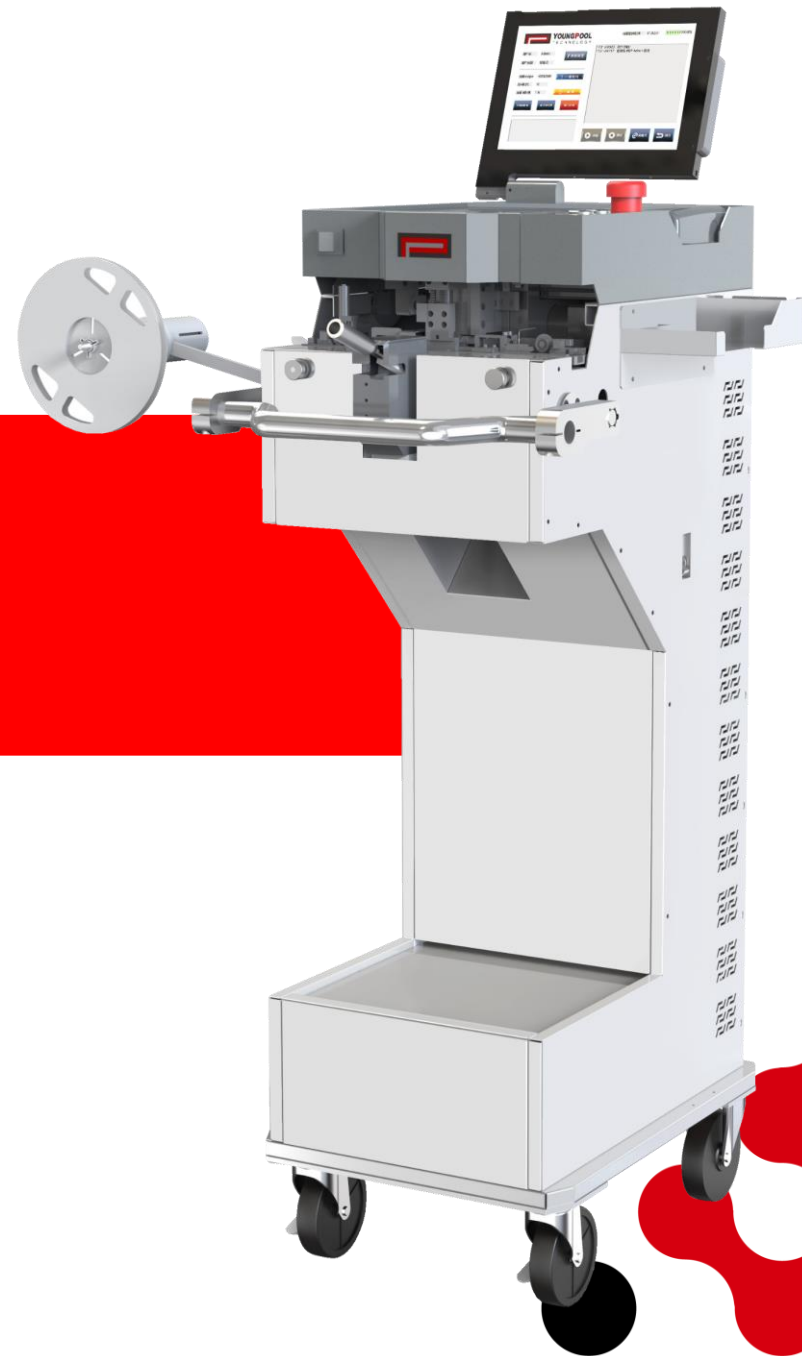


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D-600

**Automatic SMT Splicing
System**



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02 Why Auto Splicing

03 MES Integration

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1. The Company

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Youngpool Technology was established in 2005 in Shenzhen. It has established itself as a reputable distributor and supplier of world-class PCBA equipment including Principals like NORDSON Asymtek, GETECH PCBA Router, and BTU Solder Reflow Ovens. It has leveraged its professionalism and expertise into a recognized solution provider focused on the EMS, telecommunication, semiconductor, automotive, and medical industry sectors. In 2016, Youngpool has invested and established KINGMAX Technology as a subsidiary to independently design, develop, innovate (IDDI) solutions in the Screen Printing and Laser Marking Technologies. Youngpool also set up its own R&D department and successfully developed a series of products in SMT Reel Splicing. We now have established machine installations with equipment that meet and exceed industry standards and serving the most distinguished customers. Taking a pragmatic organization culture, Youngpool strives for excellence and continuous improvement. We are rapidly becoming a prominent solution provider in the electronics industry supported by direct and indirect sales, service, R&D and manufacturing operations.

1. The Company – Key Customers

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vivo

oppo



ZTE中兴

Skyworth
创维

DESAY
德赛

lenovo
联想



SUNWODA
欣旺达

Hytera

JABIL



Great Wall
品质铸就长城

KAIFA

住友電工



2. Why Auto Splicing ?

We bring about improvements yet reducing COST !!!



Reduce Cost

- Reduce Labor
- Save Material
- Reduce SMT machine stoppage

Improve Efficiency

- Shorter Cycle Time vs. manual splicing
- Lesser machine stoppage
- Reduce operator intervention

Improve Quality

- Effect final placement quality
- Fool proof - barcode validation
- Integration with MES allows traceability

Staff Retention

- Operators attend to less non-value added work (machine interrupts)
- Splicing will be much easier and accurate

Enhance Management

- Traceability can be implemented
- Integration to the MES will improve visibility on the shop floor

2. Why Auto Splicing ? Improve Utilization



of Splicing
380 Times

For a typical SMT line, 8mm splicing takes place 380 times per day

Reduced Interrupts

64 mins

Assuming 30s to clear an interrupt.

$$380 \times (99 - 65\%) \times 30 = 3876s$$

Manual Splicing FPY

65%

Typical FPY% of manual splicing

\$\$\$ Savings

US\$ 378

Assuming 250,000 placement per hour, \$0.00142 per placement, increase \$378 worth of capacity per line per day

Auto Splicing FPY

99%

we have customers that can achieve 99% FPY with our equipment

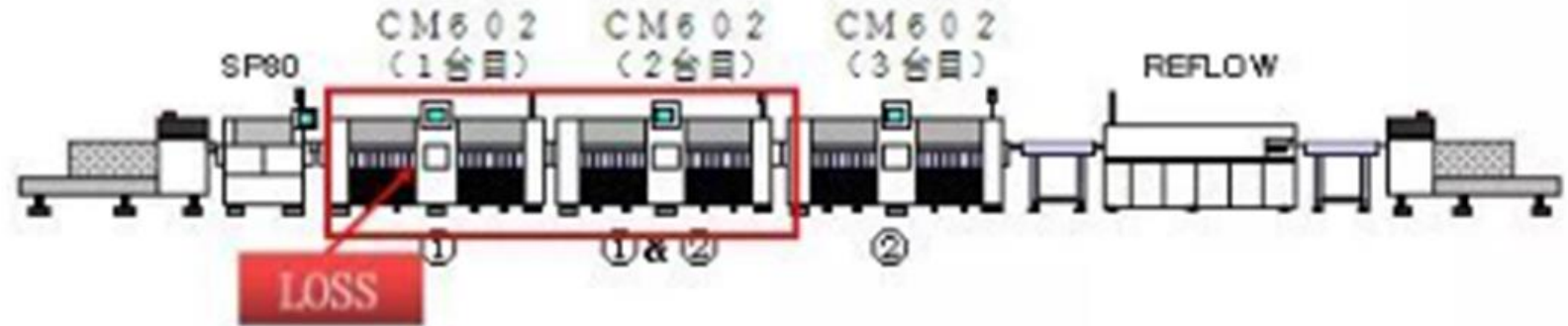
ROI

In 92 Days

2. Why Auto Splicing ? Improve Efficiency & Quality

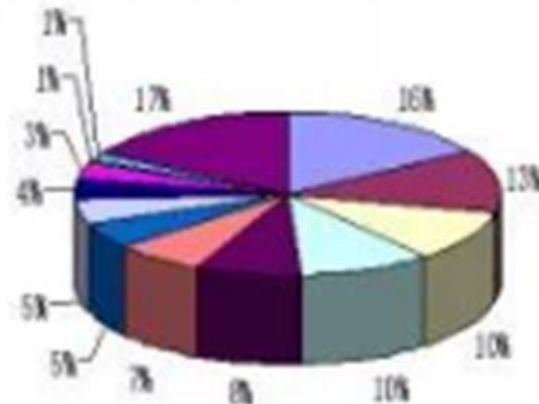
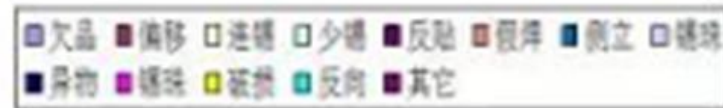
Efficiency :

When splicing FPY is low (less than 80%) causing interrupts across the SMT line, the whole production line will sustain product loss



Defects :

Typical quality issues with poor splicing (non-ideal pick position for pick-and-place equipment)



Missing Component



Placement Shift



Tomb Stone

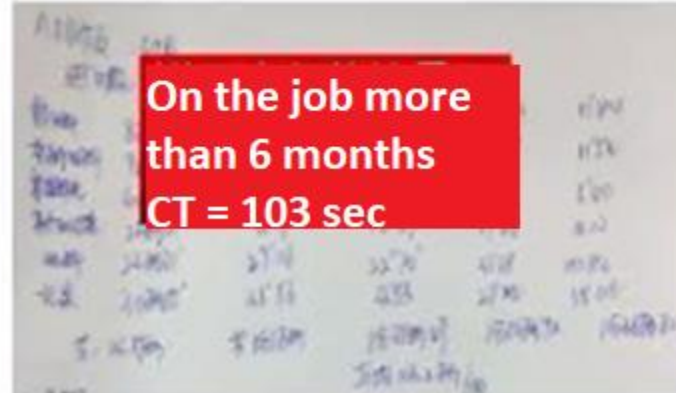
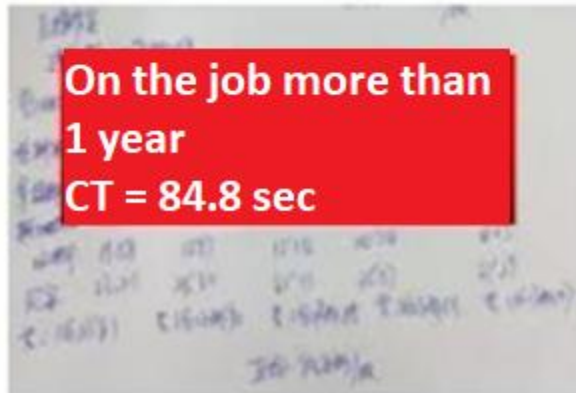


2. Why Auto Splicing ? Reduce Manpower

Typical cycle time for 8mm tape splicing at a customer in China

NO	接料步骤	工具	🕒 C/T = 84.8 SEC				
1	剪切旧料空料带	人工	10.67				
2	剪切旧料空料带			9.62			
3	拿接料片				3.42		
4	新旧料驳接 Actual Splicing					14.23	
5	收料						15.29
6	记录接料信息						

Data from Customer A



2. Why Auto Splicing ? Reduce Manpower

Item / Description	Manual Splicing	Automatic Splicing System	Effects
Cycle Time (sec)	84.8	41.1	50% efficiency improvement
Typical First Pass Yield %	65%	98%	50% less interrupts
Defects After Reflow Soldering	0	0	Outgoing quality assurance
Validation and Traceability	Manual	If validation fails, machine will stop. Traceability possible via integration into MES	Eradication of human errors and enhancement on quality

Net result : **REDUCTION** of manpower requirements

3. MES Integration

Typical MES *(I can't find a good schematic to describe the MES, if you have please send to me)*



Benefits of integrating automatic tape splicing into MES

- **Foolproof against operator errors**
 - Validation of new reel
 - Obtain real-time data on Feeder Serial #, part # of new and old reels via barcode scanning
 - Safeguard outgoing quality
- **Real-time Information**
 - Wireless transmission of splicing data to MES
- **Exchange of data with Pick-and-Place equipment**
 - Fore warning on soon-to-be depleted reels
- **Reduce wastage**
- **Barcode printing**
- **Compatible to IPC-CFX-2591 protocol**

4. The D-600 Automatic Splicing System

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Highlights

Stability and Reliability :

- First Pass Yield of 98%
- Battery powered for 12-15 hours operation

Compatibility :

- Support Paper & Embossed tapes
- Accommodate different tape thicknesses
- Accommodate different reel sizes
- Integration to existing MES

Ease of Use :

- Intuitive graphic interface
- Minimal training required

Ergonomic :

- Compact size
- Optional power-assisted wheels to facilitate movement



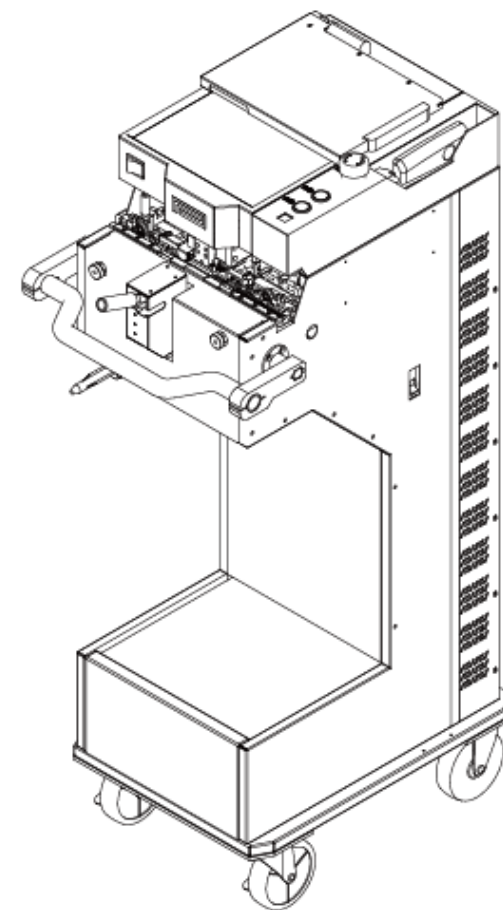
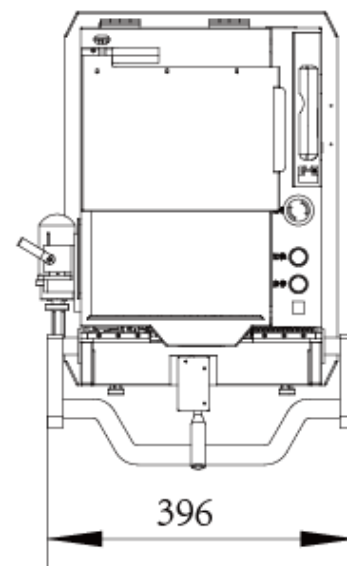
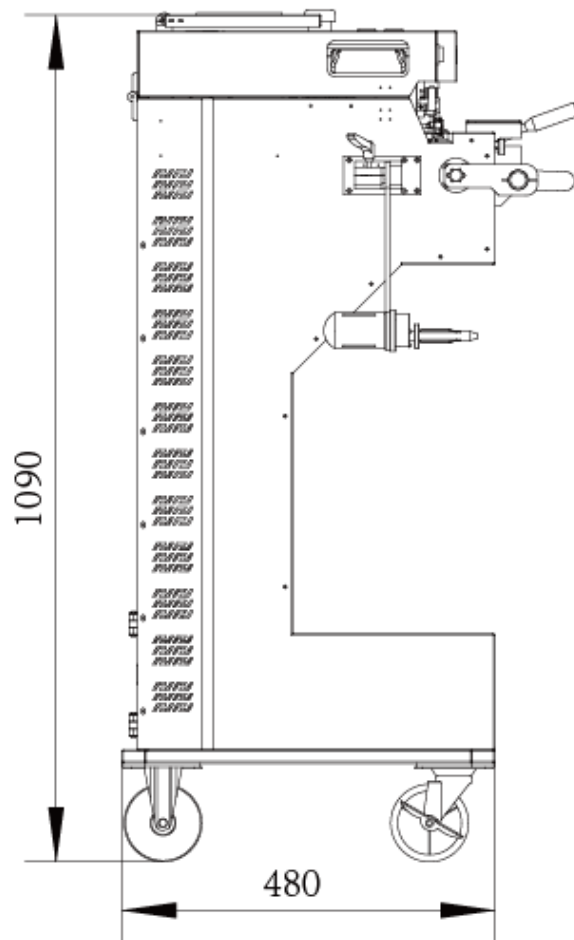
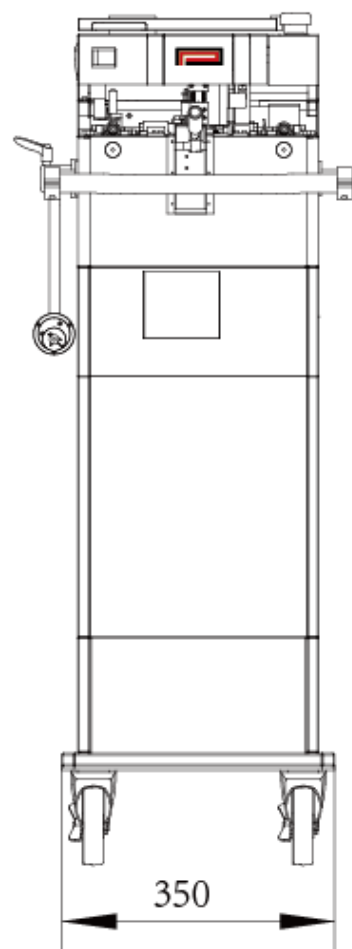
5. Technical Data

Applicable Material : 8mm Paper / Embossed Tape and Reel (thickness between 0.25-1.3mm)

* Applicable on 99% of 8mm component tape (please consult us for special applications)

	D-600		
Repeatability (mm)	0.05	Power	60 Ahr DC24V Battery
Positioning Accuracy (mm)	±0.1	Operation Time (when fully charged)	12~15h
Tape Width (mm)	8	Barcode Printer	Optional
Reel Winding	Standard	Barcode Scanner	Standard
Reel Size (mm)	≤ φ380	USB 2.0	3
Typical Cycle Time (sec)	6-8 sec (not including loading time)	Wi-Fi	Standard
Control	Industrial Computer	Bluetooth	Optional
Operating System	Windows Based	Ethernet	Standard
MES	Customizable	Weight (kg)	55
Information Displayed	Barcode information, Battery Status, Alarms, Settings & Parameters	Dimensions	334(W) x 549(L) x 1121(H)
Safety	Fully Enclosed with Interlock switches		

5. Technical Data - Dimensions



To Achieve 98% First Pass Yield

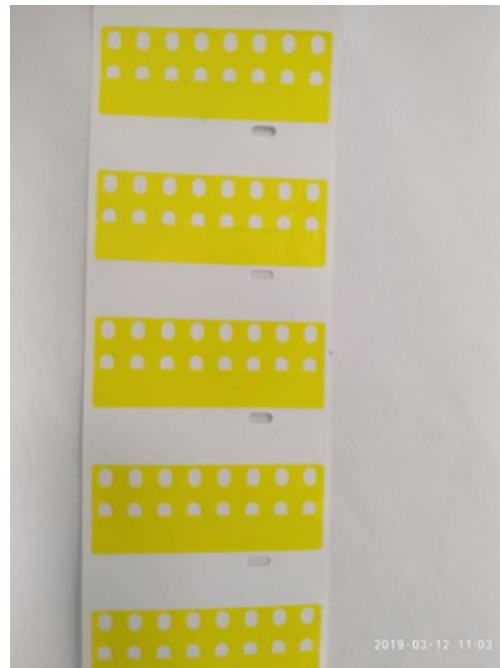
Key Strengths

1. Proprietary Adhesive Formula (exceptional adhesive and shear strength)
2. Precision Positioning and Cutting Mechanism
3. Fiber Optic Sensing System to detect empty pockets

6. Strengths of the D-600

I. Proprietary Adhesive Formula

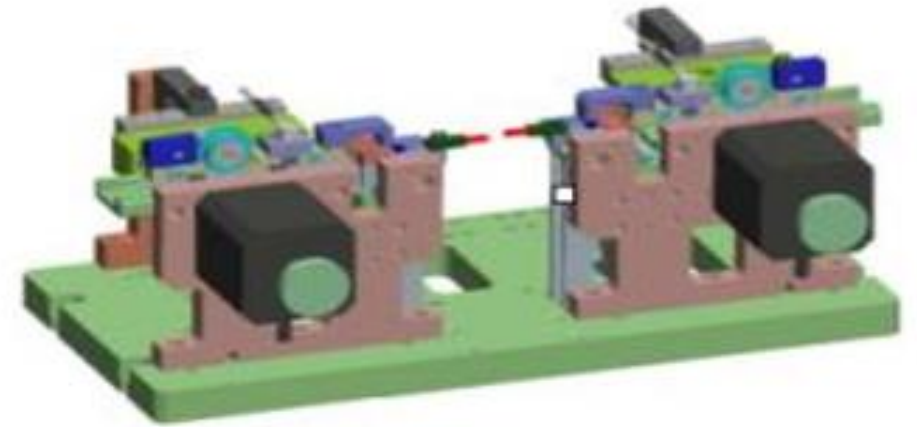
	Youngpool Proprietary Splicing Tape (pressure sensitive adhesive)	Off the shelf splicing tape in the market	Remarks
Adhesion Strength	30N / 25mm ²	20N / 25mm ²	This is crucial to the integrity of the joint of two carrier tapes. Weak adhesion will cause feeder jam or mis-pick
Shear Strength	10 – 12N	6 – 10N	This is crucial when the feeder peels off the mylar during feeding. A weak shear strength will cause breakage of the mylar at the joint



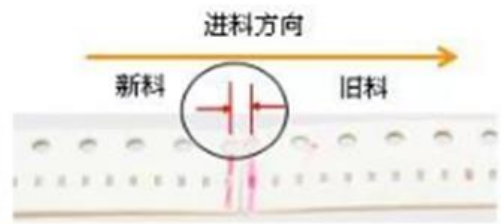
6. Strengths of the D-600

II. Precision Hardware

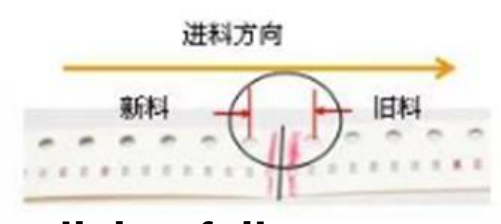
D-600 Precision Hardware can maintain position accuracy of carrier tape end at $\pm 0.1\text{mm}$



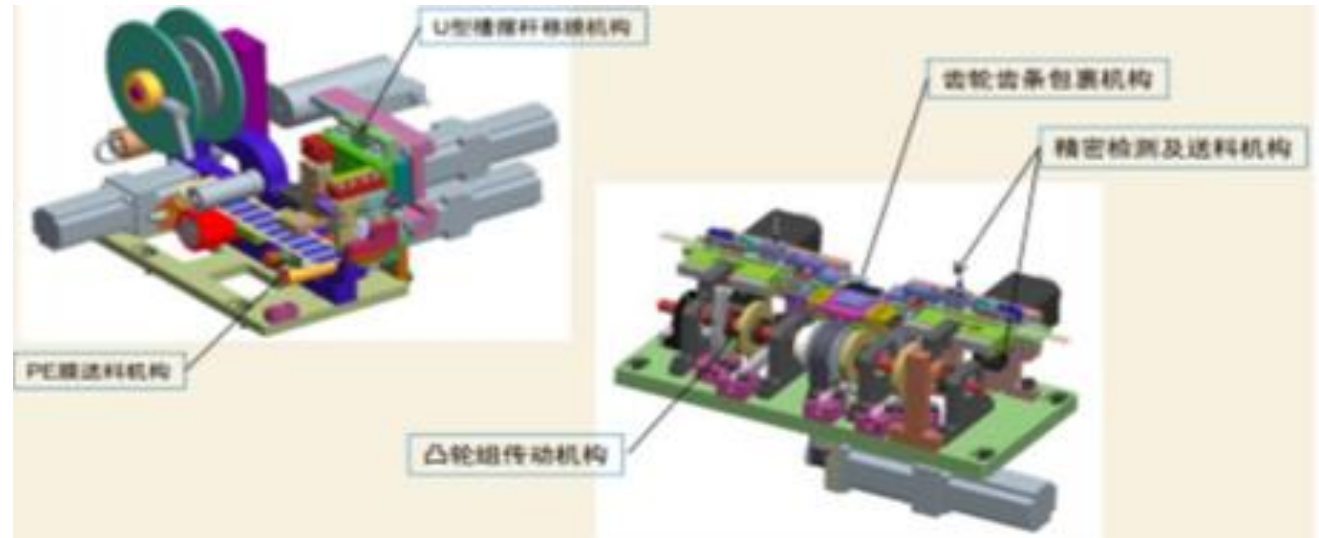
Failure Mode #1
Locating holes distance smaller than 4mm



Failure Mode #2
Locating holes distance greater than 4mm



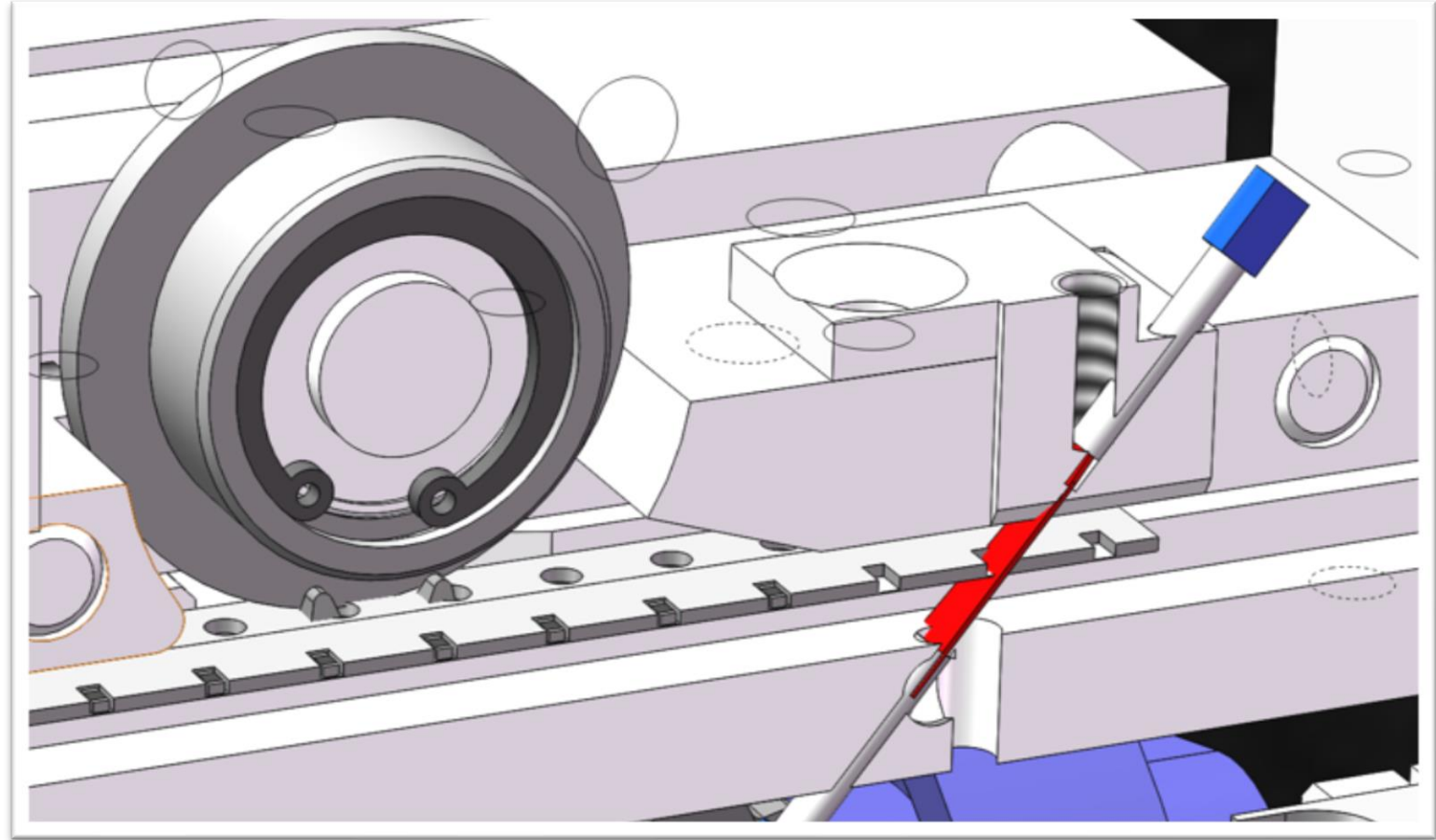
Typical manual splicing failures






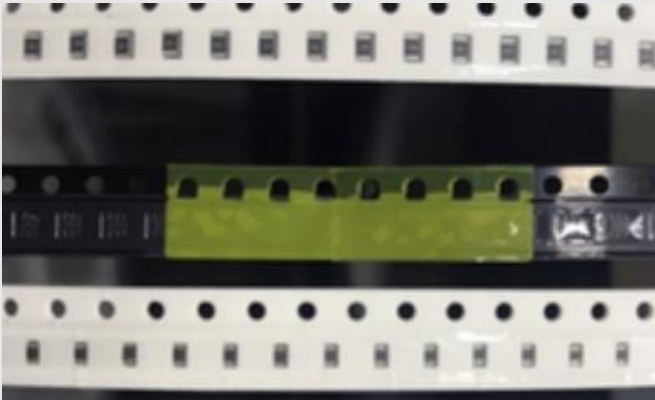
6. Strengths of the D-600

III. Optical Sensors

- D-600 Optical Sensors (on one each side) can detect empty pocket on the carrier tapes.
- Cutting will occur after the pocket with a detected component, therefore, no need for a tape leader with empty pockets for splicing on the machine



7. D-600 Auto Splicing vs Manual Splicing

	Paper Tape	Embossed Tape
Manual	 A close-up photograph showing two white paper tapes with black punch holes being joined by a yellow adhesive strip. A person's finger is visible on the left side, holding the tapes together.	 A close-up photograph showing two white embossed tapes with black punch holes being joined by a yellow adhesive strip. The tapes are held together by a person's finger on the left.
D-600	 A close-up photograph showing two white paper tapes with black punch holes being joined by a yellow adhesive strip. A person's finger is visible on the left side, holding the tapes together.	 A close-up photograph showing two white embossed tapes with black punch holes being joined by a yellow adhesive strip. The tapes are held together by a person's finger on the left.

7. D-600 Auto Splicing vs Manual Splicing

Manual Splicing Issues



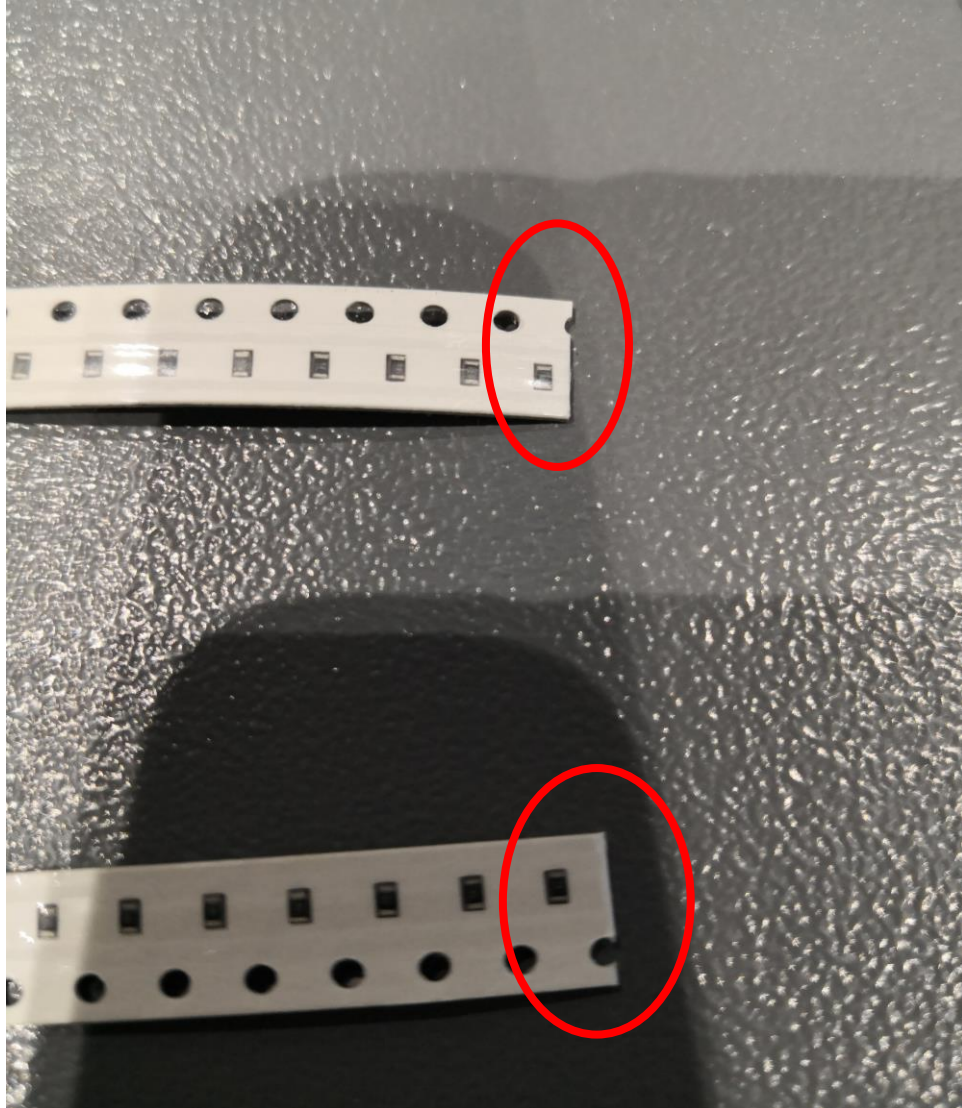
NO Pre-cut is error prone



NO Inconsistent performance



7. D-600 Auto Splicing vs Manual Splicing



- **Pre-cutting is extremely easy, we do not require precise pre-cutting on both old and new tapes (see picture)**
- **NO JIG is required for pre-cutting**
- **As a result, the whole splicing operation can be performed with shorter cycle time**

8. Case Study – A customer

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8. Case Study – A Customer

At one of our customer in China
FPY @ 99.47%

Date	Number of Splicing with D-600	Interrupts	Remarks
5 Sep PM	47	1	Feeder jam at joint
6 Sep PM	50	1	Feeder jam at joint
7 Sep PM	45	0	
8 Sep (all day)	81	0	
11 Sep (all day)	85	0	
12 Sep (all day)	74	0	



9. Conclusions

Advantages of D-600 Automatic Splicing System

- 1. 98% (or above) First Pass Yield**
 - Proprietary Adhesive Formula**
 - Precision Hardware (positioning and cutting)**
 - Optical Component Sensing to reduce wastage**
- 2. Empty Pocket Detection (no leader tape required)**
- 3. Allow integration with MES**
- 4. Barcode validation prior to splicing**
- 5. 12 – 15 hours of continuous operation with battery**
- 6. Ergonomic features such as optional power-assisted wheels and motor-driven reel winder**
- 7. Intuitive Graphic Interface**
- 8. Minimal training for operators thus addressing staff turn-over**