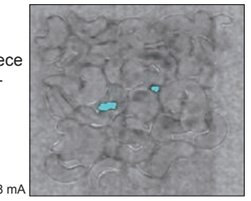
C11800
(After the automatic judgement)

Contaminant inspection in package

• Cashew nuts

It is possible to detect thin rubber pieces in cashew nuts.

Tube voltage: 90 kV, Tube current: 8 mA
Transport speed: 20 m/min
X-ray source-detector distance: 550 mm

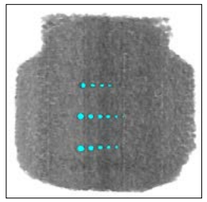


C11800
(After the automatic judgement)

• Cereal

It can detect metal fragments in cereals made from a mix of materials, including oats and dried fruit.

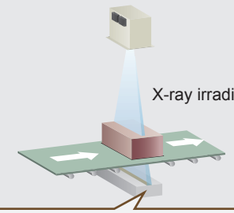
Tube voltage: 100 kV, Tube current: 8 mA
Transport speed: 10 m/min
X-ray source-detector distance: 550 mm



C11800
(After the automatic judgement)

What is Dual energy?

Conventional in-line non-destructive X-ray inspection using single energy detects materials and contaminant by the difference in the density of X-ray transmission images. However, in many cases, it is difficult to distinguish contaminant only by the gray level of an actual object because of the complex shape and uneven surfaces (i.e. variation of thickness) of various substances in the object, making X-ray transmission inconsistent. Dual energy X-Ray line scan camera have two sensors arranged vertically to simultaneously capture low and high energy images from a single X-ray source.By processing these two images, it is possible to detect contaminant that could not be detected by conventional in-line non-destructive X-ray inspection.



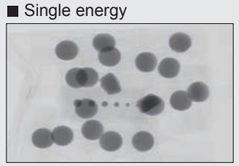
*The software can automatically correct the difference in magnification between two images.

Contaminant detection from a similar density object

Even for a sample which makes equivalent gray level in the X-ray transmission images taken by single energy, dual energy technic enables to distinguish a contaminant from an object making enough contrast between those materials.

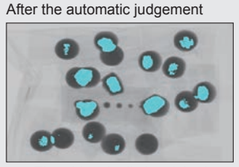
Tube voltage: 80 kV, Tube current: 16 mA
Transport speed: 10 m/min
X-Ray source-detector distance: 550 mm

■ Single energy



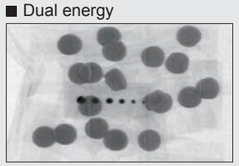
Object and contaminant are displayed in the same gray level.

After the automatic judgement



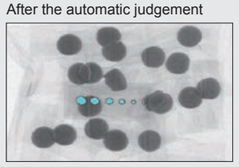
The object is distinguished as a contaminant.

■ Dual energy



Object and contaminant are displayed in the different gray level.

After the automatic judgement

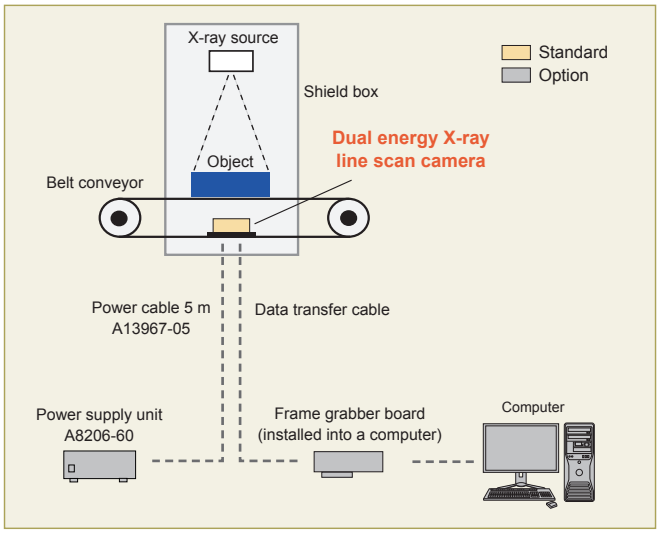


Only contaminant can be distinguished.

SPECIFICATIONS

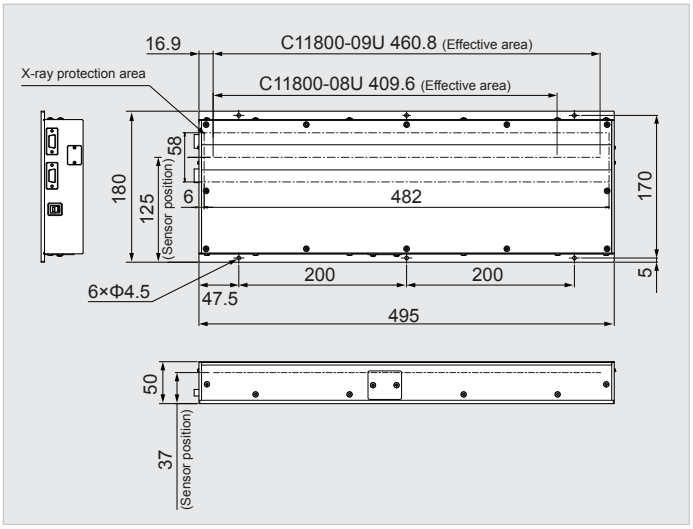
Product number	C11800-08U	C11800-09U
Camera type	Dual energy X-ray line scan camera	
Detection method	Scintillator method	
Effective X-ray tube voltage range	Approx.25 kV to 160 kV	
Sensor element pitch	0.4 mm	
Detection width	409.6 mm	460.8 mm
Line speed	4 m/min to 100 m/min	
A/D converter	14 bit	
Output signals(Image data)	14 bit digital output	
External control	USB 3.0	
Power supply	DC +15 V to +24 V	
Ambient operating temperature	0 ˚C to +40 ˚C	
Ambient operating humidity	30 % to 80 % (With no condensation)	
Performance guaranteed temperature	0 ˚C to +40 ˚C	
Ambient storage temperature	-10 ˚C to +50 ˚C	
Ambient storage humidity	30 % to 90 % (With no condensation)	

SYSTEM CONFIGURATION EXAMPLE



Note
- The Dual energy X-ray line scan camera consists of only a camera head. The image display equipment (computer and frame grabber board) and the X-ray source, etc. should be ordered separately.
- The power supply unit is also optional.

DIMENSIONAL OUTLINES (Unit: mm) (Approx.6.5 kg)



Options

- Power supply unit: A8206-60
- Power cable 5 m: A13967-05
- Software API Support (Microsoft Windows)
  - DCAM-API (http://www.dcamapi.com)

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