ALM Automation

Automatic Loading & Unloading + Double-Sided In-Line Lamination + Intermediate Flipping

Vision-Based In-Line Labeling Equipment Solution

Date: 2026 Version: V2.0

Project Rendering

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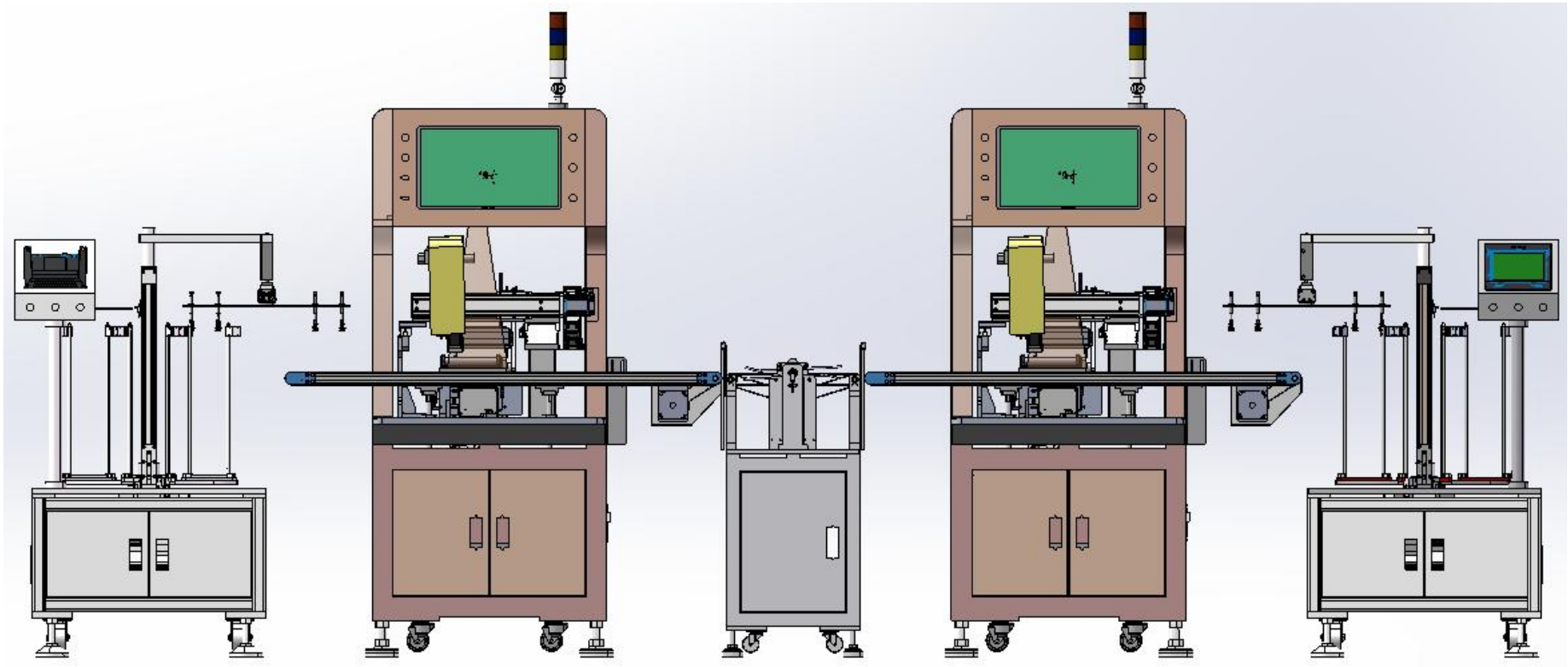
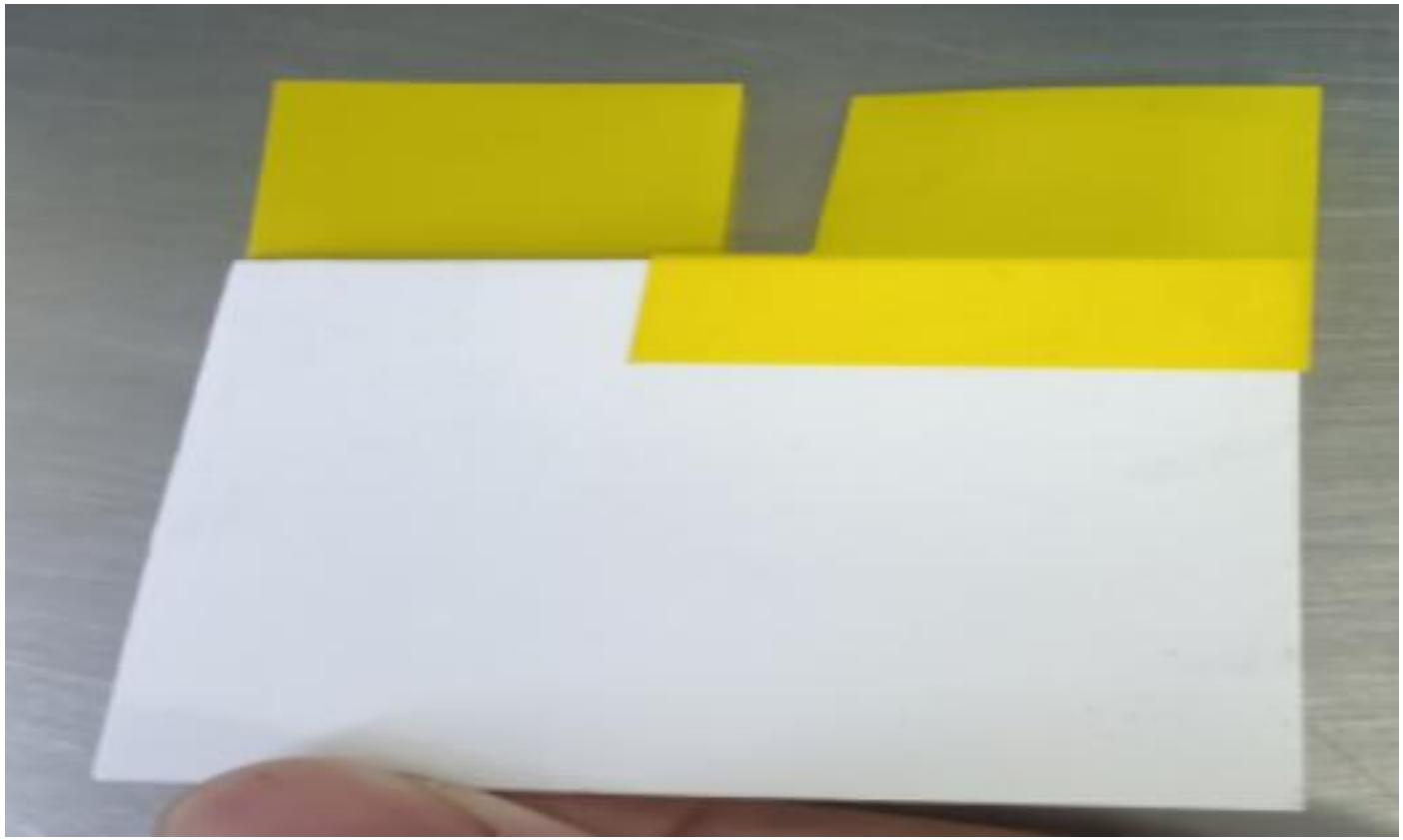


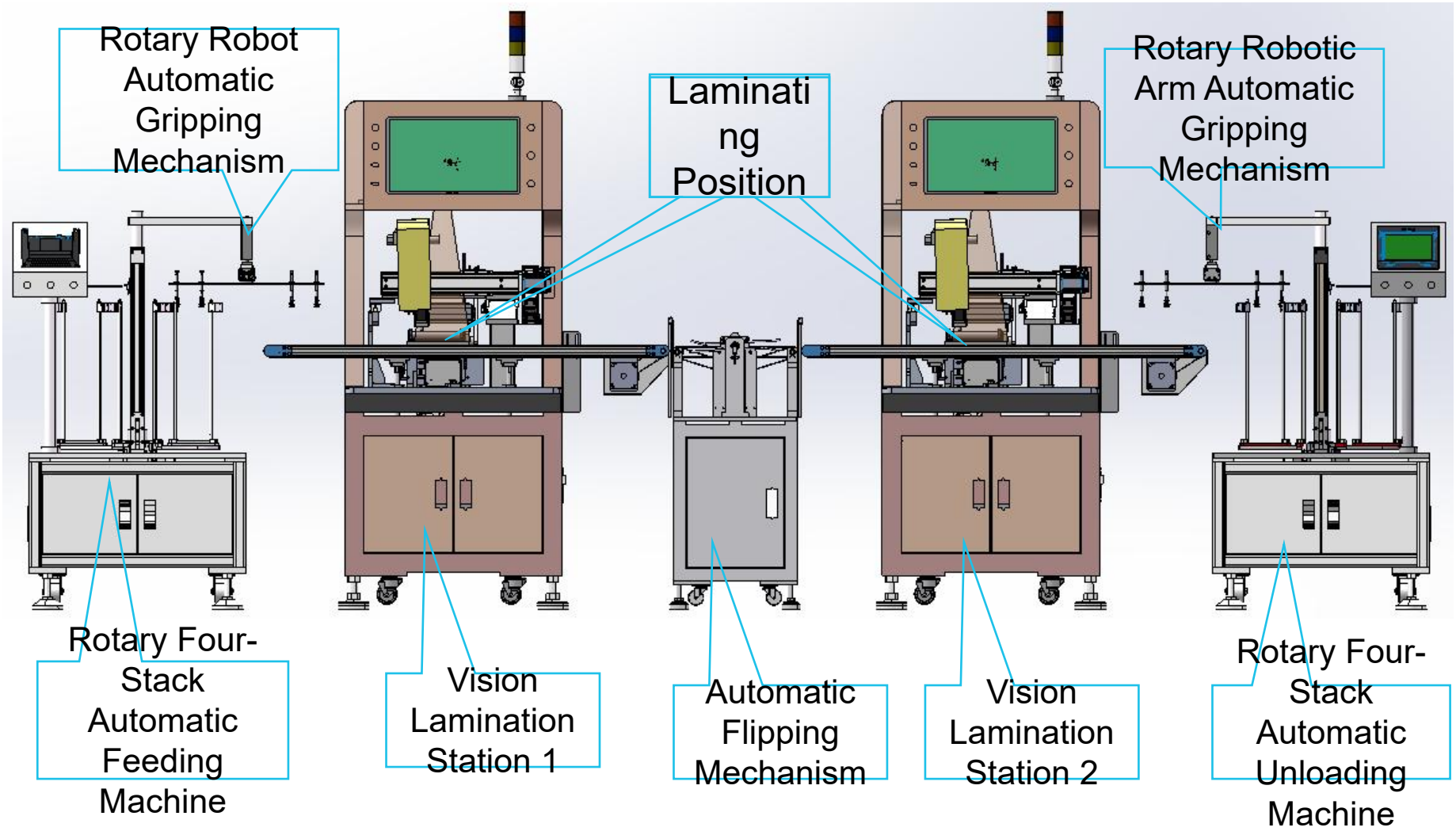
Project Description



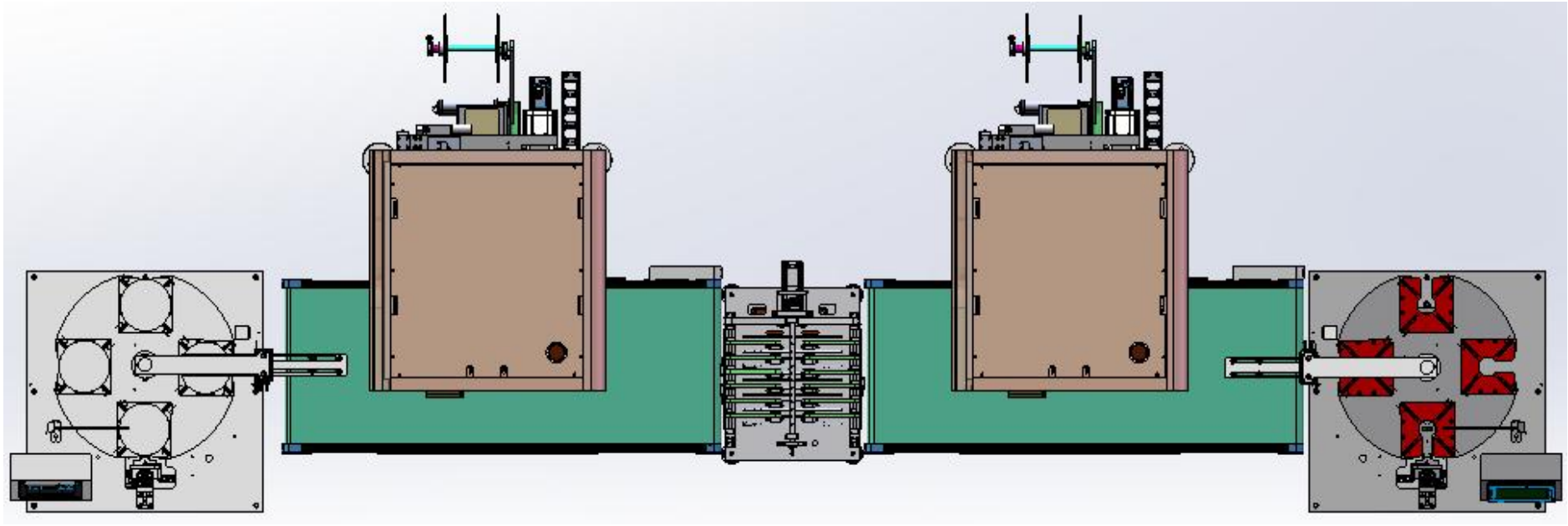
Process Requirements:

Manual loading of bulk materials into the loading bin → robot picks sheets → roll adhesive material feeding → Station 1 performs automatic vision alignment, spider robot automatically picks and places for lamination → product flows out and flips 180° → Station 2 performs automatic vision alignment, spider robot automatically picks and places for lamination → product flows to the unloading position → robot picks the product → finished products collected in the unloading bin.

Project Layout Diagram



Project Flow Diagram



Manual Loading to Four-Stack Bin (Bottom Platform of Stack Rotatable)

Robot Feeds Material to Lamination Station 1 Conveyor

Vision Alignment & Lamination

Flipping Mechanism Rotates Product 180° to Lamination Station 2 Conveyor

Vision Alignment & Lamination

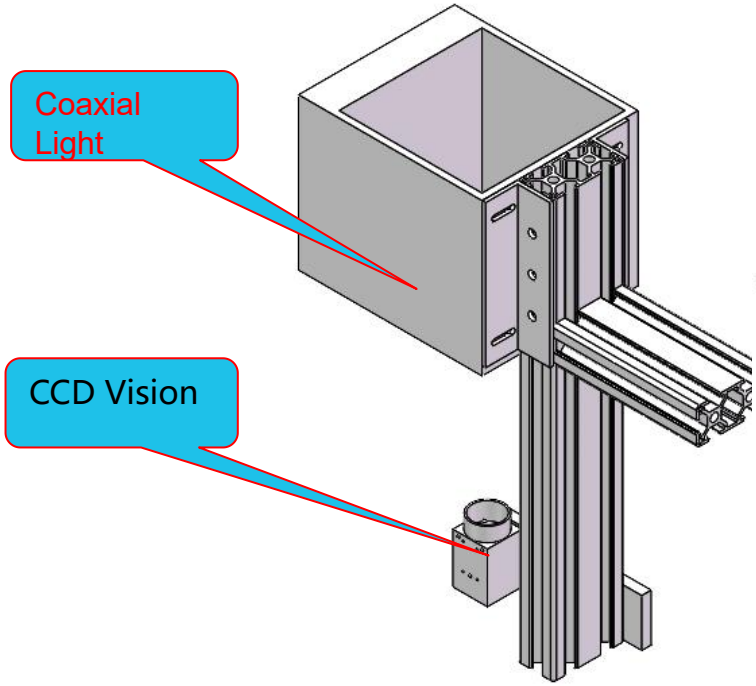
Material Flows to Unloading Stop Plate Position

Robot Unloads Material to Four-Stack Bin (Countable)

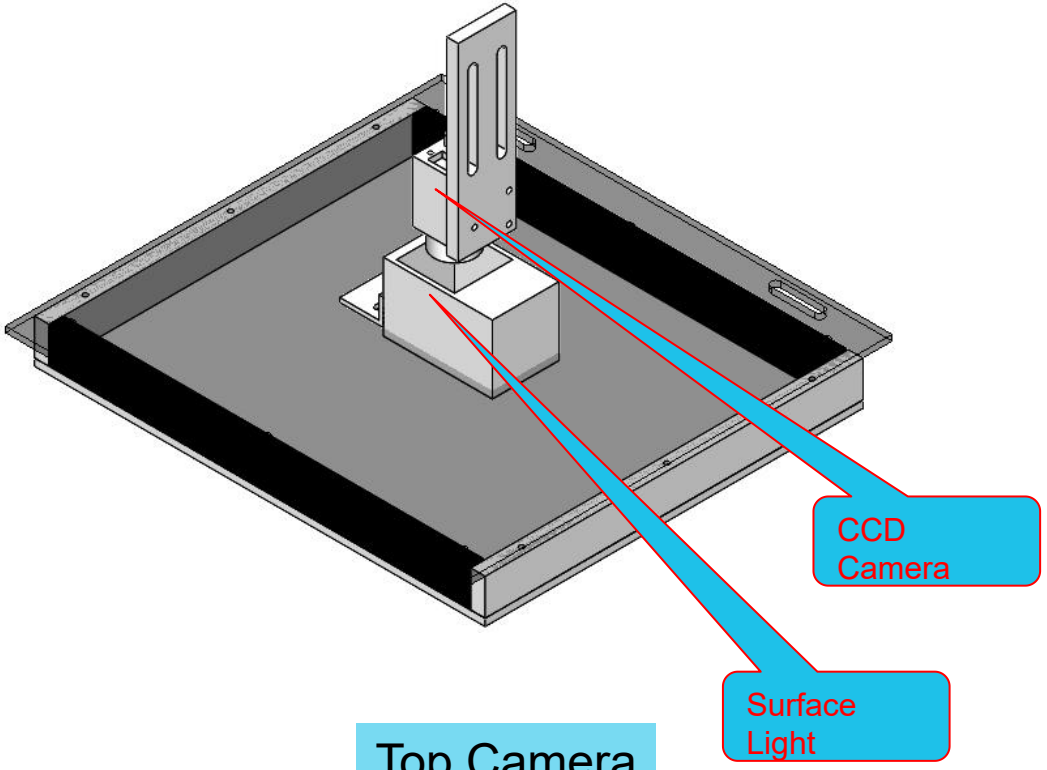
CCD Vision System

CCD Model: Upper camera: 6 MP, resolution 3072×2048
Lower camera: 6 MP, resolution 3072×2048

Industrial Lighting: Upper light: through-hole surface light
Lower light: coaxial light



Bottom Camera



Top Camera

Main Configuration of Vision Labeling Machine

Serial No.	Product Name	Model	Quantity	Brand
1	Motion and Vision Software System	NR--vision4.0	1	In-house Brand
2	CCD Industrial Camera	600W/2000W Pixels	2	Hikvision
3	Integrated Motion Control Card	8-axis	1	In-house Brand
4	Industrial Computer	i512D	1	In-house Brand
5	4-Axis Module	XYZR	1	Airtac Rail
6	Reel Feeder & Label Peeling Machine	NR-QT150	1	In-house Brand
7	Servo Motor	400W/400W	2	Leadshine
8	Stepper Motor	57/42	3	Leadshine
9	Monitor	19.5-inch	1	Bangsuo
10	Belt Conveyor Mechanism	Length 1500mm, Width 400mm	1	In-house Brand
11	Pneumatic Components	Vacuum Generator / Solenoid Valve	1	Airtac
12	Electrical Control	Automatic Brand	1	Custom Non-standard

Project Evaluation

Material Specifications: The loading/unloading machine is compatible with 50–350mm materials. The labeling machine can handle die-cut auxiliary materials within 150×80mm (feed direction—forward or backward—depends on material peeling performance). The labeling machine can accommodate products up to 200×180mm for labeling (top camera field of view: 200×180mm).

Expected Output:

Products within 50–100mm (L×W): 1500–1800 PCS/H

Products within 100–200mm (L×W): 1200–1500 PCS/H

Products within 200–350mm (L×W): 1000–1200 PCS/H

Feeding Success Rate: ≥ 95%

Qualified Rate: ≥ 99.5%

Process Scrap Rate: ≤ 1%

Labeling Accuracy: ±0.2mm

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