

Pharma & Medical

Industry Application

Overview

Medical packaging and transdermal patches require 100% defect-free production. Regulatory compliance (FDA 21 CFR Part 11) drives a need for data validation. R2R provides a **Vision System in a Sensor Package** that offers the clean, traceable, and precise web handling solutions demanded by the pharmaceutical industry. With **comprehensive inspection capabilities** and **no programming needed**, our systems offer validated precision without the complexity of custom vision systems.

The Engineering Challenge

Medical converting combines strict quality standards with difficult materials.

- **Validation & Traceability:** Manufacturers must prove that every millimeter of the web was aligned and inspected.
- **Contamination Risks:** Equipment must be cleanable. Mechanical moving parts (like motorized sensor slides) generate particulates and are a contamination risk.
- **Complex Materials:** Tyvek (porous), clear forming films, and foil backings are often used on the same line, requiring a sensor that handles all without recalibration.

The R2R Technical Advantage

Our solutions are built for clean rooms and data-driven manufacturing with **operational simplicity**.

- **Clean Room Compliance:** The **one-sided, fully enclosed sensor design** minimizes particle traps and is easy to wipe down. The lack of moving parts makes it ideal for sterile environments.
- **0.016 mm Precision:** Sub-pixel resolution ensures absolute alignment for critical registration tasks, functioning as a high-precision vision system.
- **Data Connectivity:** Our SCU6x controller offers Industrial Ethernet (EtherNet/IP, PROFINET), allowing position data to be logged to the PLC for batch validation. App-based logging can also export CSVs for QA records.
- **Material-Independent:** Handles Tyvek, foil, and film interchangeably without setup changes. **No calibration required** when switching materials reduces changeover risks.

Key Applications

1. Medical Packaging Inspection

Used in slitter rewinders for pharmaceutical packaging materials where 100% inline inspection is required. The system validates that slit widths meet strict QC lab standards without stopping the machine for manual sampling, ensuring regulatory compliance.

2. Blister Pack Registration

Ensure the foil backing aligns perfectly with the formed plastic blister. R2R sensors track printed registration marks or the physical edge of the blister formation with 0.016 mm precision to prevent seal breaches.

3. IV Bag Manufacturing

Accurate width measurement for narrow blown film used in IV bags. The sensor ensures the dimensional integrity of the tubing, which is critical for medical dosing and fluid delivery.

4. Void Detection

The sensor's simple inspection capability detects voids (e.g., missing tablets in a blister stream) before sealing, preventing defective product from leaving the line.

5. Clean Room Guiding

Eliminate contamination sources. Our solid-state sensing and electromechanical guiding replace hydraulic systems and open mechanical slides, maintaining ISO clean room standards.

Supported Web Guiding Solutions

Validated precision for medical manufacturing.

- **Center Guiding:** Ensures that forming films and backing foils are perfectly centered during the blistering process.
- **Line & Contrast Guiding:** Tracks printed registration marks on lid foil to ensure that text and branding align perfectly with the sealed blister packs.
- **Edge Guiding:** Used for general web transport of medical grade papers, Tyvek, and films through coating or sterilization processes.

Technical Comparison

The "Scanner vs. Laser Pointer" Analogy: Comparing an R2R Sensor to a standard photo-eye is like comparing a flatbed scanner to a laser pointer. A laser pointer sensor might miss a tiny void or misread a Tyvek edge due to texture. The R2R sensor (scanner) verifies the integrity of the seal area and the presence of the product with complete **spatial awareness**, ensuring patient safety.

- **Cleanliness:** Competitors use Motorized Slides (Particulates). R2R uses **Solid State Sensing** (Clean).
- **Validation:** Standard systems are "Black Boxes." R2R offers **Full Ethernet Data Logging**.
- **Tyvek Handling:** Porosity confuses ultrasonics. R2R handles **Tyvek, Foil, & Film** equally well.
- **Simplicity:** No complex setup. R2R is **Plug-and-Play**.