FOR ALL YOUR SECURITY NEEDS

CONTAINER INSPECTION SYSTEM

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UNISCAN
INTELLIGENT INSPECTION SYSTEMS & ENGINEERING

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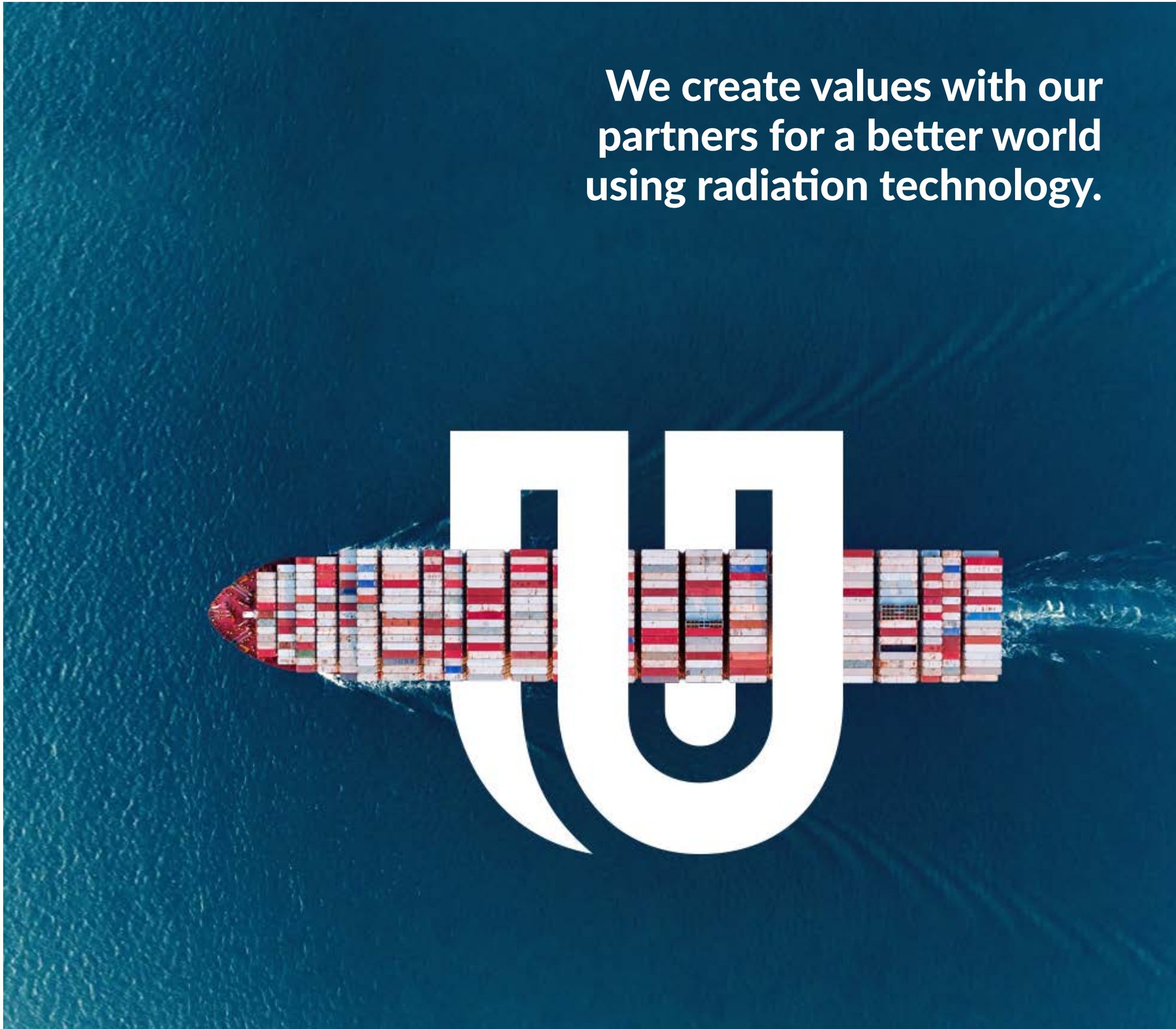
FOR ALL YOUR SECURITY NEEDS

Who we are

UNISCAN is a manufacturer & operator of security systems such as container inspection systems for ports and borders globally. Our advanced container systems have been successfully installed and in operation in the major ports in Korea, and we are product partners in Asian Ports.

Technology from KAERI

UNISCAN's security inspection technology is based on the radiation technology of KAERI (Korea Atomic Energy Research Institute), which is one of the largest and longest-history national research institutes in Korea. Dr. B.C. Lee, the CEO and founder of UNISCAN worked at KAERI for 26 years as a project leader and developed various radiation technologies such as container inspection systems and non-destructive testing systems.



Where we stand

UNISCAN offers the best and complete services with a cargo inspection system optimized for customers' needs. The system includes container scanners, all auxiliary facilities and services necessary for the inspection over container cargo installation. That is equipped with container scanners, Infrastructure, networks, and civil engineering work.

Incheon Port

Pyeongtaek Port

Busan Port

Gwangyang Port

1 CUSTOMIZED DESIGN of container inspection systems optimized for customers' needs.

2 INTEGRATED TURN-KEY SOLUTION of container inspection center equipped with scanners, all auxiliary facilities, and civil engineering.

3 WORLD-BEST PERFORMANCE SPECIFICATIONS with the highest penetration, wire detection, materials discrimination, etc.

4 SYSTEMATIC MAINTENANCE SERVICE using log-books and networks.

UNISCAN's scanners are the inspection system you can trust. Choose UNISCAN as your inspection system to ensure that your analysis is compliant with safety standards.

Performances of UNISCAN's Container Inspection Systems

High-quality Image
Dual-energy X-ray
X-ray Penetration up to 430mm of steel
Wire Detection 0.5mm (wire in air)
Materials Discrimination (Organic/Inorganic)
Small Beam Size (less than 1.5mm)
Auto-Calibration
Logbook Function

Pyungtaek Port Container Inspection Center

Our products

UNISCAN DF-9 | dual-view fixed
UNISCAN SF-9 | single-view fixed
UNISCAN ATS-6 | automatic towing system
UNISCAN SG-6 | gantry fixed

MODEL	OPERATION MODE	ENERGY (MeV)	PENETRATION (mm)	WIRE DETECTION (mm)	THROUGHPUT (Scan/hour)
UNISCAN DF-9	Dual-view fixed	9/6	430	0.5	10-15
UNISCAN SF-9	Single-view fixed	9/6	430	0.5	10-15
UNISCAN ATS-6	AVG-guided fixed	6/4	400	0.5	50-70
UNISCAN SG-6	Gantry Fixed	6/4	400	0.5	10-15

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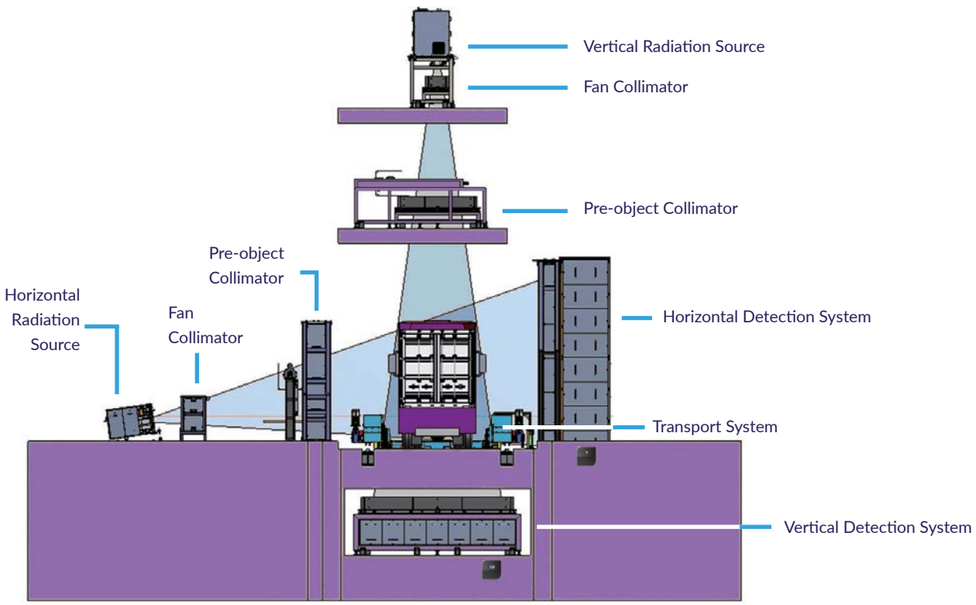
DF-9 / SF-9 Fixed

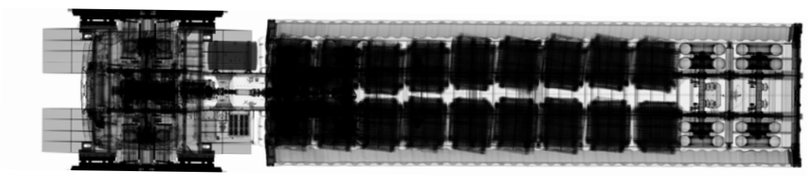
Main Features

- **Throughput 10-15 unit/hr**
- **Radiation Source 9/6MeV**
- **Materials Discrimination (organic/inorganic)**
- **Penetration up to 430mm of steel**
- **Wire Detection 0.5mm wire in air**
- **Dual Energy X-RAY**

UNISCAN DF-9 is a dual-view (bi-directional) fixed container inspection system that uses two sets of X-ray sources and detector arrays in the horizontal and vertical direction, respectively. Bidirectional scanning guarantees a higher probability of exposing hidden smuggled goods in containers. A cargo moving system pulls containers at the speed of 400 mm/sec. The system can distinguish organic materials from inorganic materials using dual-energy X-ray technology and an efficient material discrimination algorithm.



Item	Specification
Radiation Source	· 9MeV / 5MeV · Focal Spot size : < 1.5 mm · Beam Symmetry : ≤ ±5% within the range of ±7° from beam center · Radiation Leakage : < 0.002%
Detector	· CdWO4 Photodiode Type (Coupled Scintillator) · Pitch Size / Efficiency : 4.6mm / above 70% · Pixel : Horizontal_1376(43*32), Vertical_1056(33*32) · Alignment Accuracy : +/- 1mm · Dual Energy Processing Time : < 3 second
Transport System	· Overall Size : 5.0m(L) X 5.6m(W) X 1.2m(H) · Scan speed 400mm/sec (variable) · Throughput : 10 - 15 units/hour · Traction : 70T
Image	· Real-time Image Manipulation · Histogram Equalization · Edge Enhancement · NUREG-700 Rev2 Human System
Server Network	· More than 1Gbps



Vertical-view x-ray inspection image.

Horizontal-view x-ray inspection image.

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ATS-6 Automatic Towing System

Main Features

- Throughput 50-70 unit/hr
- ATSs 2~3
- Penetration up to 400mm of steel
- Realtime calibration
- No radiation hazard

UNISCAN ATS-6 is an innovative container inspection system with high scanning throughput and radiation safety. After the driver gets off the cabin, the cargo is pulled by a set of circulating Automatic Towing System(ATS). Drivers do not need to enter the tunnel (radiation control zone), and radiation safety is guaranteed. Using three sets of circulating ATS, the throughput increases up to 70 cargos per hour.

Item	Specification
General Specifications	· Maximum vehicle size : 2.5m(W) x 4.6m(H) x 15m(L) · Standard operators : 2
Technical	· Detectors : CdWO4 · Steel penetration : 400mm · Wire detection : 0.5mm
X-RAY Generator	· X-ray source : Electron linear accelerator · Energy : 6/4MeV · Beam direction : sideways
Electrical	· Power consumption : 100KVA · Power requirements : 380VAC, 60Hz
Installation & Environmental	· Operating temperature : -10°C ~ 60°C · Storage temperature : -20°C ~ 70°C · Humidity : 95% non-condensing
Computer & Video	· Platform : Windows 10 · Display type : 27" curved monitor · Display resolution : QHD resolution

ATS-6

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SG-6 Gantry Fixed

Main Features

- Throughput 10-15 unit/hr
- Penetration up to 400mm of steel
- Realtime calibration
- No radiation hazard

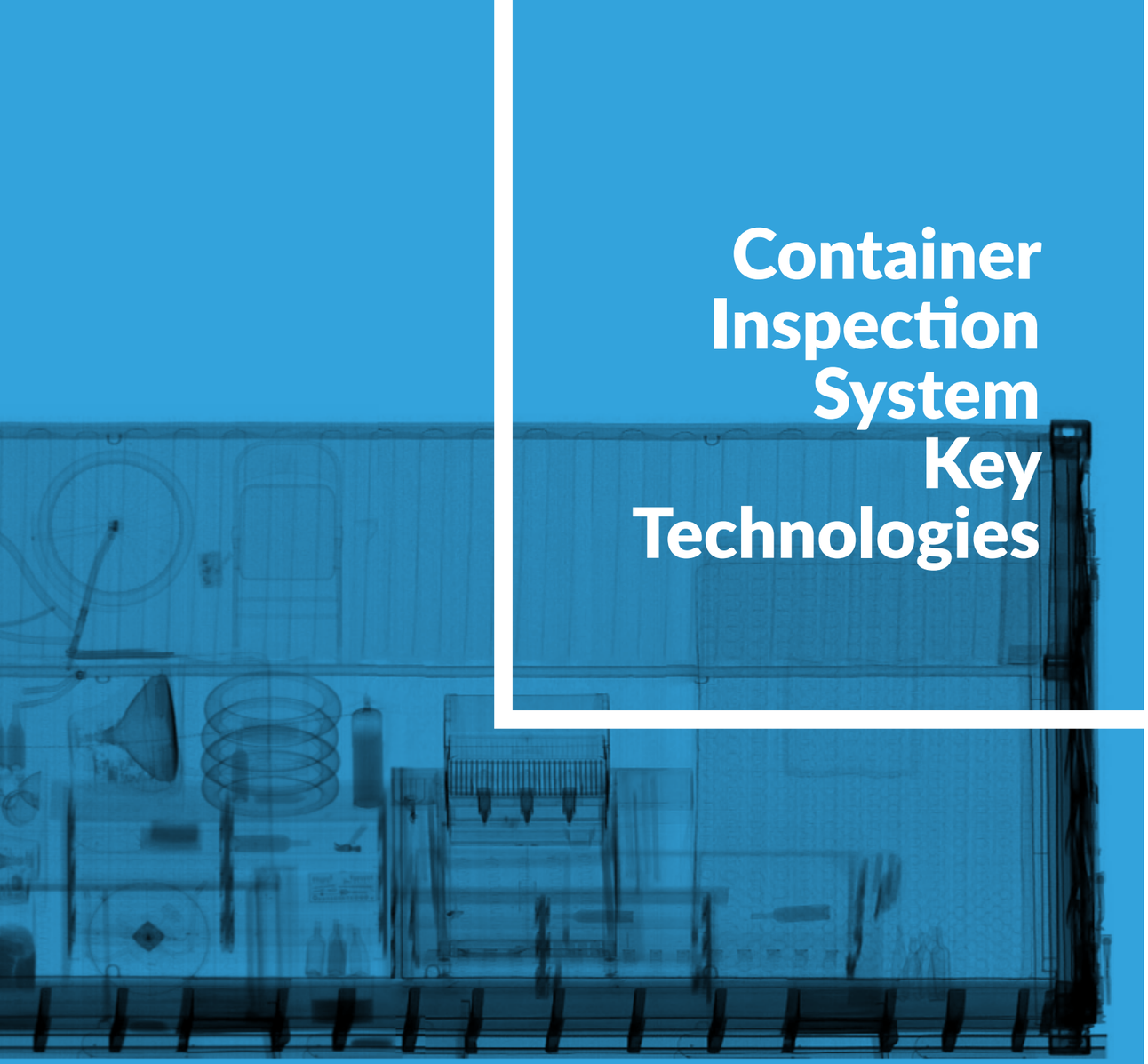
The X-ray source, collimators, and detector array are mounted on a gantry moving over the rail. Drivers get off the truck and waits in a radiation-safe room while container cargo is scanned. Precise control of gantry speed less than 1% error ensures a clear image with no deformation. Organic/Inorganic materials are discriminated using dual-energy X-ray technology.

Item	Specification
General Specifications	· Maximum vehicle size : 2.5m(W) x 4.6m(H) x 15m(L) · Standard operators : 2
Technical	· Detectors : CdWO4 · Steel penetration : 400mm · Wire detection : 0.5mm
X-RAY Generator	· X-ray source : Electron linear accelerator · Energy : 6/4 MeV · Beam direction : sideways
Electrical	· Power consumption : 100KVA · Power requirements : 380VAC, 60Hz
Installation & Environmental	· Operating temperature : -10°C ~ 60°C · Storage temperature : -20°C ~ 70°C · Humidity : 95% non-condensing
Computer & Video	· Platform : Windows 10 · Display type : 27" curved monitor · Display resolution : QHD resolution

GT-6

All UNISCAN systems are available with our dedicated installation, training, maintenance, and technical support.

From groundbreaking technology, to construction and personnel, UNISCAN is able to provide everything you need with safety as our top priority.



Container Inspection System Key Technologies

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INTELLIGENT DETECTION SYSTEMS & ENGINEERING

Radiation Source System

Item	Specification	
External Dimensions	700 x 1390 x 950mm	
Weight	< 2.0 t	
X-ray energy	9MeV	6MeV
X-ray max. dose rate	30 Gy/min @ 1m	8 Gy/min @ 1m
HVL	3.00cm	2.80cm
Spot size	< 1.5mm	
Beam uniformity	Less than ±5% within ±7.5° of beam center	
Control device	Touchscreen + PC	
Cooling device	Water cooling	
Leakage dose rate	Less than 2/100,000 in 60° at 1m from beam center	

Detector System

Perfectly optimized detection systems for Dual Energy CIS *(Container Inspection System)*

Classification	Description	Note
Type of sensor	CdWO4 Photodiodes type	
Pitch size	4.6mm	
A/D converting	20Bit/Sample	
Resolution	Horizontal : 1376 pixels (32pixel/module)	
Detection method	Scintillating Crystals Coupled with Photodiodes	Linac PPS=100Hz
Scan ratio	163line/sec or 6.13ms/line	
Detector module	Horizontal : 43modules, vertical : 33modules	
XCU	Horizontal : 1set, vertical : 1set	

Transport System

Classification	Description	Note
Tow capacity	Max. 70 ton (including cargo container)	Cargo container weight: about 10t
Feeding speed	· Operation : 400mm / sec · Max : 700mm /sec (Unloaded)	
Clamping type	Motorized/Hydraulic Type	
Control system	PLC Control (Siemense)	
Vehicle structure	Modular Type for Simple Maintenance	4 module

Operation System

- I/F connection status
- Verification of motion unit status of each equipment
- Cargo information
- Real-time search image and equipment control

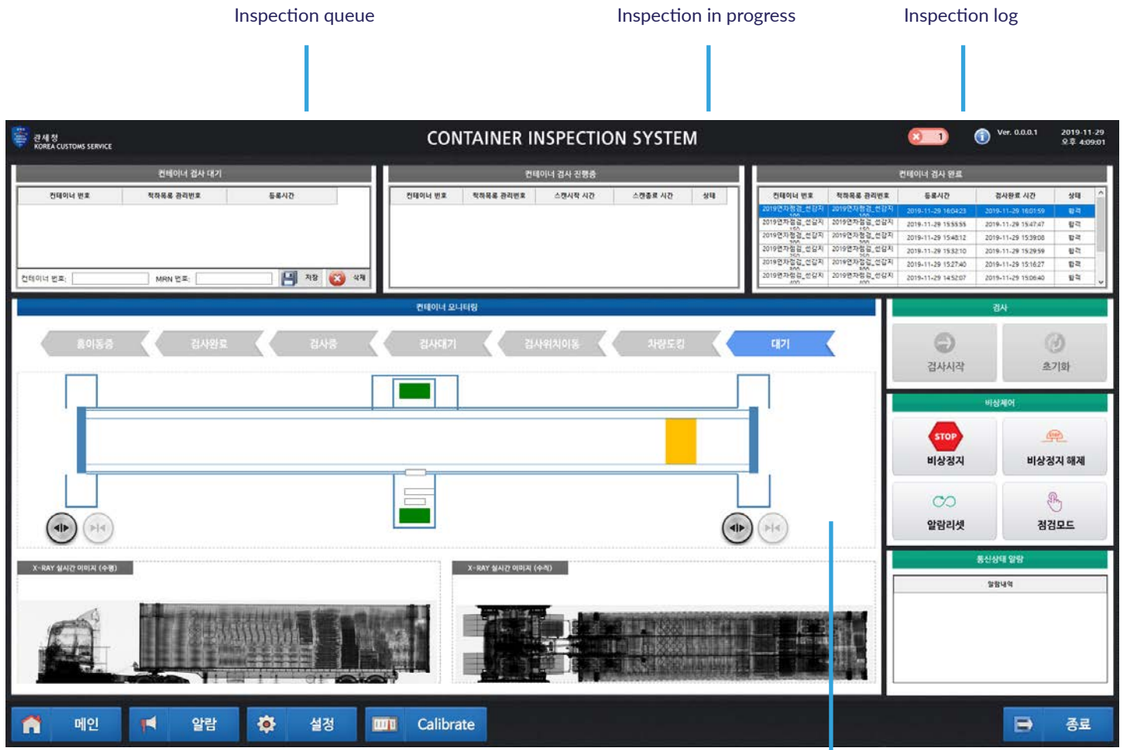
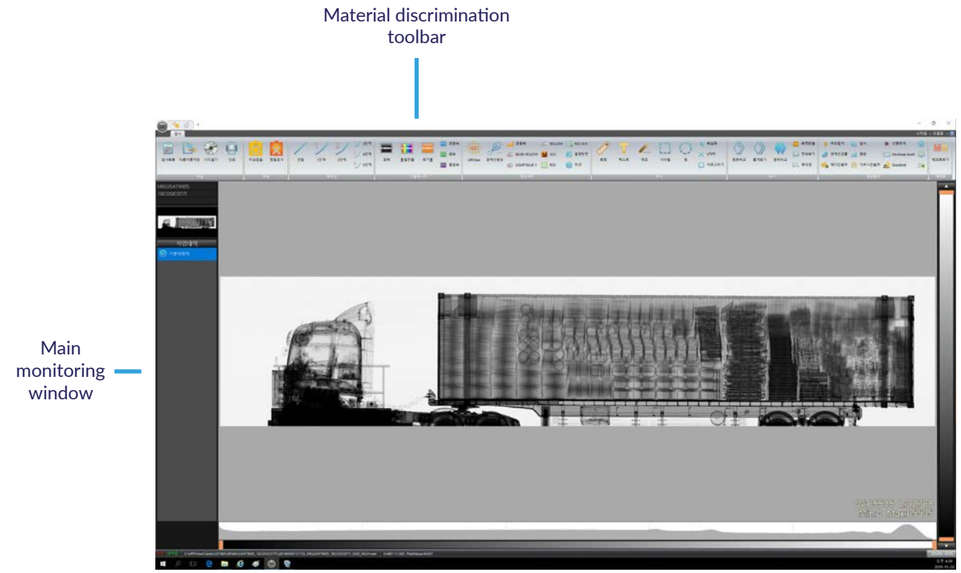
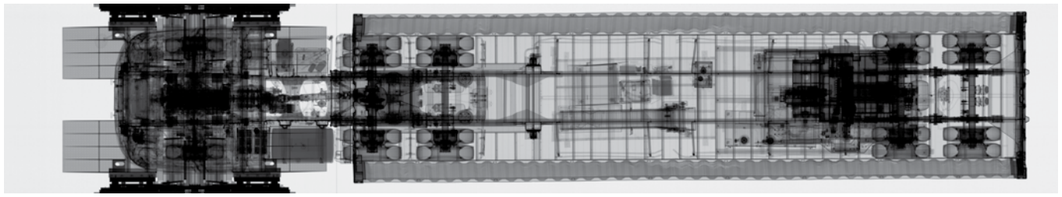


Image System

Screen	Menu
Dual-energy toolbar	Dual-energy color display button
	Highlight organic material button
	Highlight inorganic material button
	Highlight metallic material button
	Highlight heavy metallic material button
Color map	Organic (orange), inorganic (green)
Main monitoring window	The highlighted dual-energy image is displayed on the window

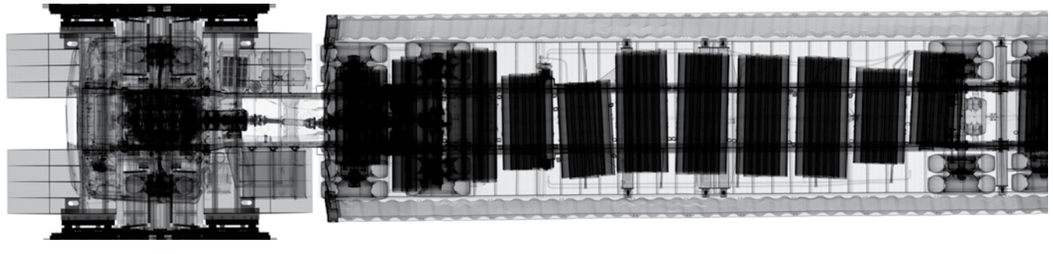


X-ray images



Vertical view of a UNISCAN x-ray inspection.

Horizontal view of a UNISCAN x-ray inspection.



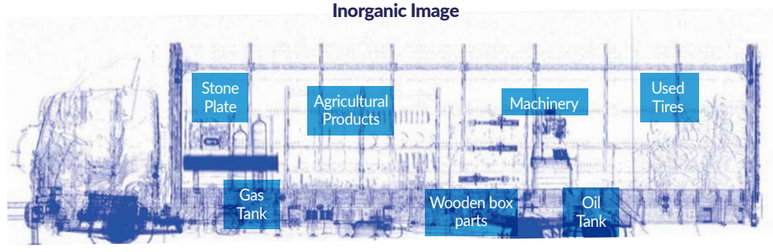
Vertical view of a UNISCAN x-ray inspection.

Horizontal view of a UNISCAN x-ray inspection.

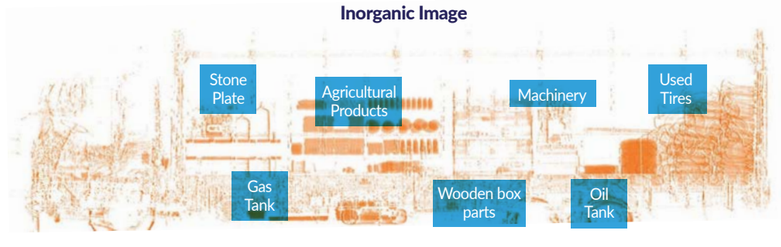
Materials Discrimination

Original Image

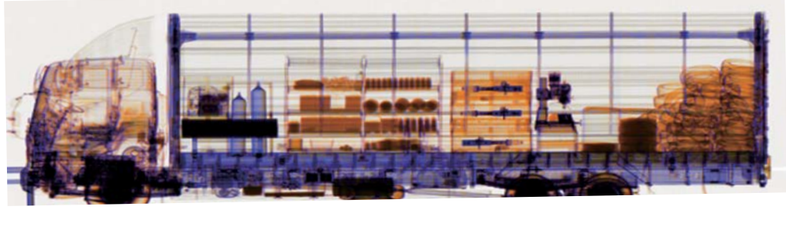
Inorganic Image



Inorganic Image



Final Image



When it comes to Container Inspection Systems, Uniscan provides a complete service.

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Uniscan's fixed cargo inspection system in Pyeongtaek, South Korea.