



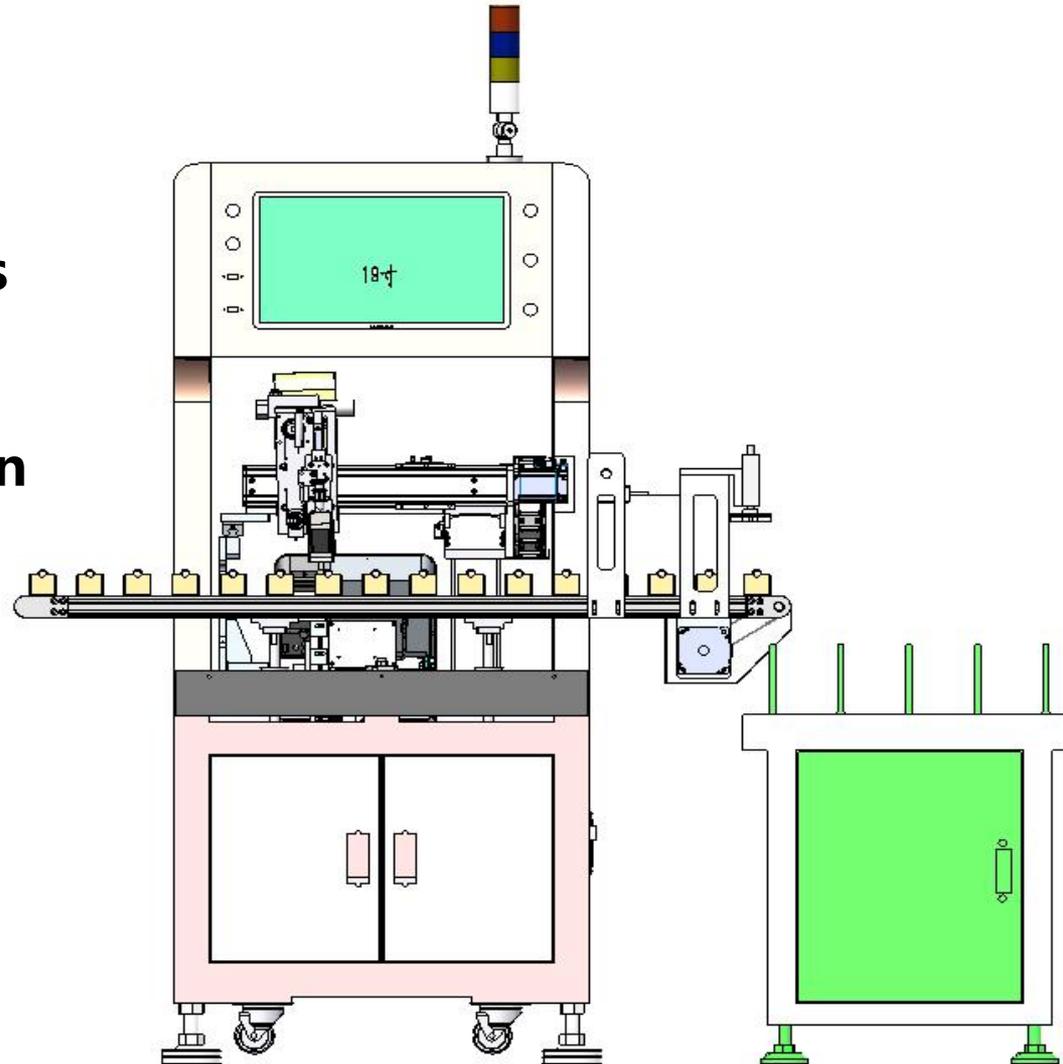
# ALM Automation

Real-time Printing + Scanning + Pressing — Vision-  
Based Labeling Machine

Vision-Based Online Labeling Equipment Solution

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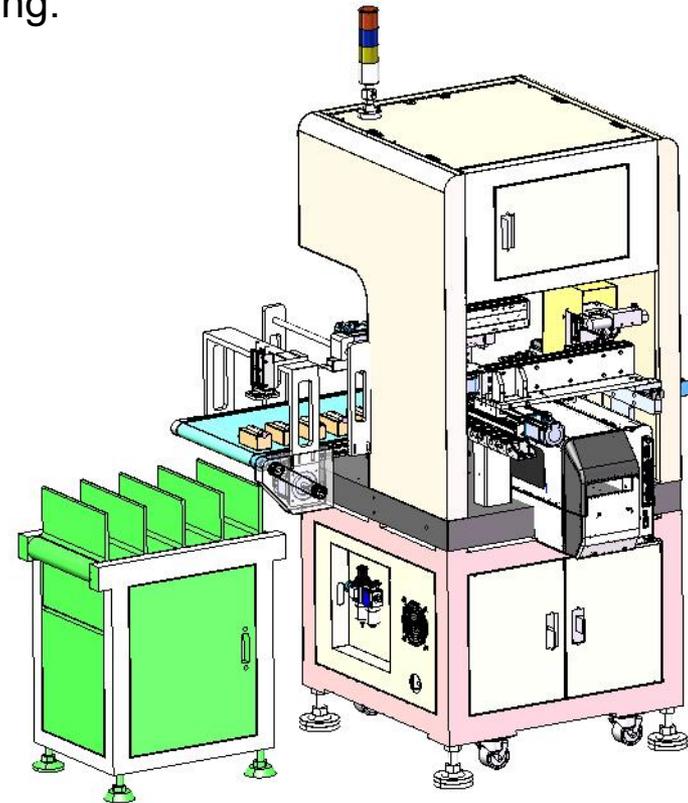
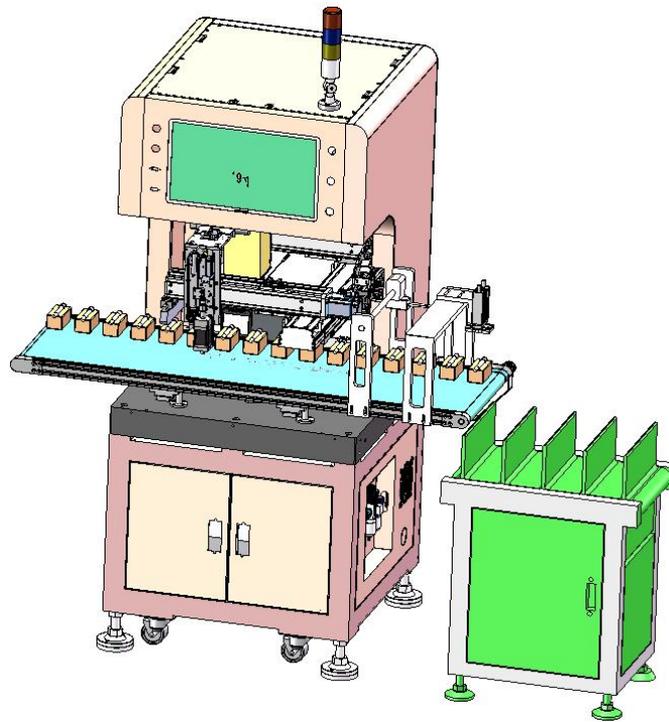
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Visualizations

# Project Description

Manual feeding → System sends command to printer to print and peel labels onto anti-stick plate → Suction nozzle picks up labels and applies onto products → Products pass through barcode scanner, data uploaded to MES (NG scan triggers alarm for manual intervention) → Pressing head applies pressure to secure labels → Materials drop into collection unit with counting function → Manual collection and packaging.

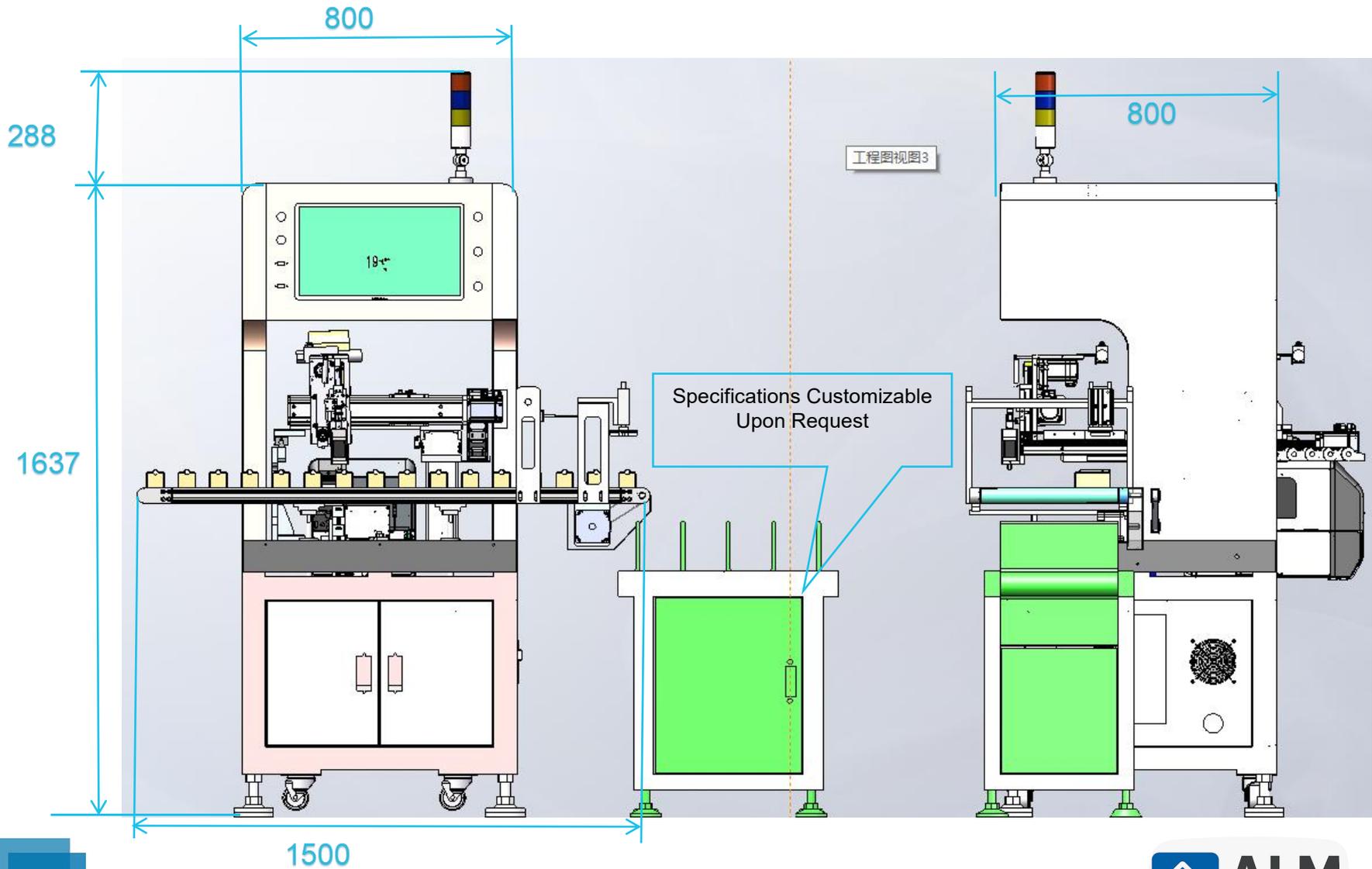


# Equipment Specifications & Advantages

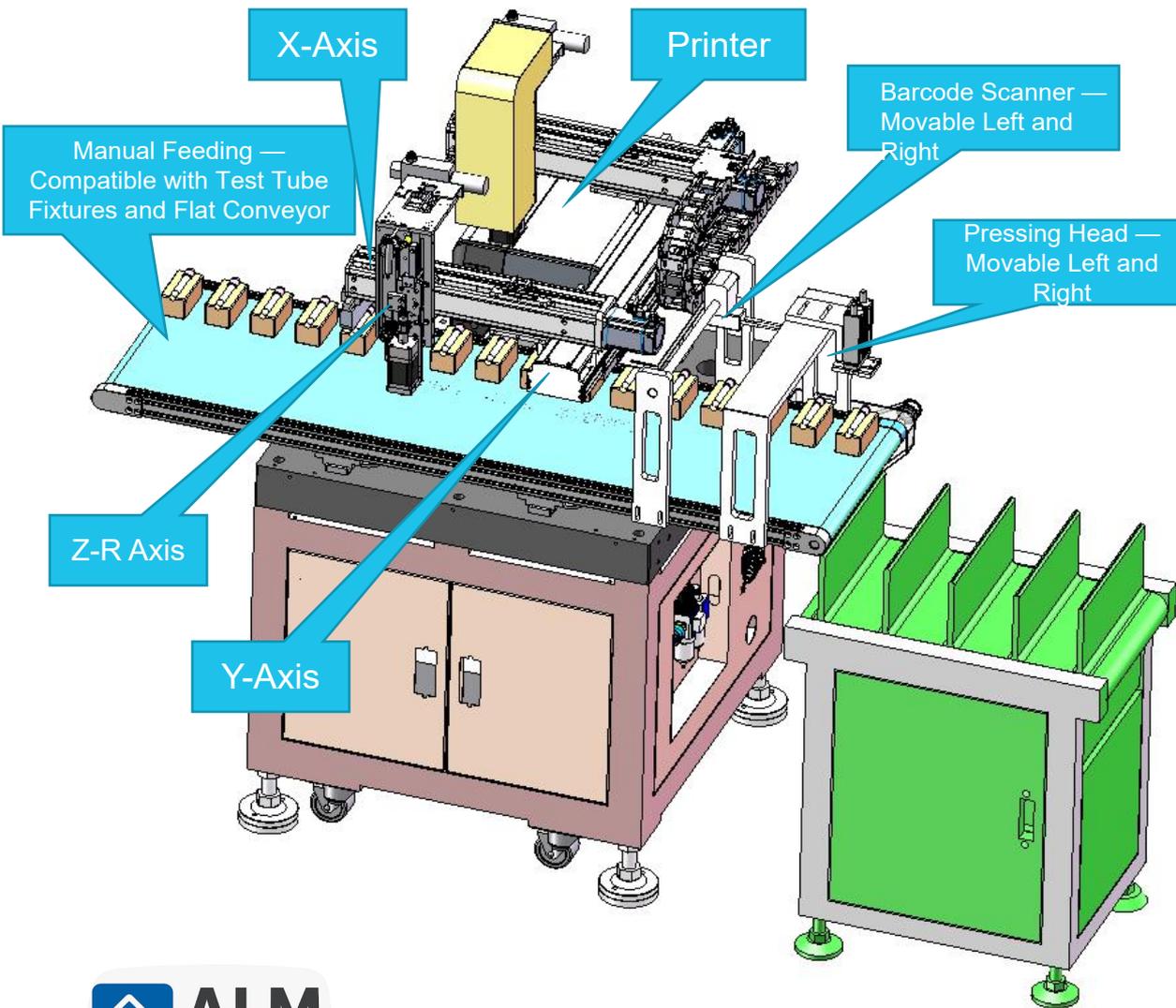
- 1. Equipment Specifications to Meet Customer Requirements
  - Input Voltage: AC 220V, 50Hz
- 2. Working Air Pressure
  - 0.4–0.7 MPa
- 3. Machine Dimensions
  - Overall machine dimensions: see diagram
- 4. Equipment Functions
  - The machine features online label printing with automatic feeding, suction nozzle label pick-up, and a shared fixture and flat conveyor system.
  - It is compatible with round test tubes as well as flat-surface materials.
  - After labeling, barcode scanning and MES data upload are performed to prevent NG scans, missing labels, or data errors.
  - Material collection uses a counting stack-type collection conveyor, allowing manual retrieval and packaging at the end.
- 5. Software Control
  - Proprietary vision alignment and placement software integrated with the motion control system.
  - Interfaces available for MES systems at both ends.
  - Easy-to-learn and user-friendly operation.
- 6. Conveyor Specifications
  - Manual feeding; 350 mm belt conveyor.
  - Inner side: fixed fixtures for round test tubes
  - Outer side: standard flat conveyor for flat materials
  - High versatility improves efficiency and reduces labor.
- 7. Labeling Specifications
  - Labels are printed and peeled by the printer.
  - CCD vision guides placement, ensuring compatibility with the product surface under recognition conditions.



# Project Design — Overall Dimensions Diagram



# Project Design — Overall Machine Operation Flow



1、 Product Loading onto Fixtures or Conveyor

2、 Vision Stop & Labeling Position

3、 Printer: Printing and Label Peeling

4、 XYZR Axis Module — Label Picking

5、 Upper Camera — Photo Capture & Positioning

6、 Lower Camera — Photo Capture & Positioning

8、 Product Label Application

9、 Product Barcode Scanning and Data Upload

10、 Manual Handling of NG (Non-Conforming) Products

10、 Product Pressure Application

11、 Product Pressure Application

**Operation Flow**

# Project Design — CCD Vision System

## CCD Vision System Specifications

CCD Cameras:

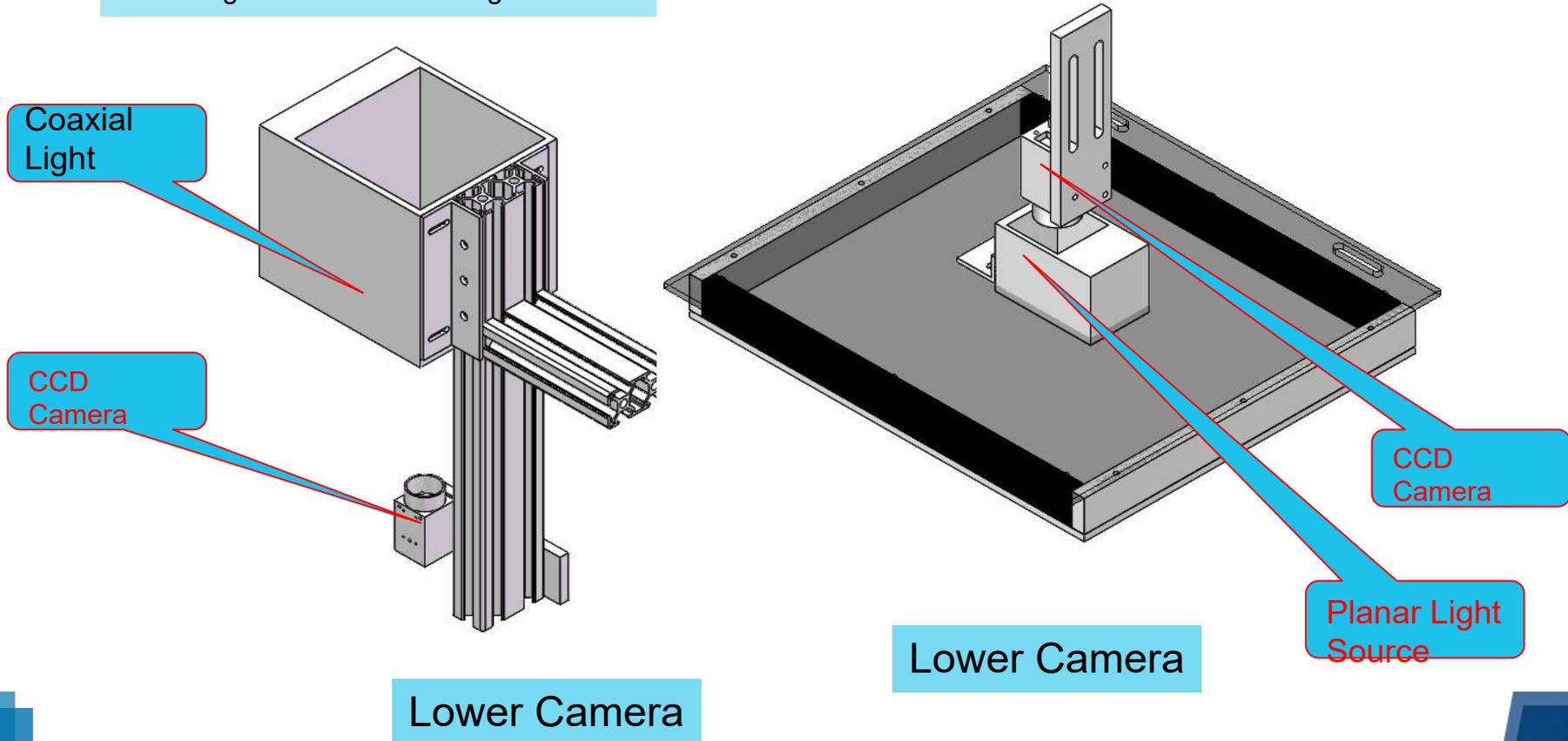
Upper Camera: 20 MP, Resolution: 3072 × 2048

Lower Camera: 6 MP, Resolution: 3072 × 2048

Industrial Lighting:

Upper Light Source: Through-hole planar light

Lower Light Source: Coaxial light



# Project Evaluation — Main Equipment Configuration



No.	Product Name	Model	Quantity	Brand
1	Motion & Vision Software System	NR-vision4.0	1	In-house Brand
2	CCD Industrial Camera	1 × 6 MP, 1 × 20 MP	2	Hikvision
3	Integrated Motion Control Card	8-Axis	1	In-house Brand
4	Industrial PC	i5 12D	1	In-house Brand
5	4-Axis Module	XYZR	1	Airtac Guide Rail
6	Real-time Printer	TBD	1	Sato / Zebra
7	Barcode Scanner	TBD	1	Newland
8	Pressing Mechanism	NR-BY01	1	Custom Design
9	Servo Motor	400W / 400W	2	Leadshine
10	Stepper Motor	57 / 42	3	Leadshine
11	Monitor	19.5-inch	1	Bangsuo
12	Fixture & Belt Conveyor	Length: 1500 mm	1	In-house Brand
13	Pneumatic Components	Vacuum Generator / Solenoid Valve	1	Airtac
14	Electrical Control	In-house Brand	1	Custom Non-standard
15	Discharge Conveyor	NR-XL01	1	Custom Non-standard

## Project Evaluation

1. Estimated Production Capacity: 1500 PCS/H (may vary depending on product specifications)
2. Pick-up Rate:  $\geq 95\%$
3. Pass Rate / Yield:  $\geq 99.5\%$
4. Process Scrap Rate:  $\leq 1\%$
5. Labeling Accuracy:  $\pm 0.1\text{--}0.2\text{ mm}$