Ground-breaking parcel inspection

AS&E’s ground-breaking Gemini parcel X-ray inspection system combines dual-energy transmission with patented Z Backscatter technology for the most comprehensive threat detection available for parcel and baggage screening. The Gemini system’s unique capability to detect both metallic and non-metallic threats—even in cluttered environments—makes it an invaluable inspection tool for security officials.

Powerful combination of technologies

The power of the Gemini system lies in its ability to simultaneously detect both inorganic and organic materials by combining dual-energy transmission and Z Backscatter X-rays—two complementary, advanced, and commercially proven technologies. Together, they provide the most information available about the contents of a parcel.

Multi-technology

The Gemini system’s dual-energy transmission X-rays generate a high-resolution image in which metallic threats, such as guns and knives, are easily detected and fine details, such as tiny wires that could indicate an improvised explosive device, can be discerned. Dual-energy transmission technology uses two X-ray energy levels to determine the “effective” atomic number of objects in the parcel and then colorizes the image based on material type.

The Gemini system’s Z Backscatter X-rays generate a photo-like image in which organic materials—such as sheet, bulk, and liquid explosives, narcotics, and plastic weapons—are bright white. The easy-to-interpret images produced by Z Backscatter technology also help to reduce operator fatigue.
### Operating Features

**X-ray Sources**
- Dual-energy source: 170 keV
- Z Backscatter source: 160 keV

**Tunnel Opening**
- Width: 105 cm (41.3 in)
- Height: 102.5 cm (40.3 in)
- Length: Unlimited

**Conveyor**
- Continuous operation in normal mode. Auto-return allows one-person operation.
  - Width: 105 cm (41.3 in)
  - Height: 90 cm (35.5 in)
  - Capacity: 200 kg (440 lbs) distributed
  - Speed: 24 cm/s (47.3 ft/min)

### System Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>420 cm (165.4 in)</td>
</tr>
<tr>
<td>Width</td>
<td>149.8 cm (59 in)</td>
</tr>
<tr>
<td>Height</td>
<td>203.2 cm (80 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>1818 kg (4000 lbs)</td>
</tr>
</tbody>
</table>

**Transmission beam orientation:** Diagonally upwards
**Z Backscatter beam orientation:** Vertically upwards

### Temperature

- Operating: 0° C to 40° C (32° F to 104° F)
- Storage: -20° C to 60° C (-4° F to 140° F)
- Humidity: 5% to 95% relative humidity (non-condensing)

### System Features

- Systems diagnostics screen
- Monitors: Two 22-inch 16:9 LED color monitors
- Intel® i5-2400 processor
- >3.4 GHz, Quad Core
- >6 GB RAM
- >500 GB hard drive
- Two USB ports
- System utilization display (X-ray hours, system hours, number of inspections)
- Network-capable
- Image save and restore
- Autosave

### System Options

- 24-inch 16:9 LED color monitors
- Color printer
- Global power conditioning (Sola Regulator) 50 or 60 Hz
- Steel roller tables (2 ft, 4 ft, 6 ft)
- Stainless steel exit trays (4 ft, 6 ft)
- Remote console capability (25 ft, 50 ft, 75 ft, 100 ft)
- Threat Image Projection (TIP)
- Centralized TIP Management
- Computer-based training
- Ergonomic mobile monitor and operator's console cart
- Imaging test fixture
- Gamma Radiation Detector
- ASE Connect™ networking solution
- ASE Learn™ training solution

### Health and Safety

Operator receives less than 1.0 µSv/hr (0.1 mR/hr) at 5 cm (2 in) from cabinet.

Complies fully with all applicable federal health and safety regulations: Center for Devices and Radiological Health Standards for Cabinet X-ray Systems (21 CFR subchapter J Section 1020.40).

Film-safe

### Image Display

**System Performance**

- Resolution*: 38 AWG guaranteed, 40 AWG typical
- Penetration*: 30 mm guaranteed, 34 mm steel typical
- Contrast: 16,000 gray levels visible

Complete coverage of objects in tunnel—no corner cutoff

* Per AS&E test fixtures

**Detection Capability**

High-resolution dual-energy transmission X-ray provides:
- The ability to detect inorganic “High Z” objects such as guns, knives, and IED wires, and provides metallic and organic discrimination in uncluttered environments.
- Z Backscatter detects organic “Low Z” objects such as explosives, plastic weapons, and drugs.

**Operator’s Console**

User-friendly ergonomic control panel. Two high-resolution displays present separate and simultaneous transmission and Z Backscatter images.

**ASEInspection Software**

ASEInspection is the Windows-based application software used to convert X-ray data into images. It contains a suite of tools for manipulating and enhancing images and is used for image storage and retrieval.

**Image Analysis Tools**

- Auto Enhance: Improves resolution of the image by optimizing contrast throughout, thereby enhancing subtle differences in the image
- Color Palette: Adds the ability to evaluate images and areas of interest in greater depth using color
- Continuous Zoom: Zooms images to 16x magnification
- Density Expand: Adjusts the contrast of the displayed image, thus enhancing the differences in objects
- Edge Enhancement: Accentuates the edges of objects in the image, enabling the operator to recognize objects faster and more readily
- Mark and Annotate: Attaches pointers and comment fields to mark an area of interest in an image
- ASE Frame: Automatically frames areas of high density where X-rays do not penetrate
- High: Changes image contrast so details of high penetration are more defined
- Metallic Stripping: Strips out inorganic material, leaving only those colored orange or green and enabling the operator to better identify organic materials
- Organic Stripping: Strips out organic material, leaving only those colored green or blue and enabling the operator to better identify inorganic materials
- View Z: Toggles the image between black-and-white and Zeff-associated colors, allowing the operator to better discriminate different materials in the image