Millimeter Wave Imaging Solutions to Maximize Cube Utilization

Maximizing cube utilization in your supply chain is critical to cost optimization and meeting your customers’ requirements for fulfilling their products efficiently.

At the package level, visibility is key. ThruWave’s technology enables a completely different class of visualization beyond what is possible from cameras alone: Our sensors can see inside of sealed packaging, enabling you to automatically verify proper packing and flag exceptions.

A typical e-commerce parcel may contain up to 40% air. Differentiate yourself with shipping efficiency that far exceeds industry average. Provide your customers with real-time feedback on how their packaging performs in the fulfillment process.

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**40% void space:**

- Creates a **15% minimum** increase in cardboard usage
- Requires at least **60% more** filler material
- Raises transportation costs by **20% or more**

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Cube Utilization Detection

ThruWave’s mmWave sensors see through packaging materials to make 3D images of both package and contents at conveyer speeds. ThruWave 3D datasets are similar to a CT scan, but without the health hazard and size/cost of an X-ray system.

ThruWave’s sensor systems dimension individual items prior to packing for optimum cube utilization. The sensor systems also see inside the packages to be shipped, enabling you to divert poor cube utilization.

Improved packing yields:
- Increased warehouse storage capacity
- Increased transportation efficiency
- Decreased risk of product damage

What are Millimeter Waves?

Millimeter waves are defined as radio waves at frequencies between approximately 17.5 GHz and 200+ GHz, corresponding to wavelengths between 20 mm and 1 mm. Millimeter waves are human safe, but penetrate most non-metallic packaging materials like cardboard boxes and totes, plastic boxes and totes, and dunnage such as paper, peanuts, or air packs.
Technology Stack and Integration Into Existing Systems

The ThruWave Technology Stack is composed of sensor hardware to emit and detect reflected mmWave signals, machine learning software to reconstruct 3D images and analyze the data, and an API to relay these actionable items.

The ThruWave API seamlessly integrates with existing data flows into Warehouse Management System software platforms. The actionable items (like cube utilization measurements) enhance visibility at the Enterprise Resource Planning software level.