

CSE Round Lighting check and FI AOI

Version: V1.4

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客户需求

Customer Requirement 

Machine background

capacity : 设备产出 > 85K / day (Output > 85K/day)

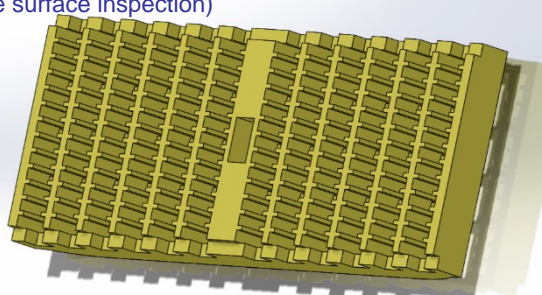
machine position : CSE 1 #

制作一台AOI设备代替人工检测，采用单排吸笔，将产品从篮子内吸取出来，放置在中转皮带上，完成后进行AOI检测，检测完将OK品放入白色下料托盘中

(Build an AOI machine to replace manual inspection. Use single-row suction pen to pick up products from basket, place on transfer belt, perform AOI inspection, and put OK products into white unloading tray.)

设备难点： (Equipment Challenges:)

- 1. 浅色泄露 (Light color leakage)
- 2. 侧面检测 (Side surface inspection)





检测报告

Testing Report 

Testing Report



NO.	Defect Type	Defect item	Sample Q'ty	Detectable Q'ty	Detectable
1	Function	1、Lighting Check	20	20	OK
2	Function	1、Crack	3	3	OK
3		2、Broken	2	2	OK
4		3、Epoxy Exposal	1	1	OK
5		4、Pin Missing	1	1	OK
6		5、Electrical contamination	1	1	OK
7		6、Gold exposal	1	1	OK
8		7、Insufficient Epoxy	1	1	OK
9		8、Epoxy overflow	0	0	base on real sample
10		Cosmetic	1、Dyeing contamination	1	1
11	2、Non-Electrical contamination		1	1	OK
12	3、No code		1	1	OK
13	4、Code blur		1	1	OK
14	Assembly	1、Pin bent	1	1	OK
15		2、Pin oxidized	1	1	OK
16		3、Pin bur	0	0	base on real sample
17		4、Pin mis-cut	0	0	base on real sample
18		5、Epoxy higher than ceramic	1	1	OK
19		6、Misalignment	1	1	OK

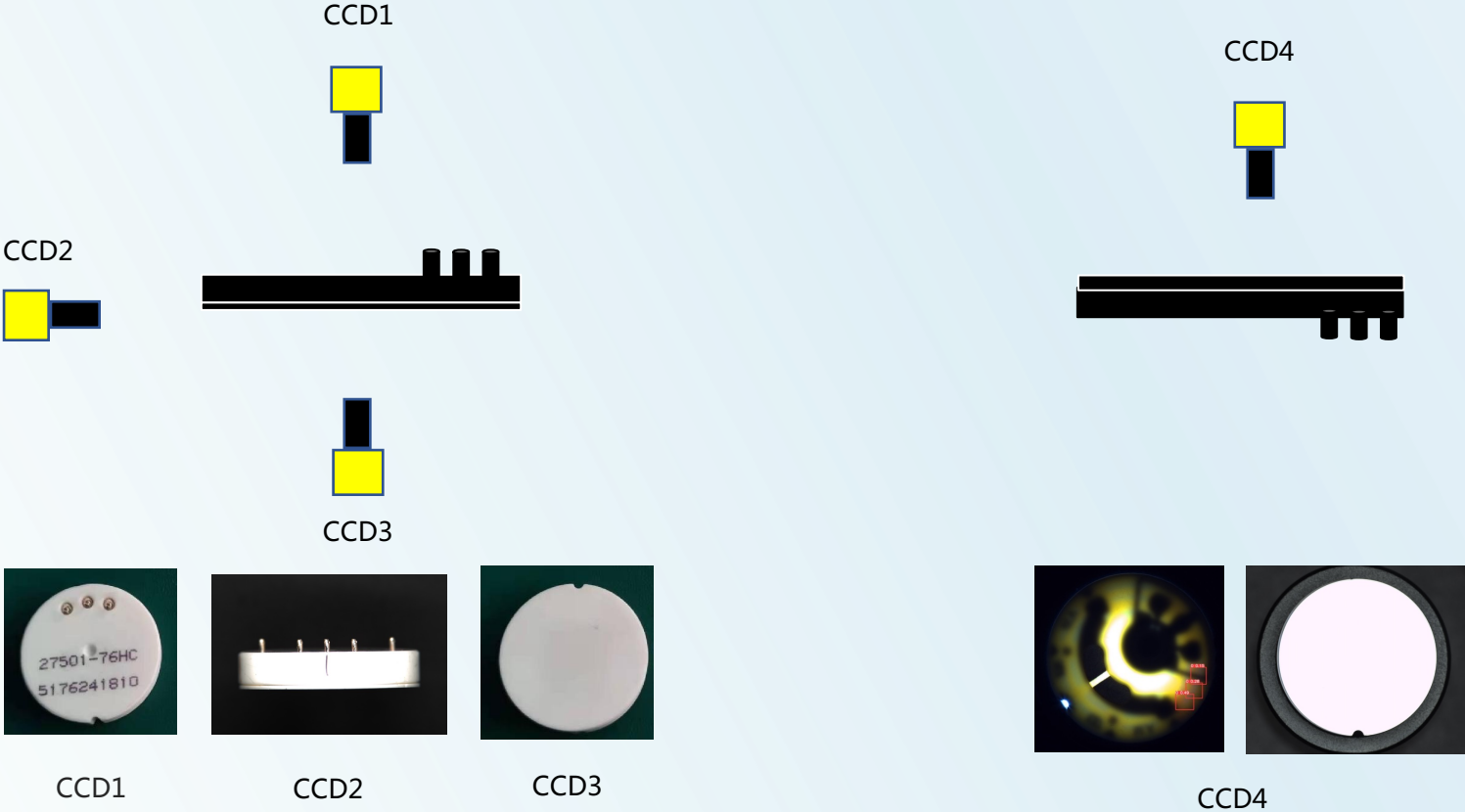
Inner Staining Residue			
defect type	Sample ID	Image	Algorithm
Staining on edge	1#	OK	OK
	2#	OK	OK
	3#	OK	OK
	4#	OK	OK
	5#	OK	OK
	6#	OK	OK
	7#	OK	OK
	8#	OK	OK
	9#	OK	OK
	10#	OK	OK
Yellow glass cement	1#	OK	OK
	2#	OK	OK
	3#	OK	OK
	4#	OK	OK
	5#	OK	OK
	6#	OK	OK
	7#	OK	OK
	8#	OK	OK
	9#	OK	OK
	10#	OK	OK

Critical defects

Based on samples provided
 Detection rate: 100%

➤ Visual Systems for defects

CCD#1-Top side check & CCD#2-Side check & CCD#3-Bottom side check & CCD#4-Inner check

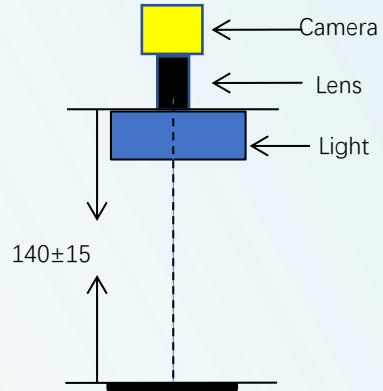


- CCD#1,#3:**
 - Top side check
 - Bottom side check
 - Misalignment
- CCD#2:**
 - Side check & PIN check
- CCD#4:**
 - Inner check

Note :
Pin exist on top side.

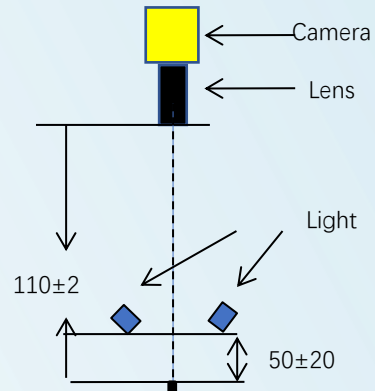
➤ Visual Systems Deploy

CCD#1-Top side Check & CCD#2-Side check & CCD#3-Bottom side check & CCD#4-Inner check



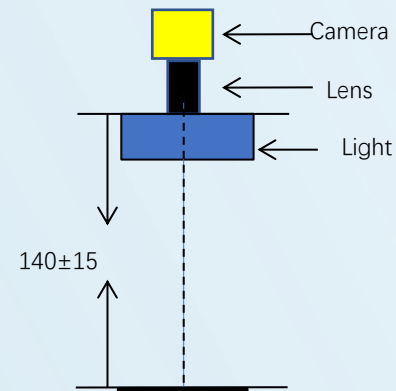
Camera	MV-GE501GC * 4
Lens	WWK03-110-230 * 4
Light	DN-COS60-W * 4
System Resolution	0.0115mm/pixel
FOV (mm)	28*24
WD (mm)	140±2

CCD1



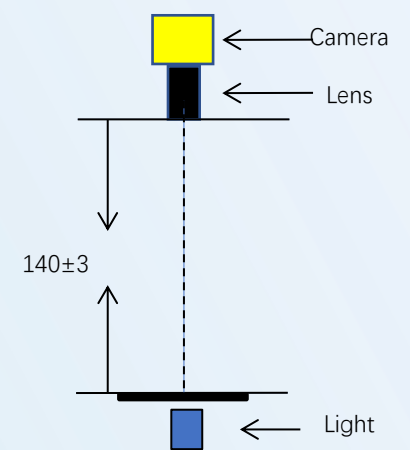
Camera	MV-GE501GC * 4
Lens	WWK03-110-230 * 4
Light	DN-2BS32738-W * 4
System Resolution	0.0115mm/pixel
FOV (mm)	28*24
WD (mm)	110±2

CCD2



Camera	MV-GE501GC * 4
Lens	WWK03-110-230 * 4
Light	DN-COS60-W * 4
System Resolution	0.0115mm/pixel
FOV (mm)	28*24
WD (mm)	140±2

CCD3



Camera	MV-GE2000C-T1P-C*4
Lens	DTCM110-48*4
Light	DN-HSP25-W-4
System Resolution	0.0069mm/pixel
FOV (mm)	37.9*25.3mm
WD (mm)	140±3

CCD4

03

CONTENTS

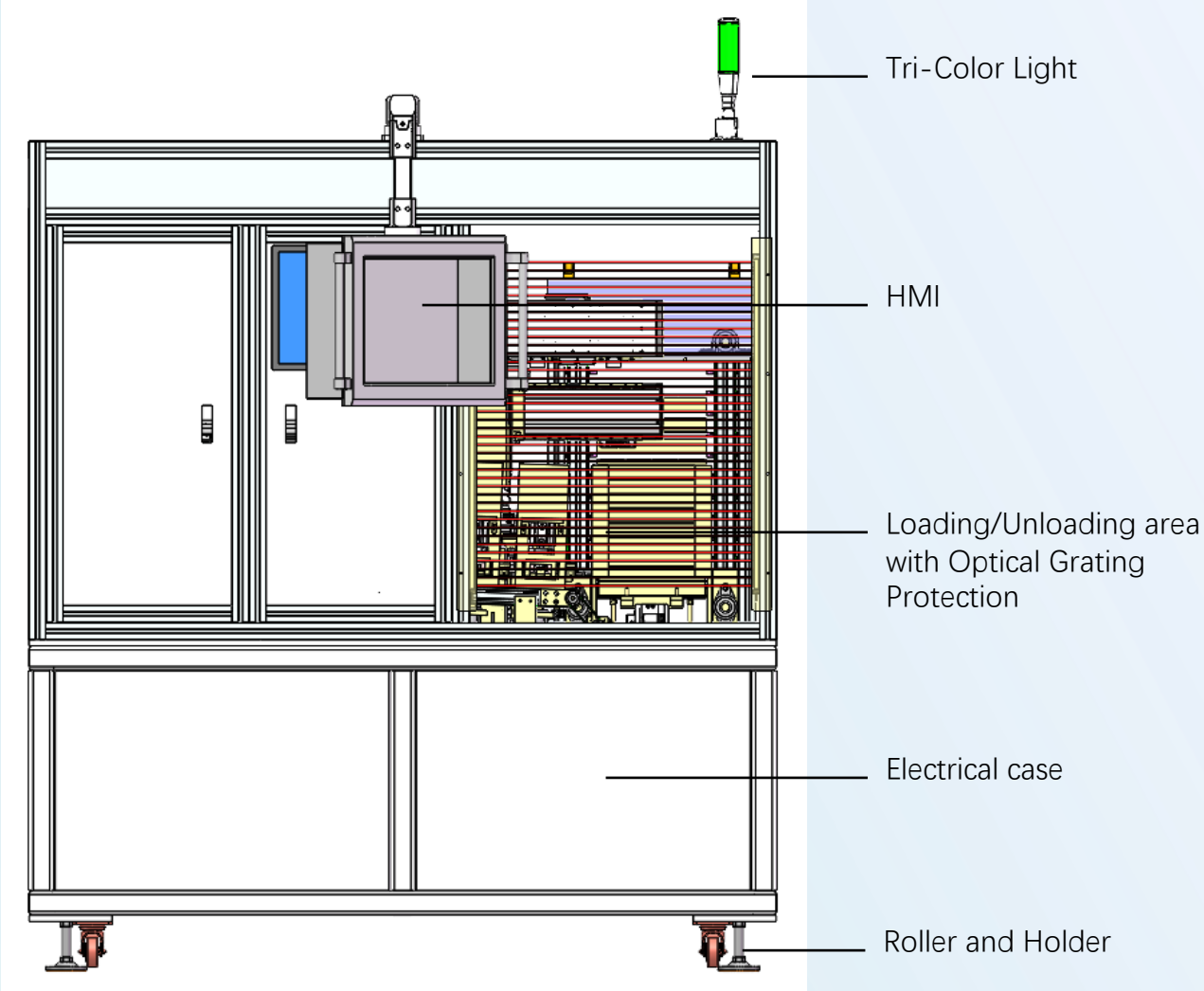
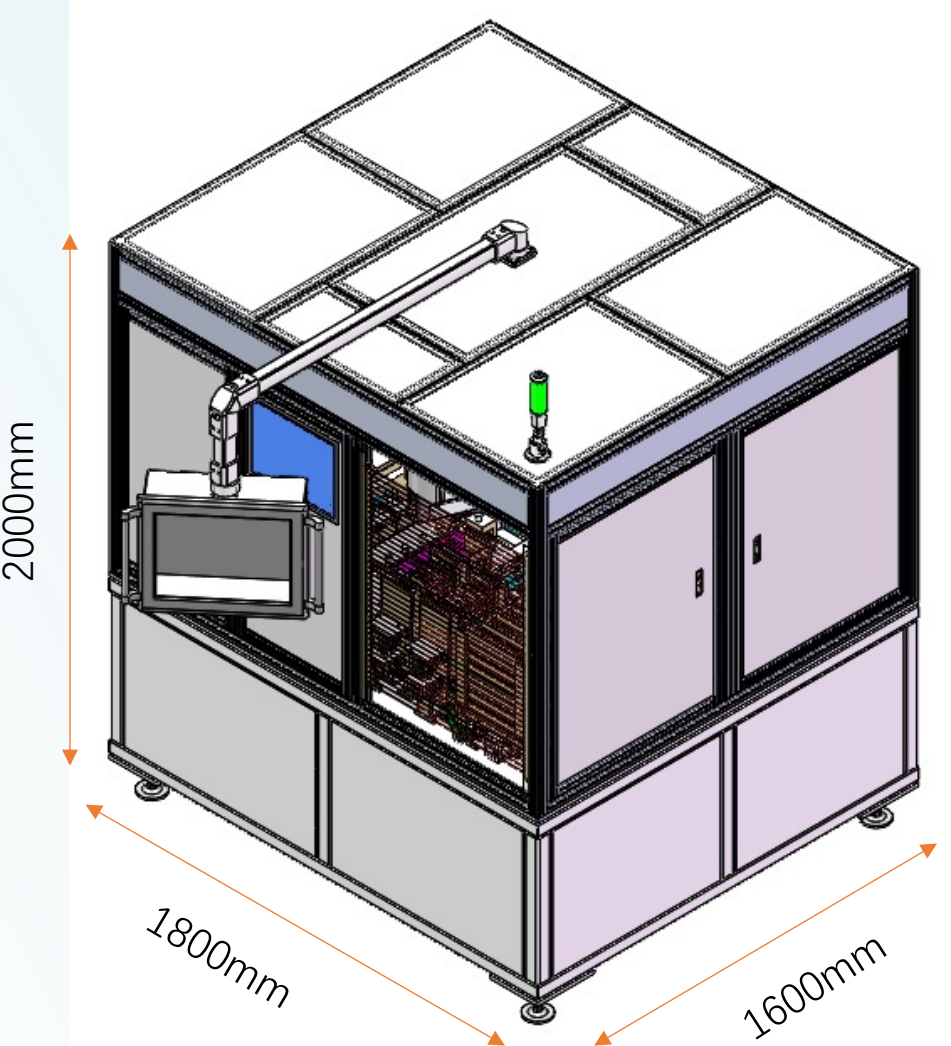


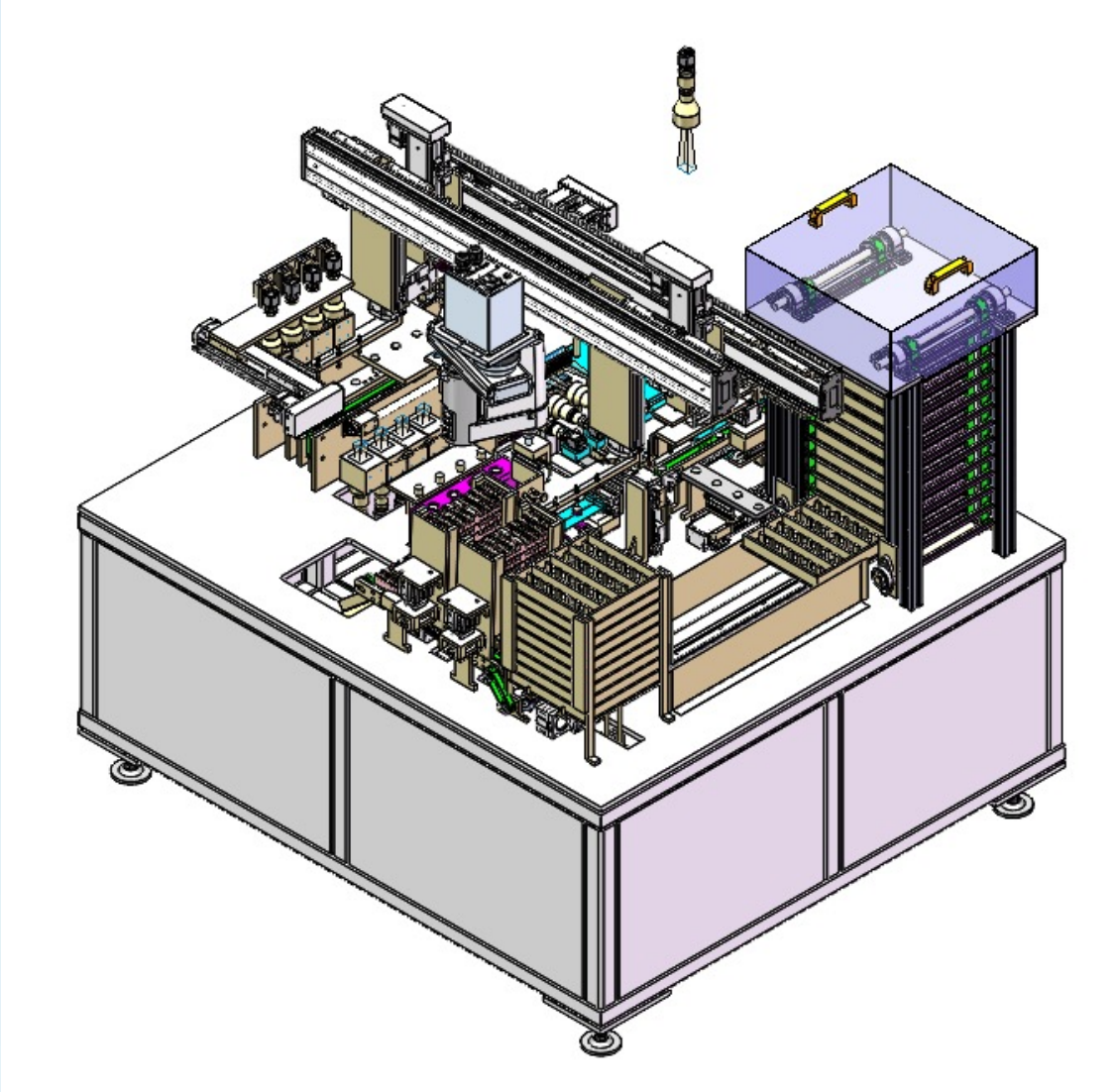
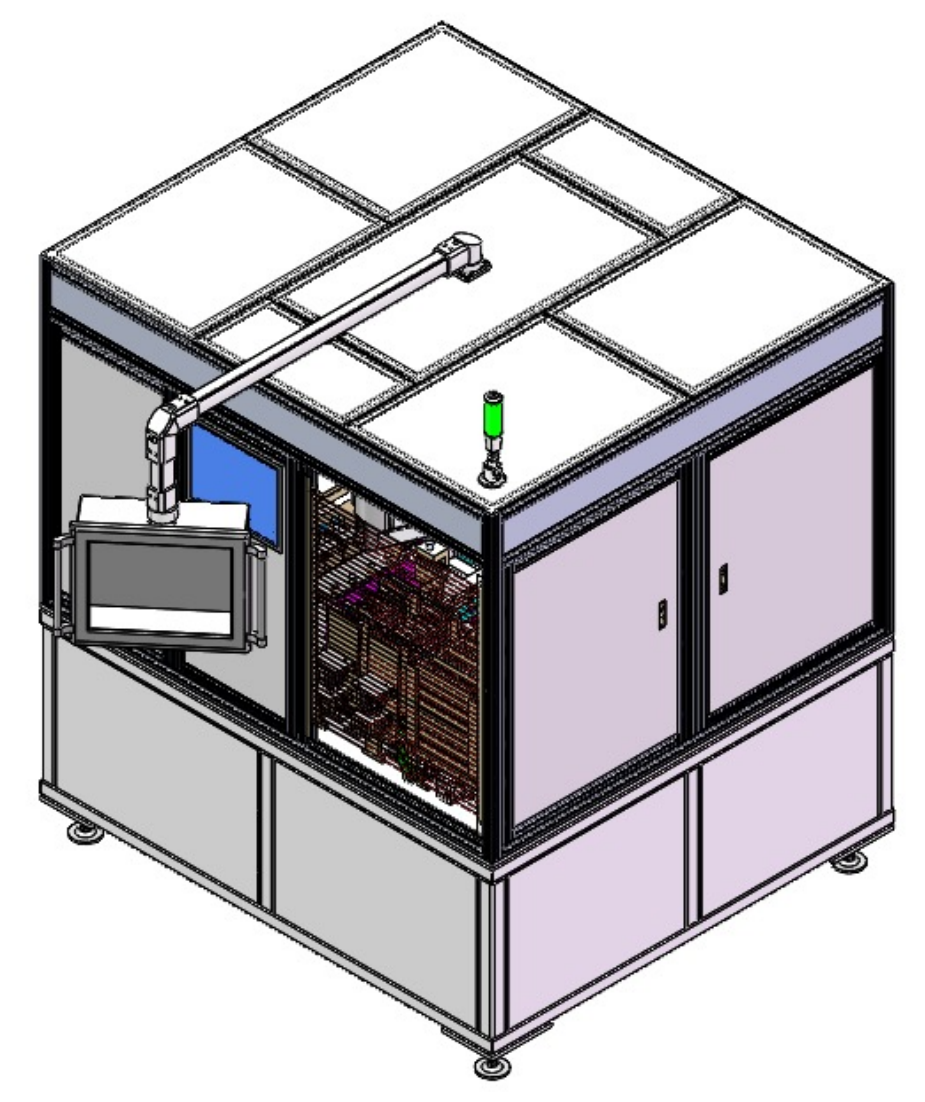
机构设计

Mechanical Design



Machine Overview

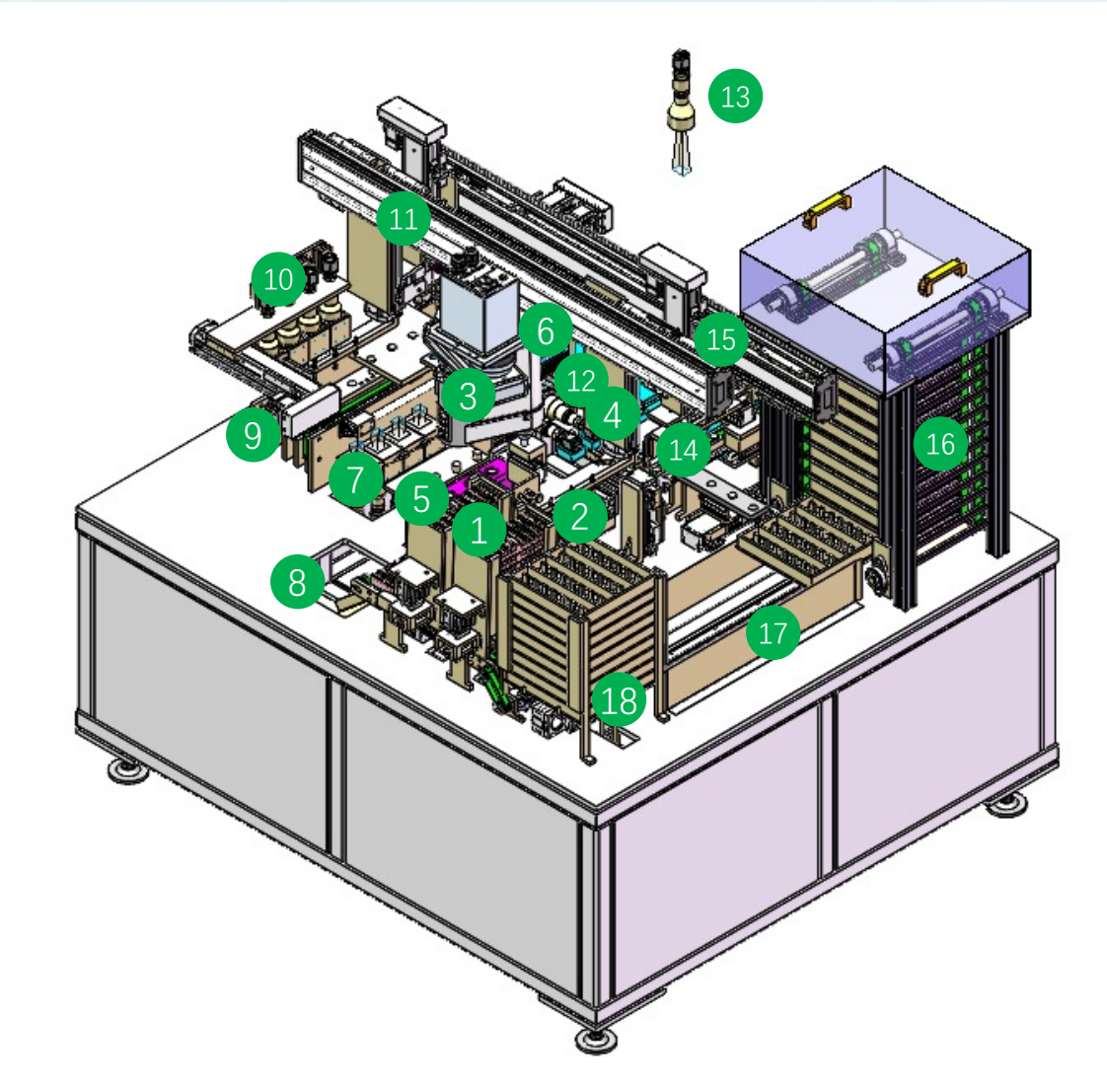




Machine Overview

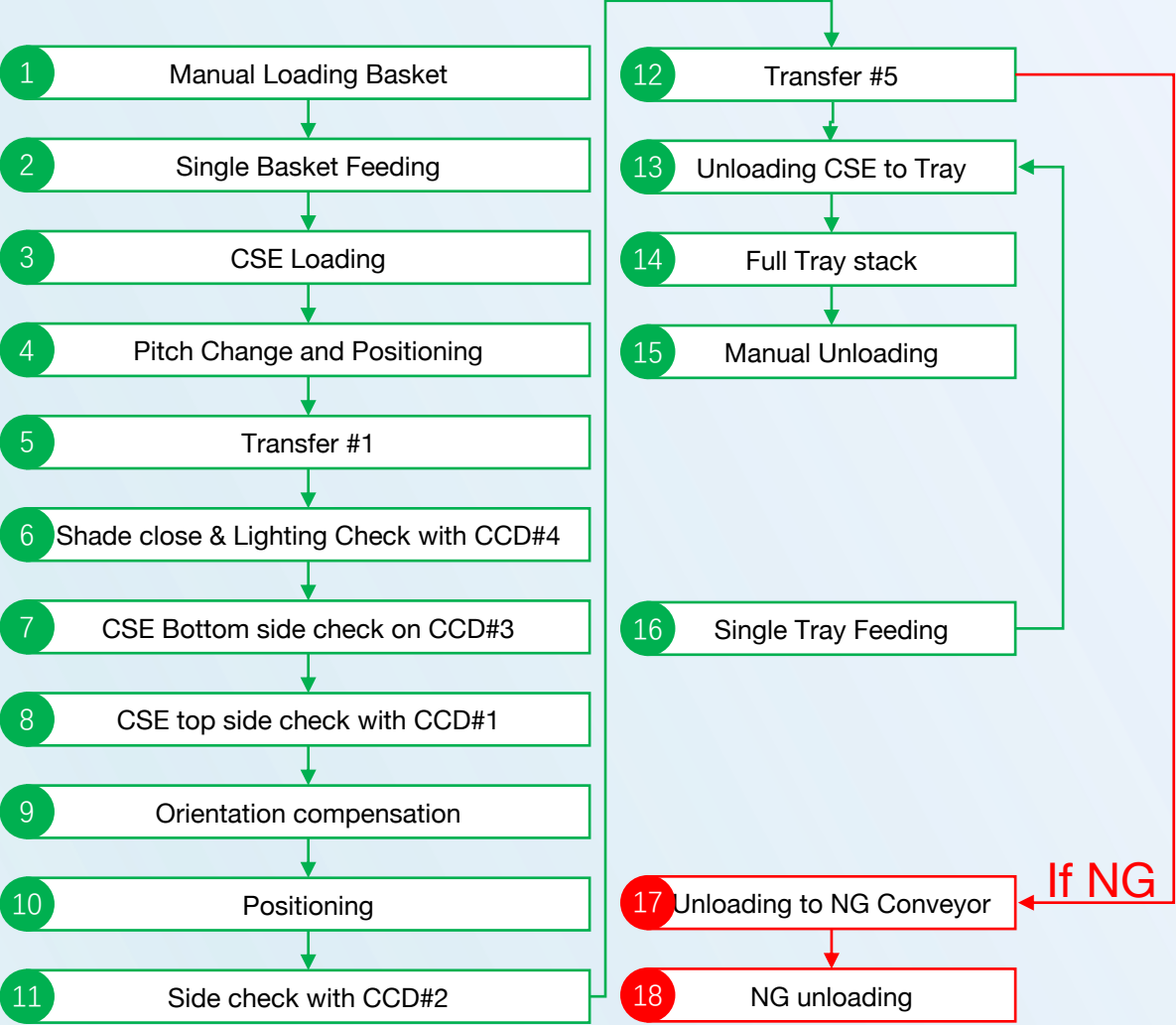
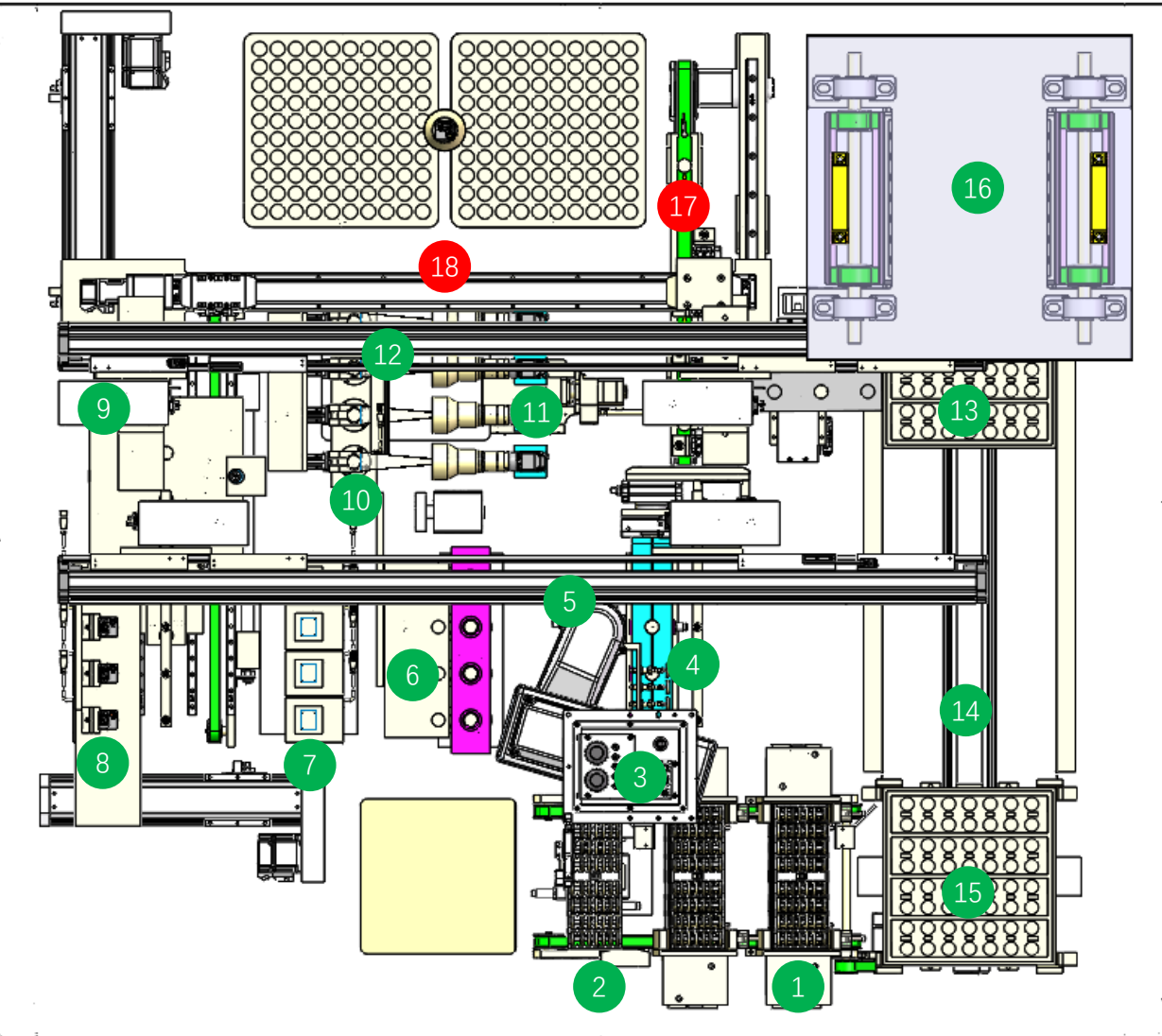


- 9 Transfer #3
- 8 Empty Basket Collector
- 7 CCD #3
- 6 Transfer #2
- 5 CCD #4
- 4 Transfer #1
- 3 Robot #1
- 2 Pitch change Mech. #1
- 1 Loading Basket



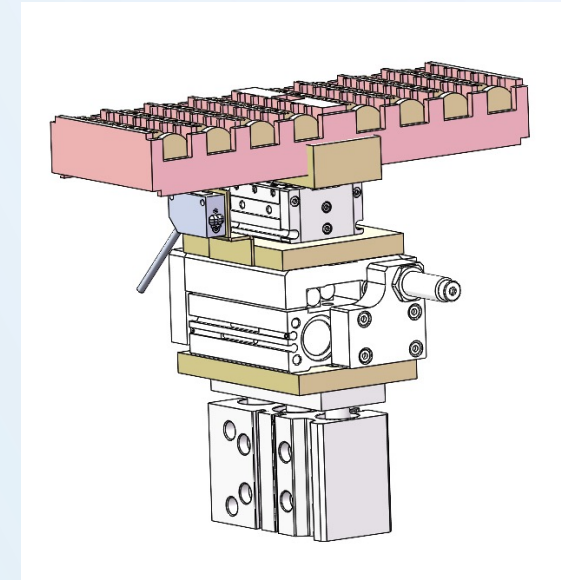
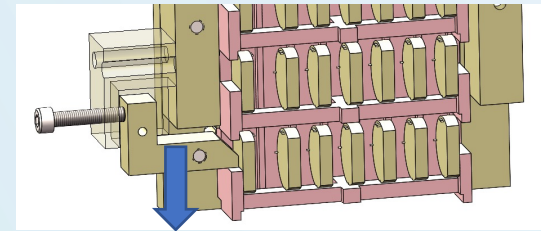
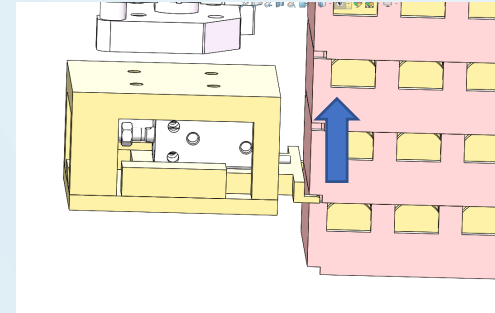
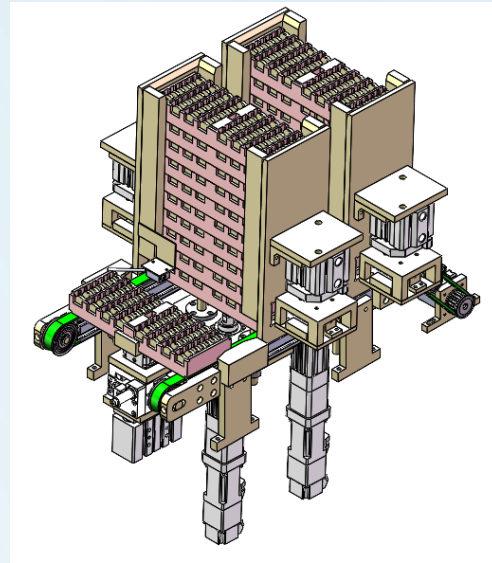
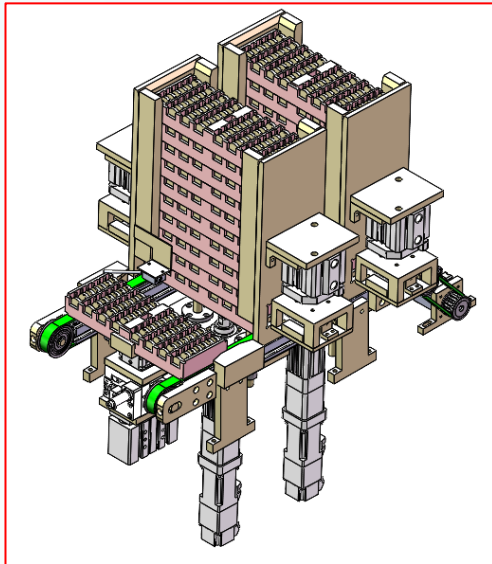
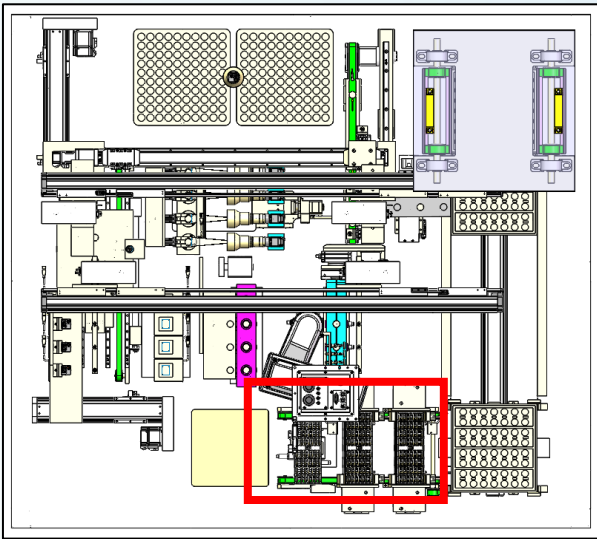
- 10 CCD #1
- 11 Transfer #4
- 12 CCD #2
- 13 NG Check CCD
- 14 NG conveyor
- 15 Transfer #5
- 16 Empty Unloading Tray
- 17 Transfer #6
- 18 Unloading Tray

Process Flow



Single Basket Feeding

DINNAR

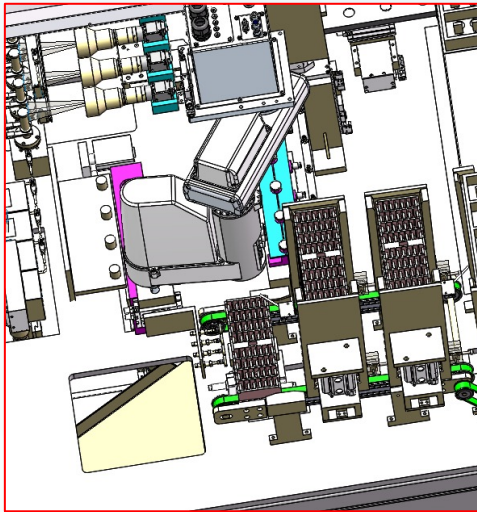
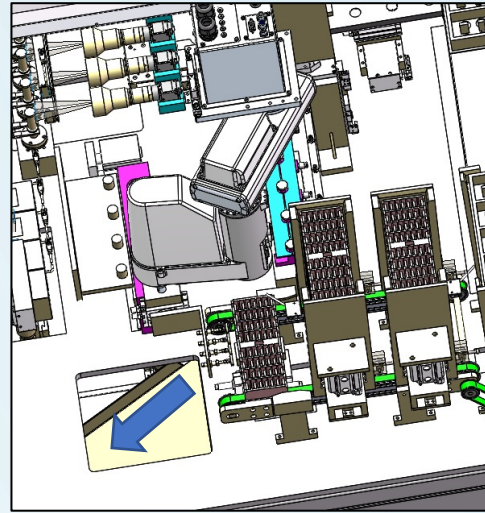
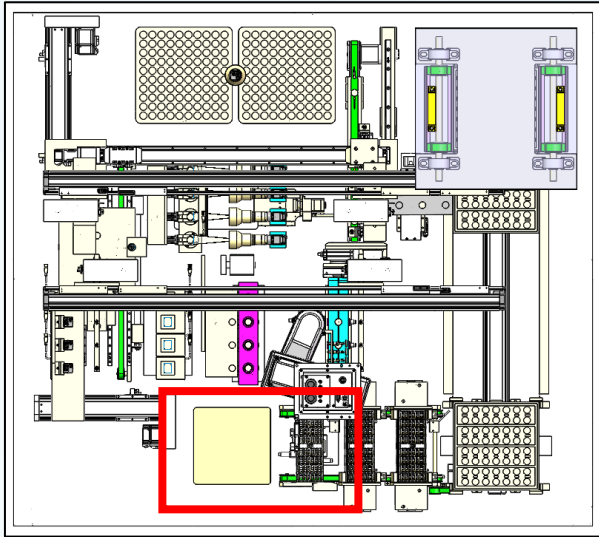


1. Operator manually loading basket onto the standby position.
2. Upside baskets are hold up by cylinder.

3. Last bottom side of the basket is held by the holding block triggered by cylinder. Lifter module spilt the last basket from stock. L trigger hold the last basket from moving up.

4. Last basket load down onto the holder. CSE ready for pick up.

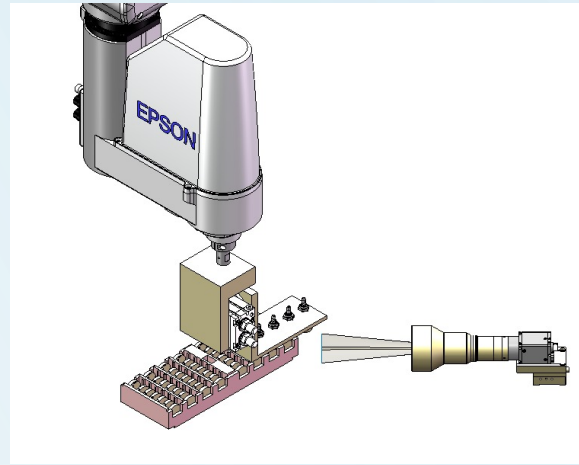
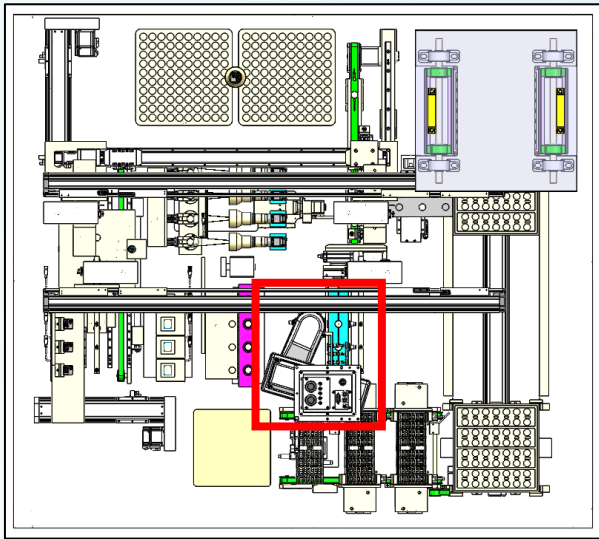
Empty Basket Unloading



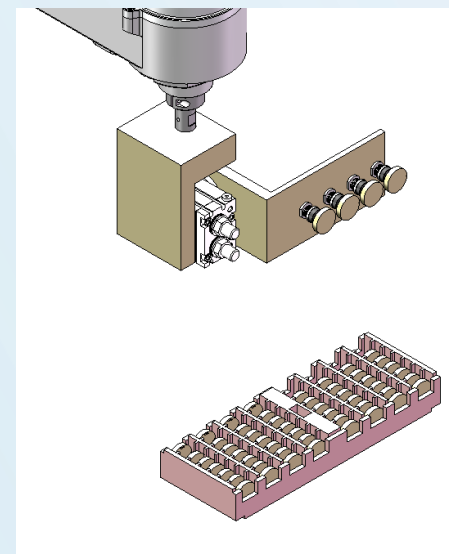
1. Empty basket move to the empty basket collector.

CSE Loading

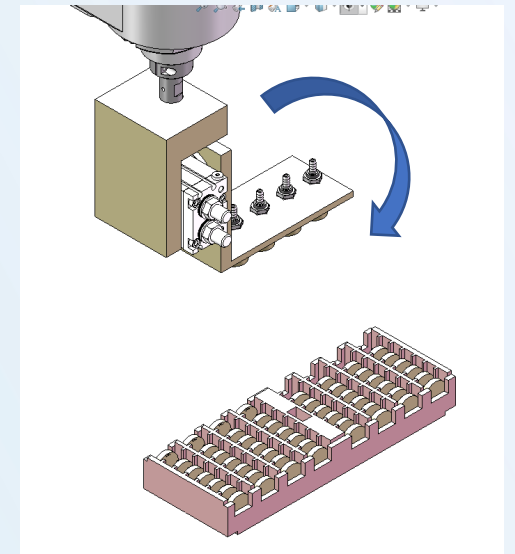
DINNAR



1. CCD check CSE orientation (Poka-Yoke)



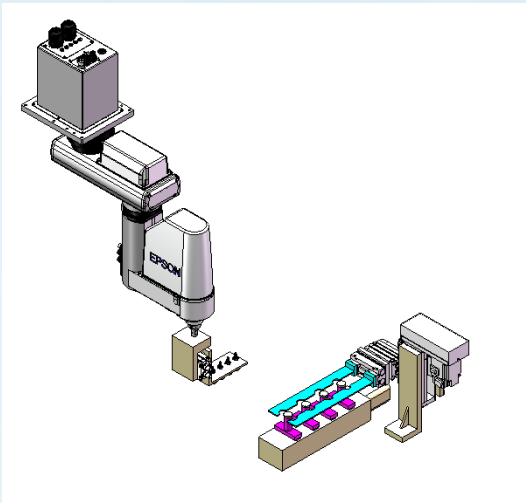
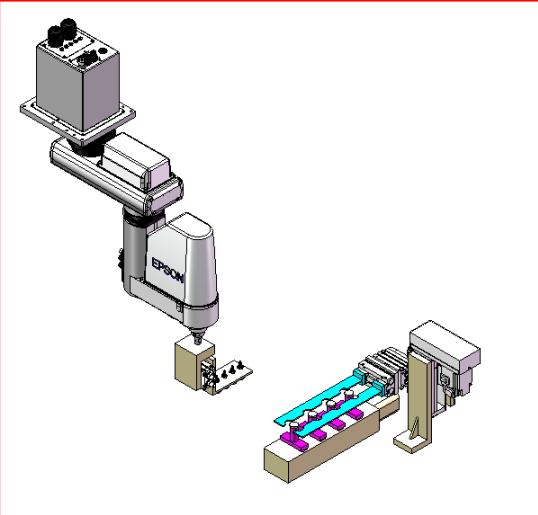
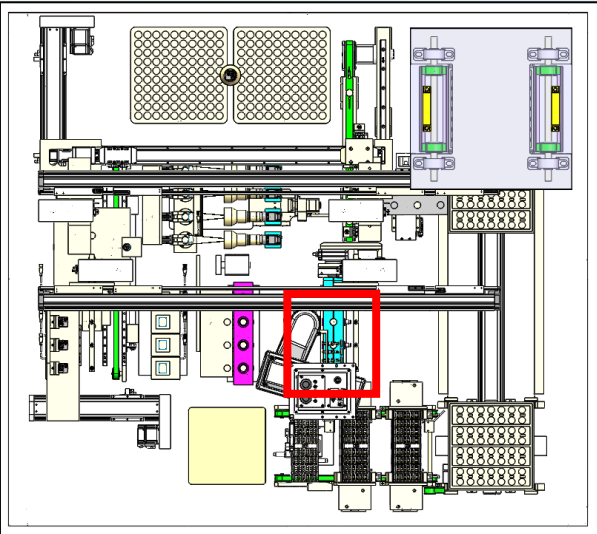
2. Robot #1 with nozzle pick up 1st group of 4 CSEs.



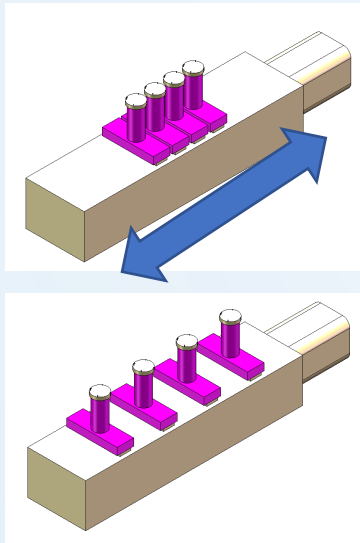
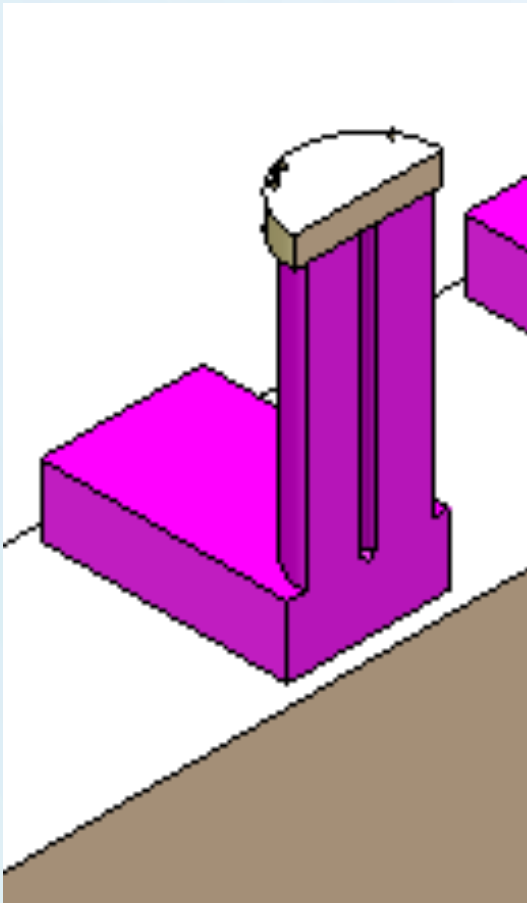
3. Robot #1 rotate CSE in 90°

1. 1st case nozzle sucks the CSE bottom side.
2. 2nd case nozzle sucks the CSE top side (all the rest)

Pitch Change and Positioning

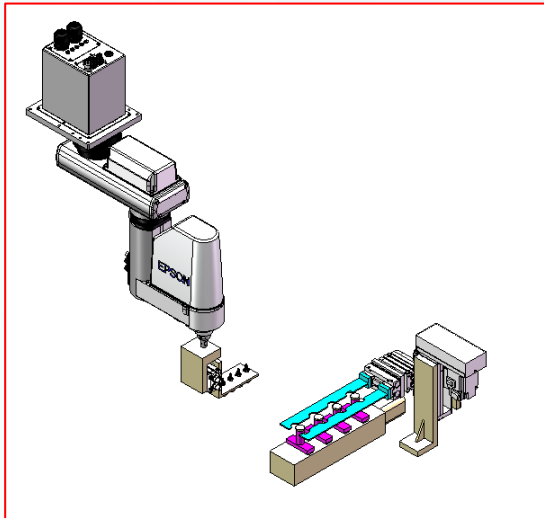
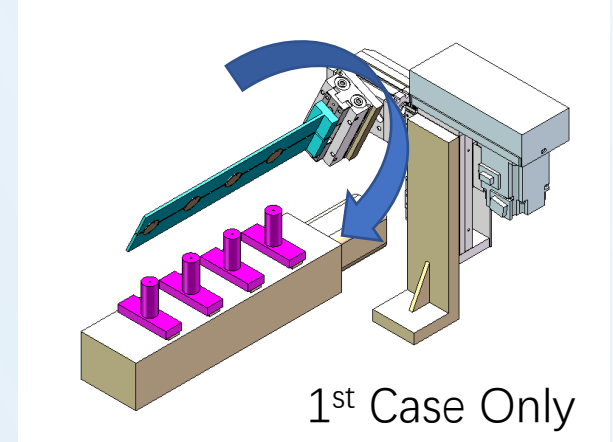
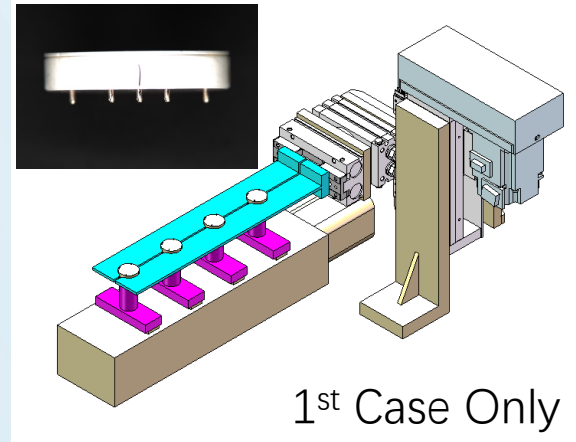
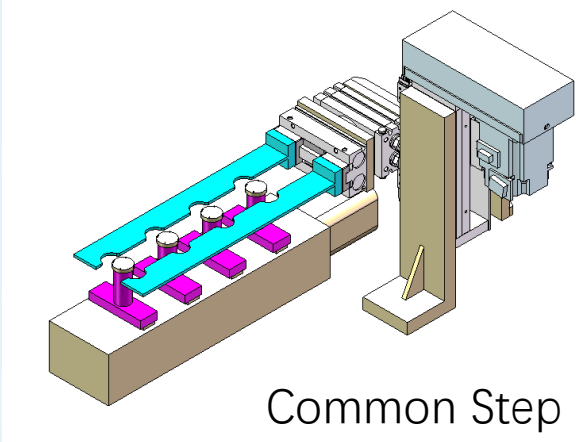
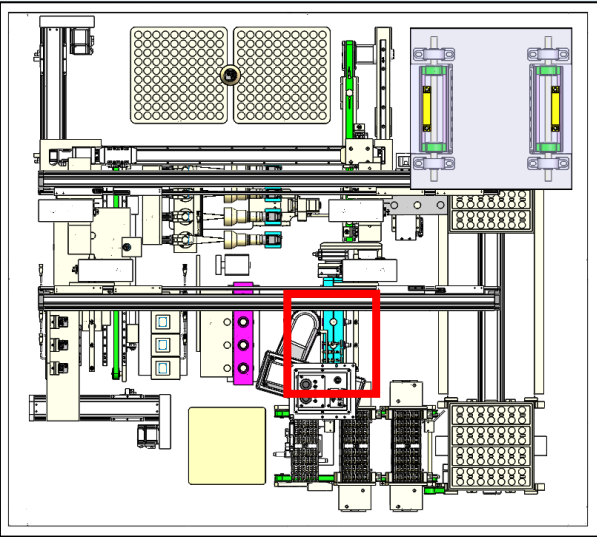


1. Robot #1 transfer 4 CSEs onto the purple platform, vacuum in platform generated.



2. Purple platform change pitch by e-cylinder.

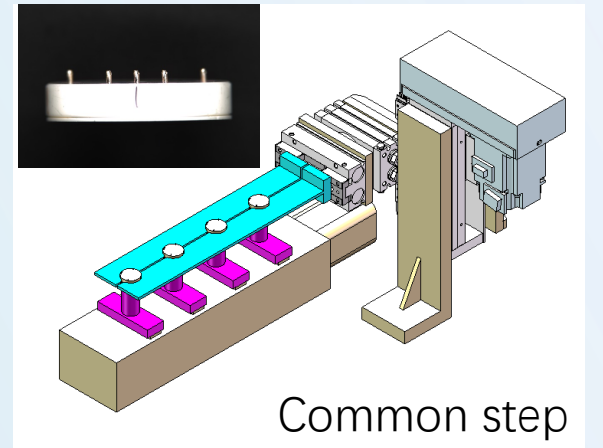
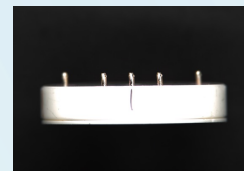
Pitch Change and Positioning



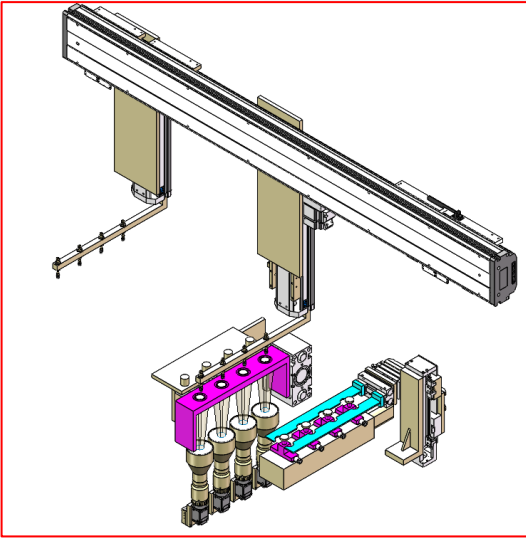
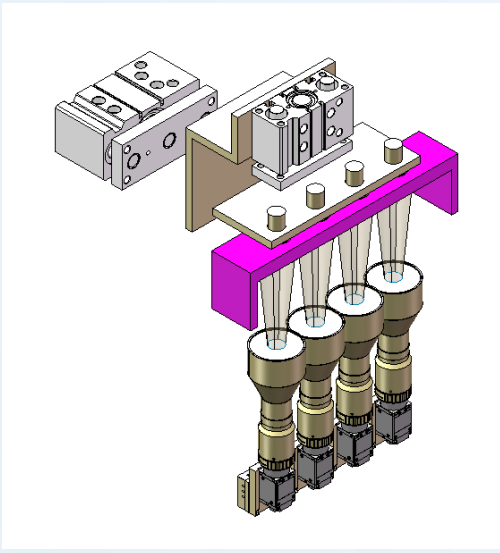
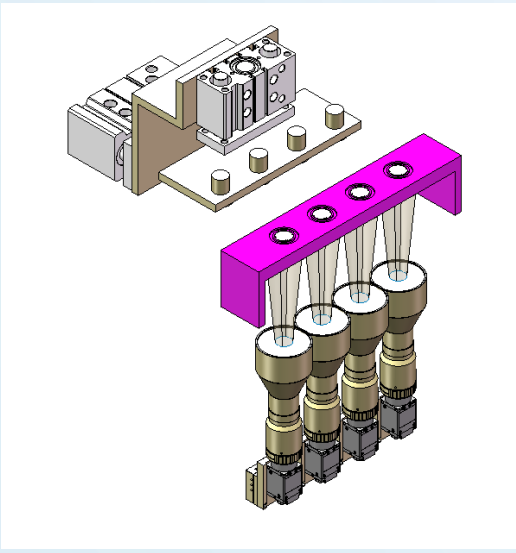
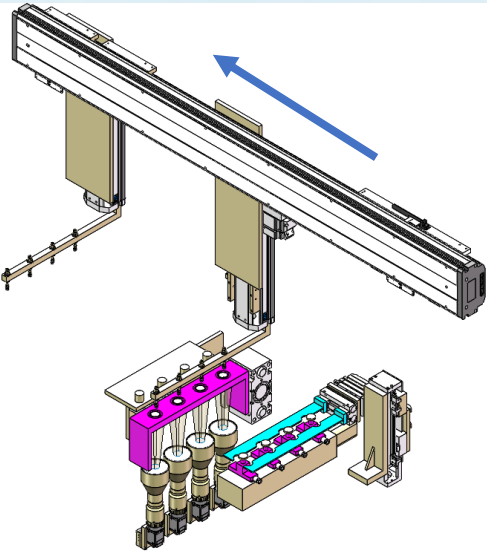
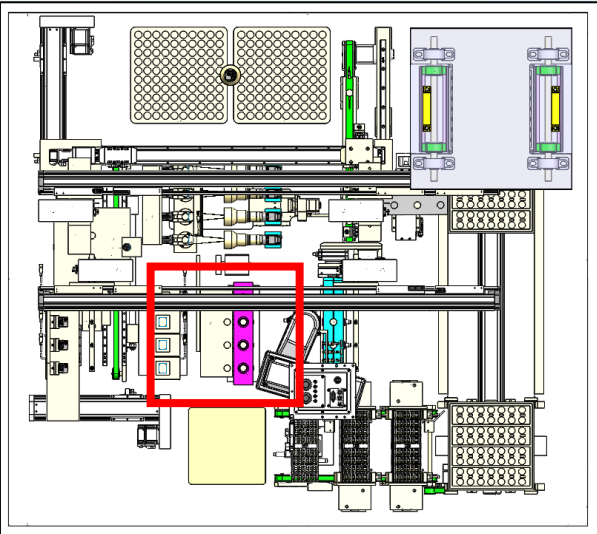
3. Blue holder closes and positioning CSEs

1. In 1st case blue holder turn CSEs over in 180° and positioning.
2. In 2nd case blue holder just positioning.

All the CSEs are in below status before transfer #1 movement

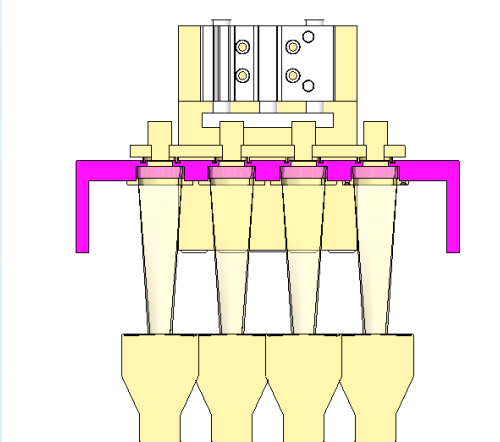


CSE Lighting Check

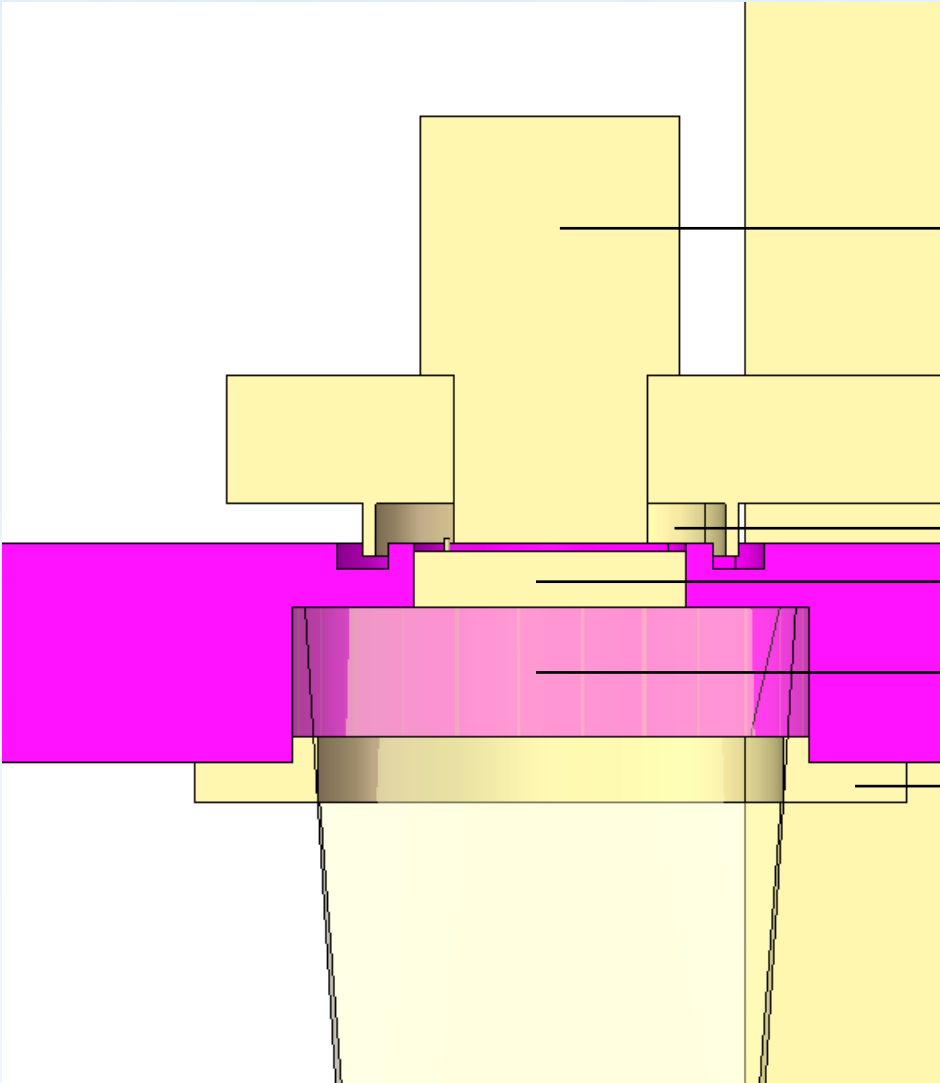
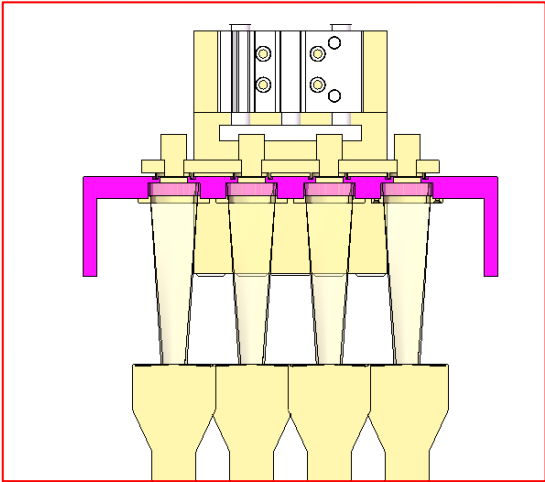
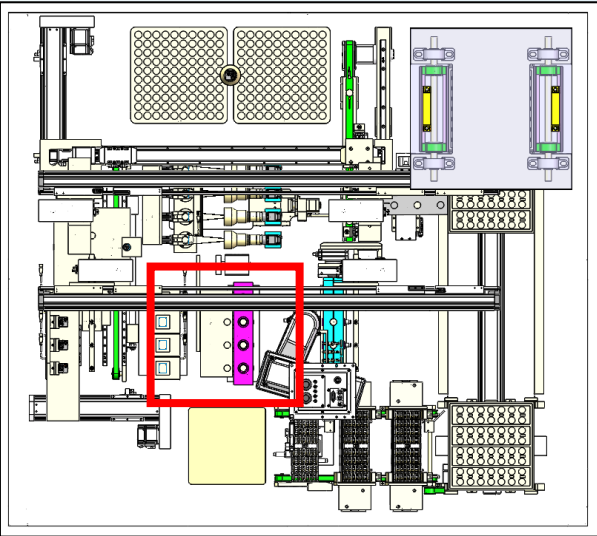


1. Transfer#1 move CSEs from pitch change mech. to lighting check position.

2. Light source and shade move forward and cover the CSEs with shell structure. CCD#4 finish lighting check.



CSE Lighting Check



Hyper Light Source

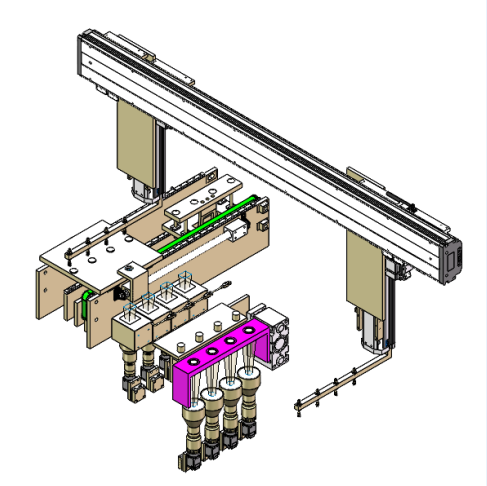
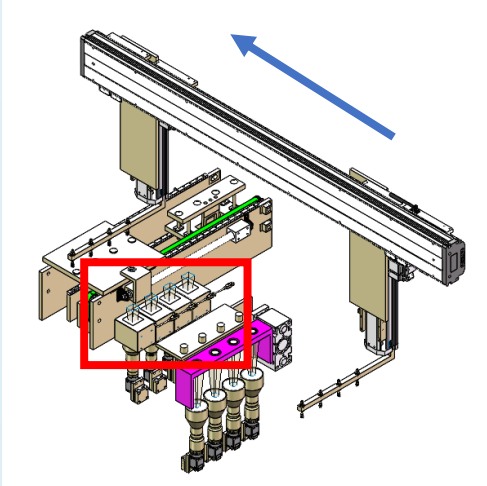
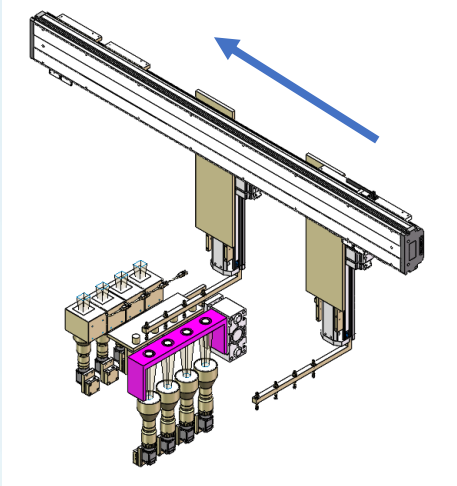
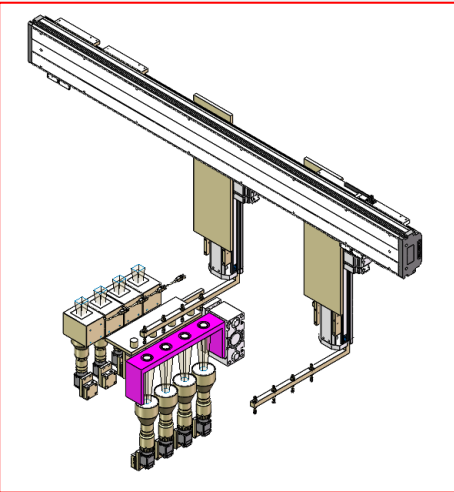
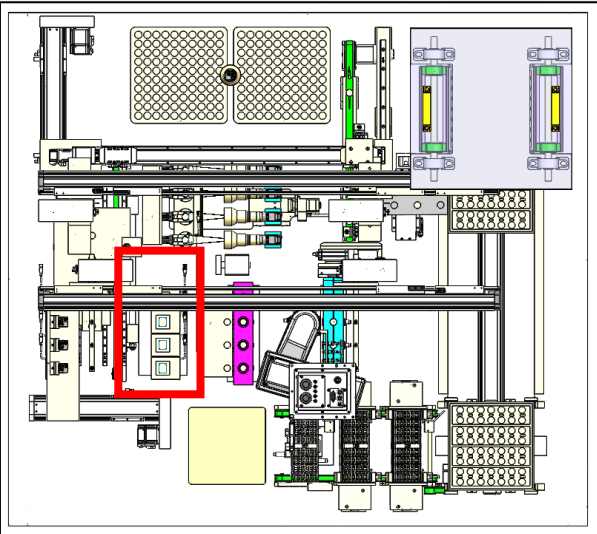
Closed Chamber

CSE

Sapphire Glass

Glass cover

CSE Bottom Side Check

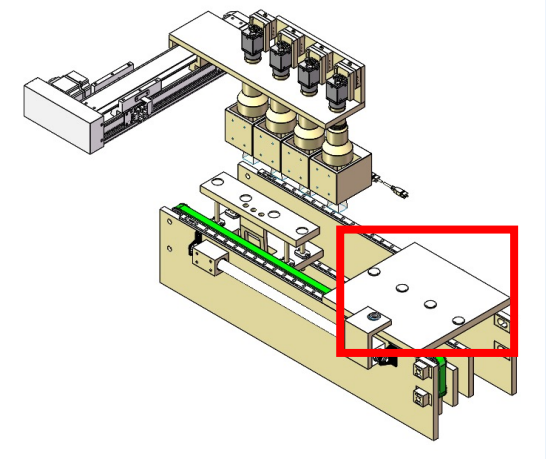
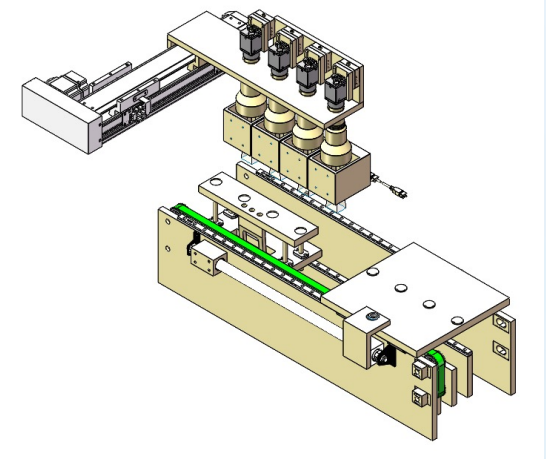
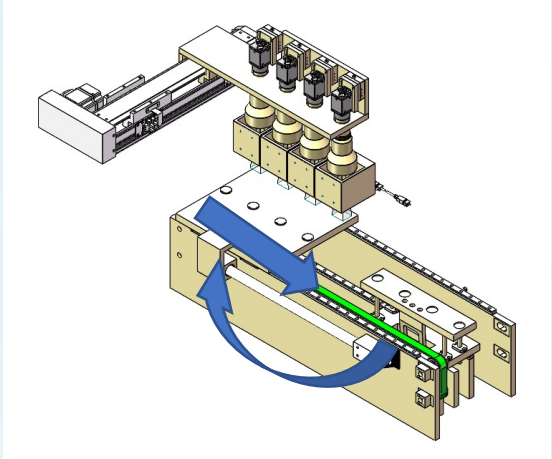
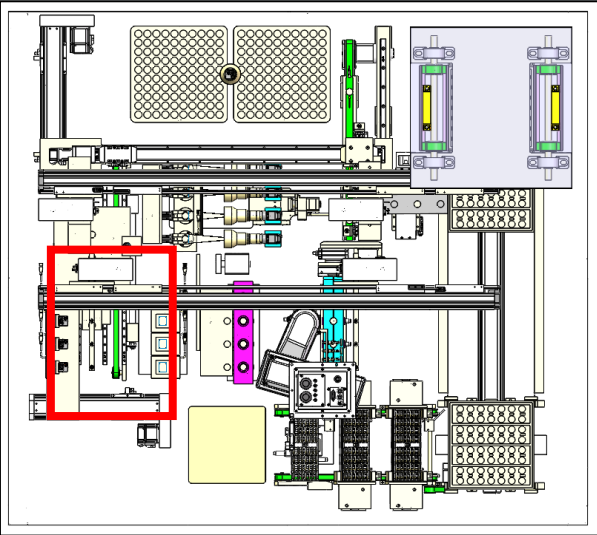


1. Transfer #2 move CSEs from purple platform to Transfer#3.

2. CCD#3 Check bottom side of the CSEs while Transfer #2 moving.

3. Transfer #2 place CSEs on the transfer #3.

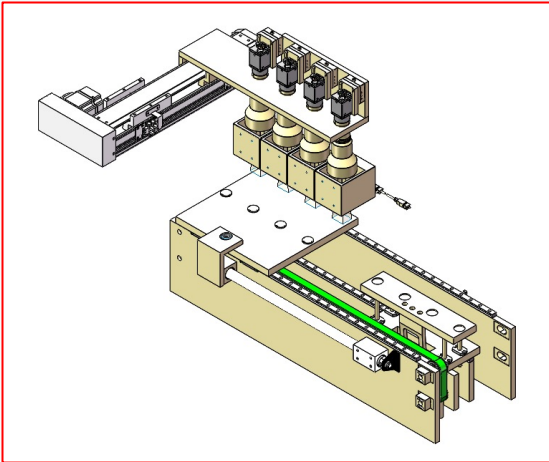
CSE Top Side Check



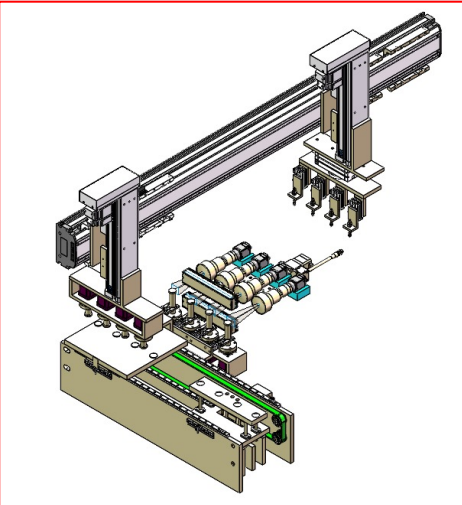
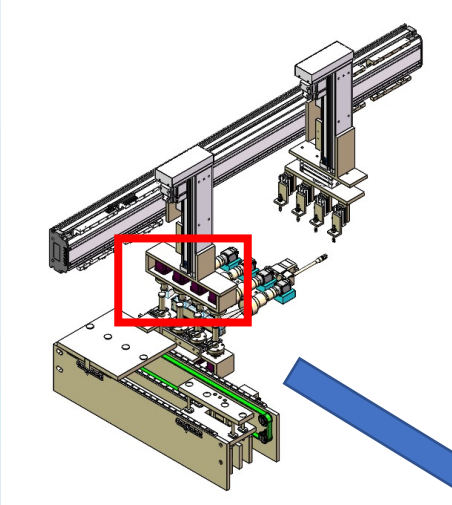
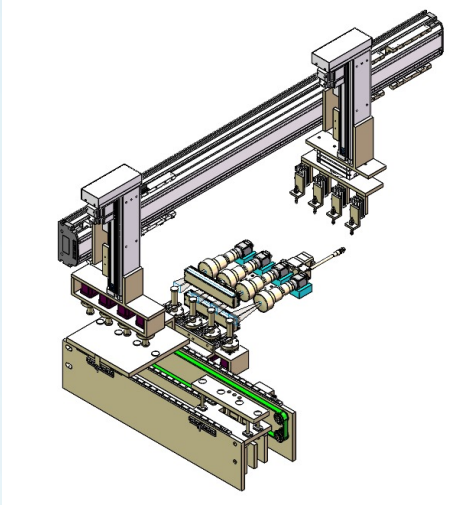
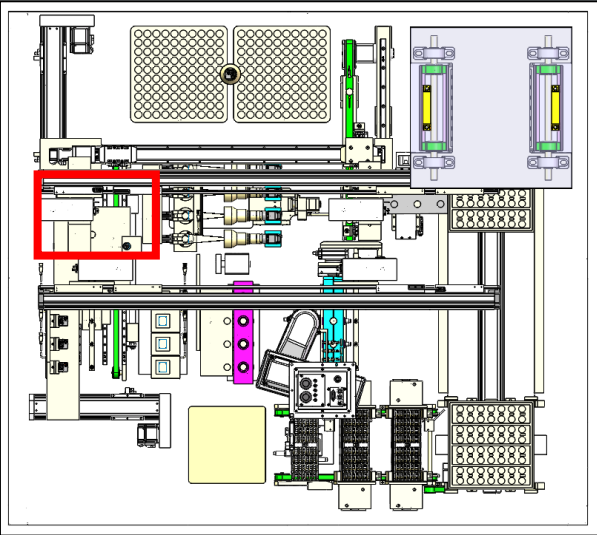
1. CCD#1 reach out and inspect the top side of the CSEs.

2. CCD#1 Move back, transfer #3 change position.

3. Inspected CSEs ready for transfer.

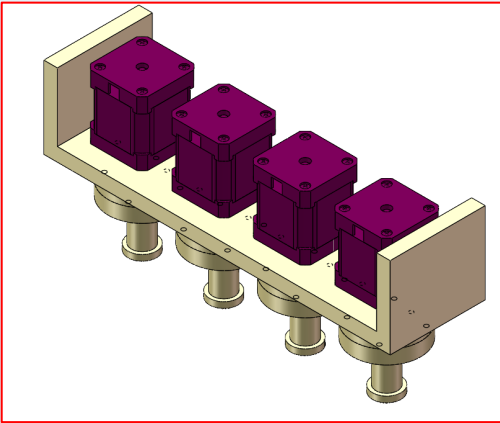


Compensation & Transfer #4

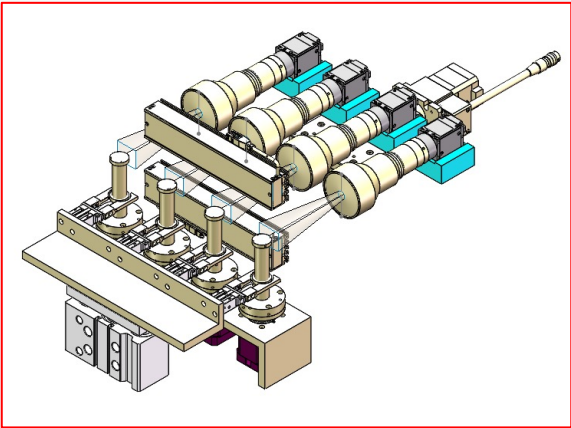
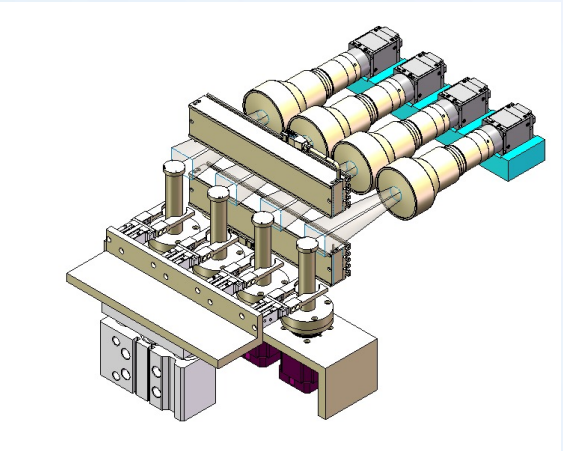
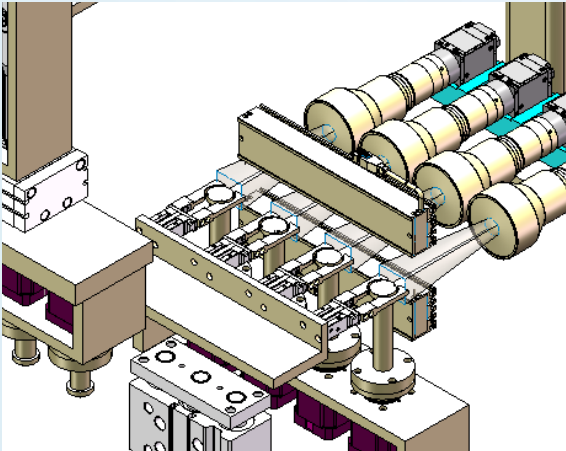
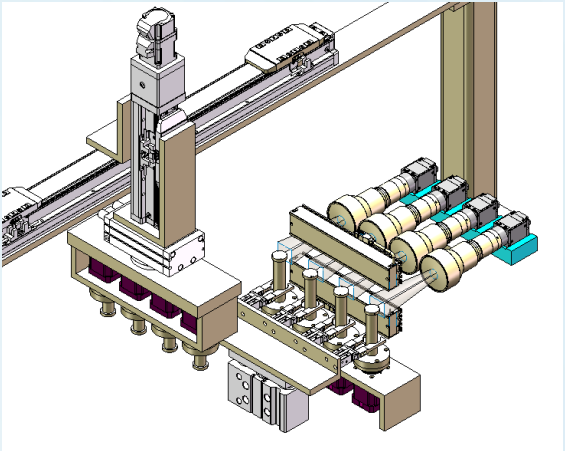
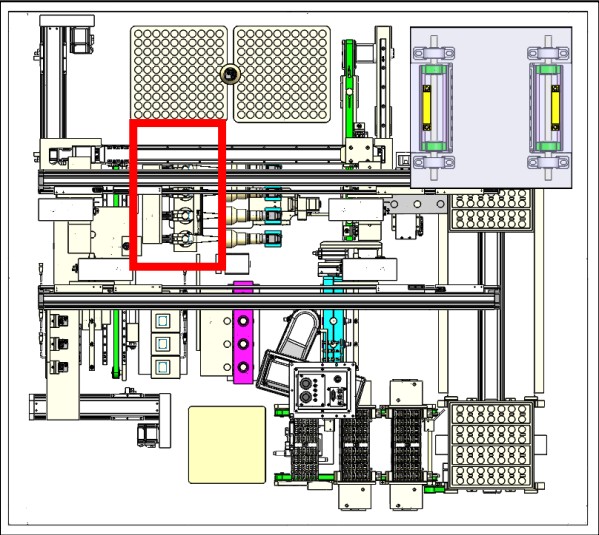


1. Transfer#4 pick CSEs from transfer#3.

2. Transfer#4 adjust the orientation of CSEs while it transfer CSEs to side check position.

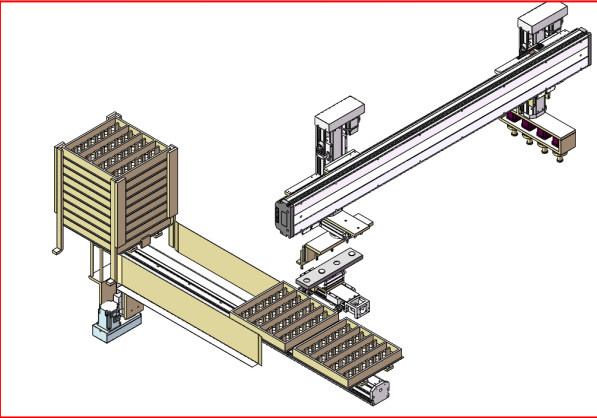
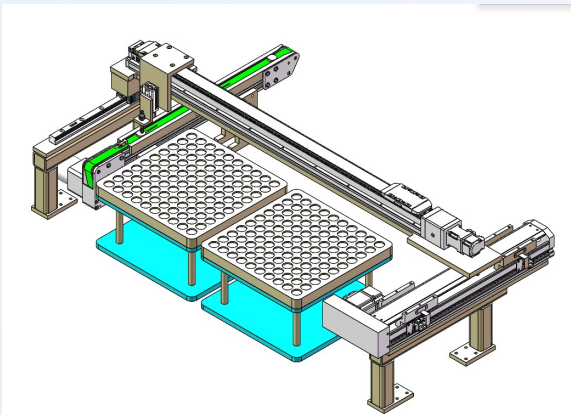
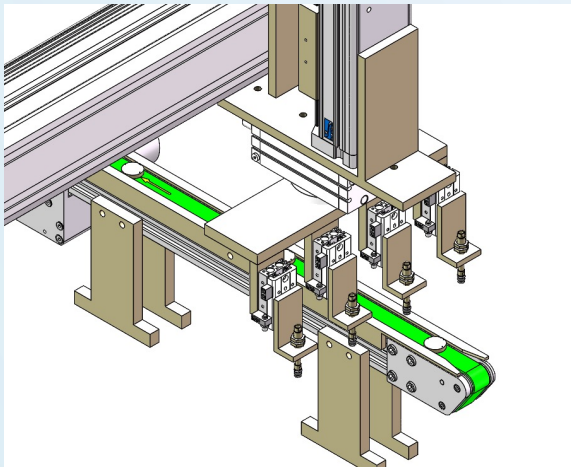
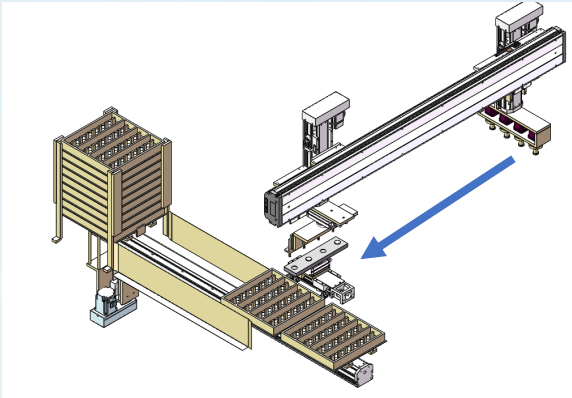
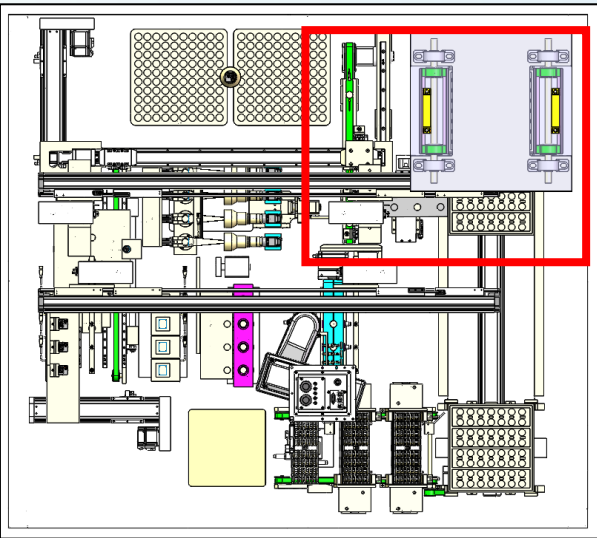


CSE Side Check



1. Transfer#4 place CSEs onto the side check position, vacuum generated.
2. Gripper lift up and positioning CSEs.
3. CSEs turn 360° by motor rotator, CCD#2 check the side and Pin on CSEs.

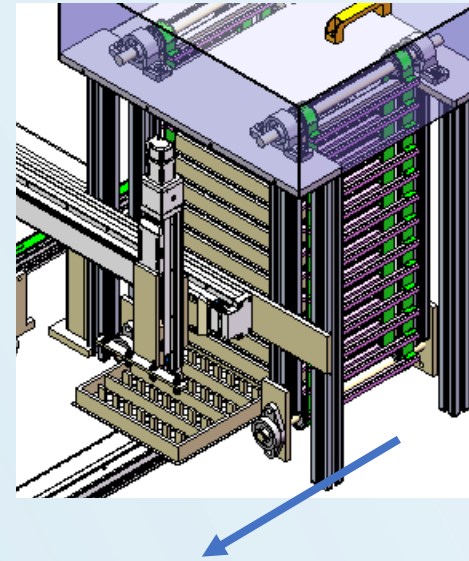
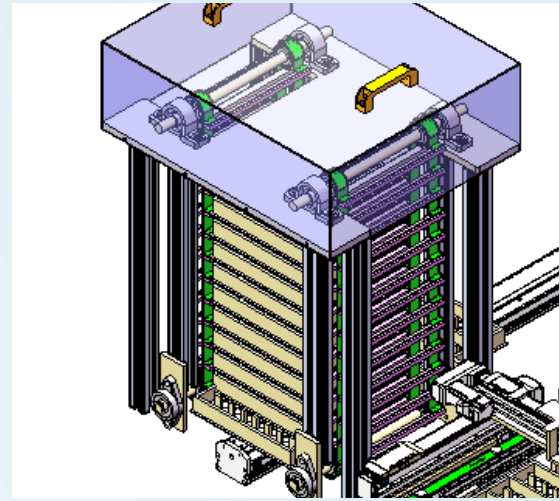
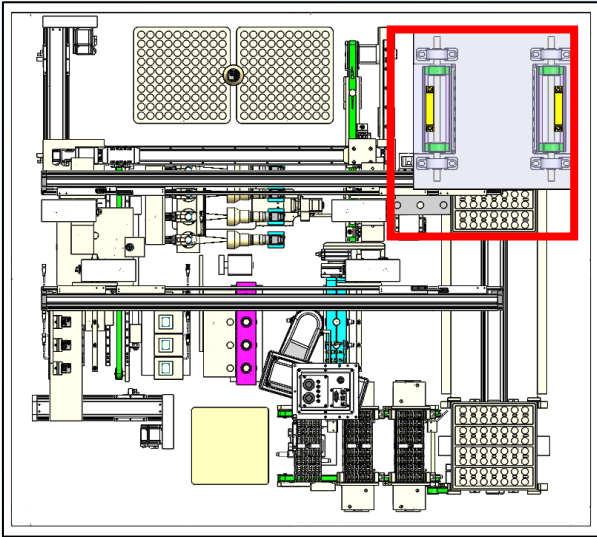
CSE Unloading



1. Transfer #5 unloading OK CSEs to tray.

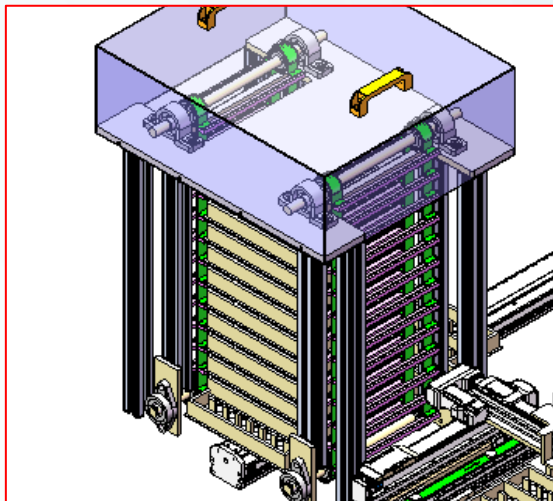
NG
1. NG CSEs are placed on NG belt, move to certain position and stop by holder bar. NG Transfer unloading NG CSEs from NG conveyor to NG Tray.

Single Tray Feeding

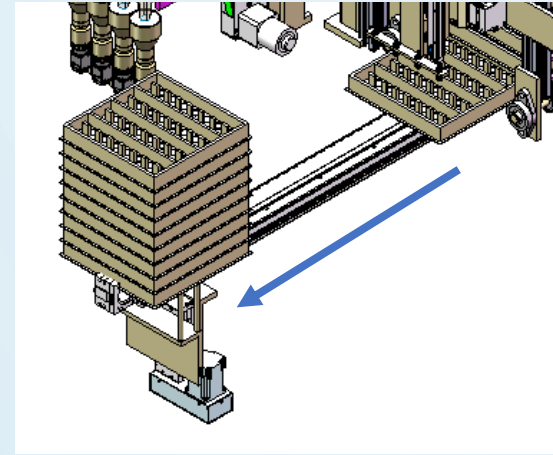
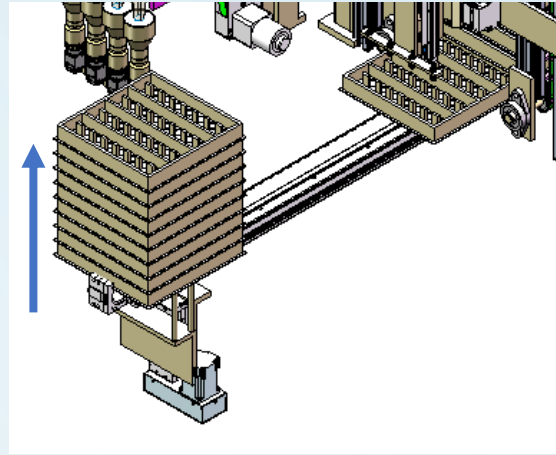
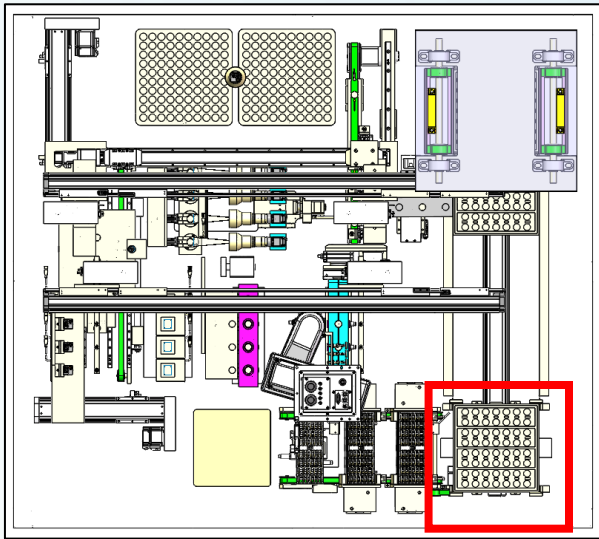


1. Operator manually loading empty tray to loader.

2. Loader feed 1 single empty tray when former tray is full, Which monitored by upside Camera.

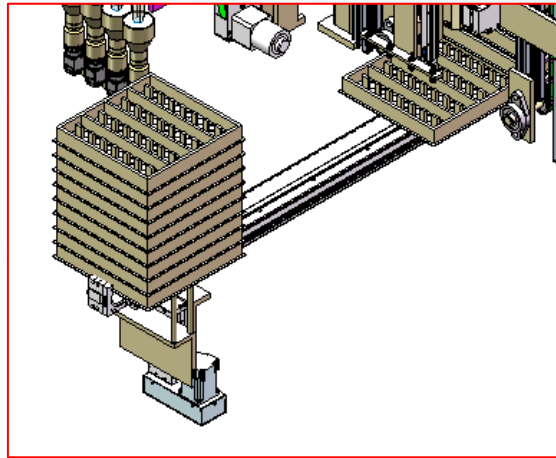


Full Tray Stack and Unloading



1. Gripper lift full trays up, new full tray come from position 1 to position 2, gripper release. Full tray stacks.

2. Operator unloading stacked full tray manually.



Lighting Check:

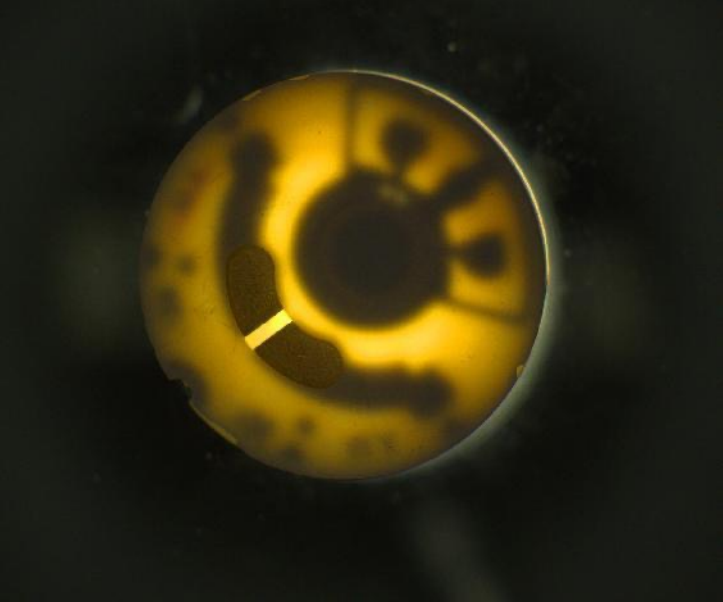
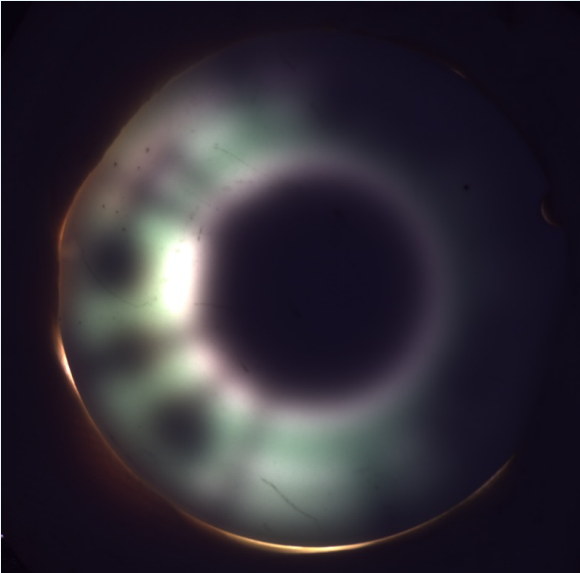


Image Capture

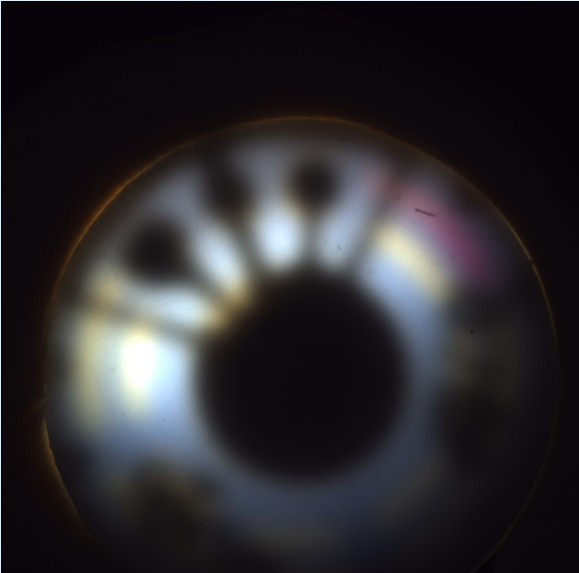


Detect Result

Lighting Check Thick Samples:



Green



Blue

Crack Check:

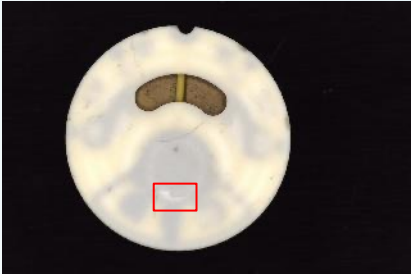


Image Capture



Detailed Result



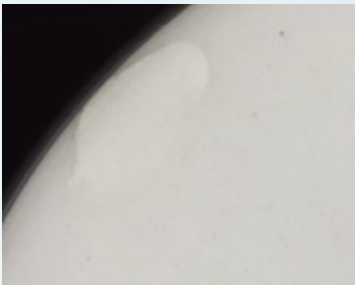
Image Capture



Detailed Result



Image Capture



Detailed Result

Broken Check:

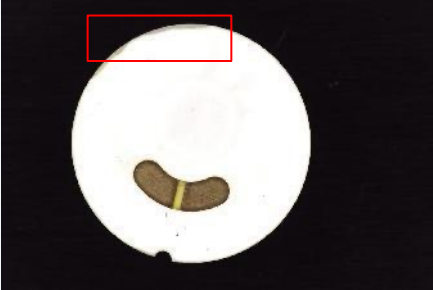


Image Capture



Detailed Result



Image Capture



Detailed Result

Epoxy Exposal:

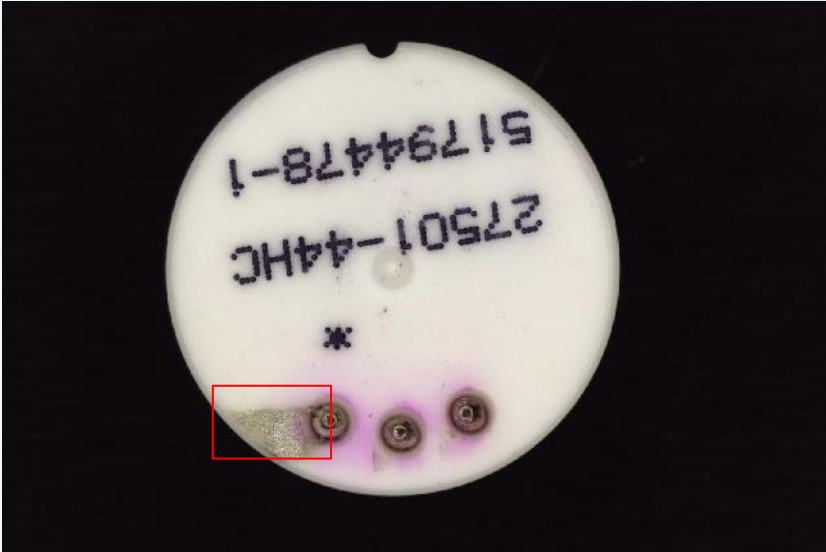
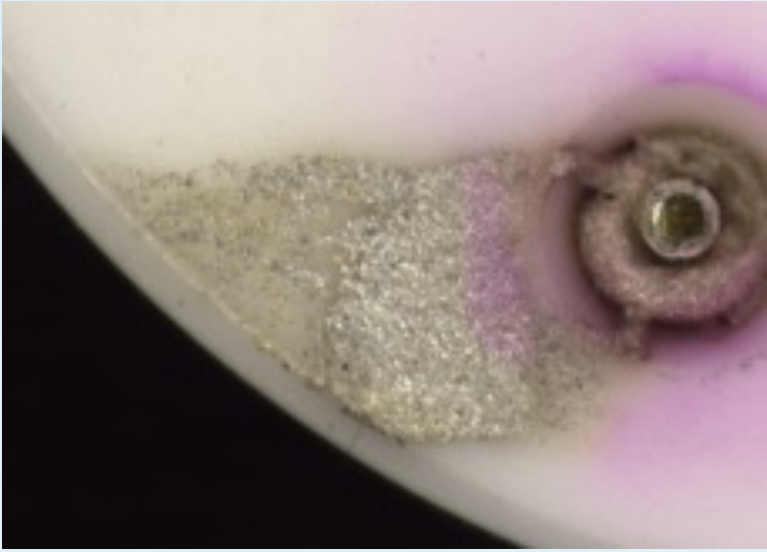


Image Capture



Detailed Result

Pin Missing:

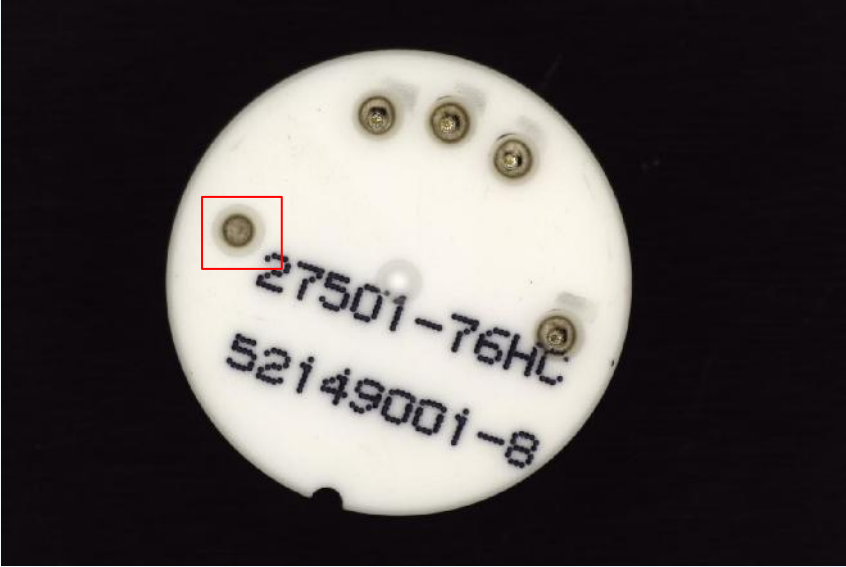
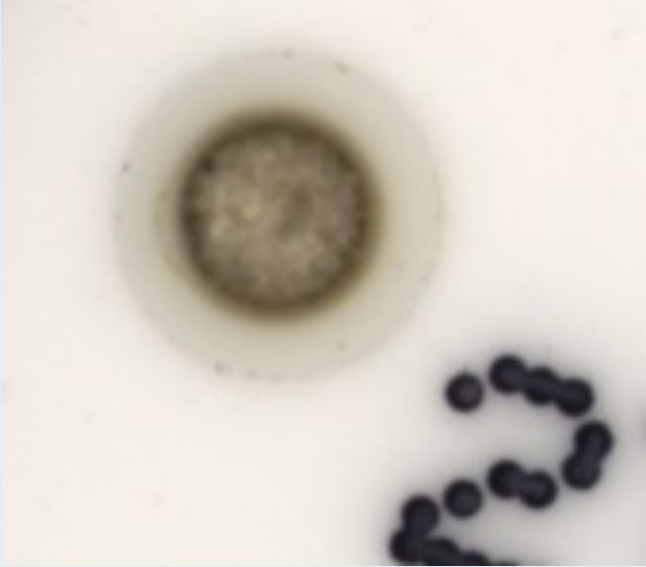


Image Capture

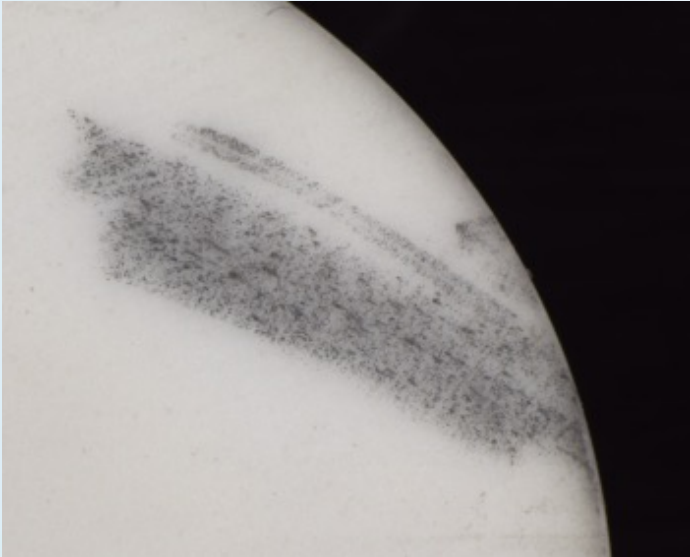


Detailed Result

Electrical contamination:



Image Capture



Detailed Result

Gold exposal:

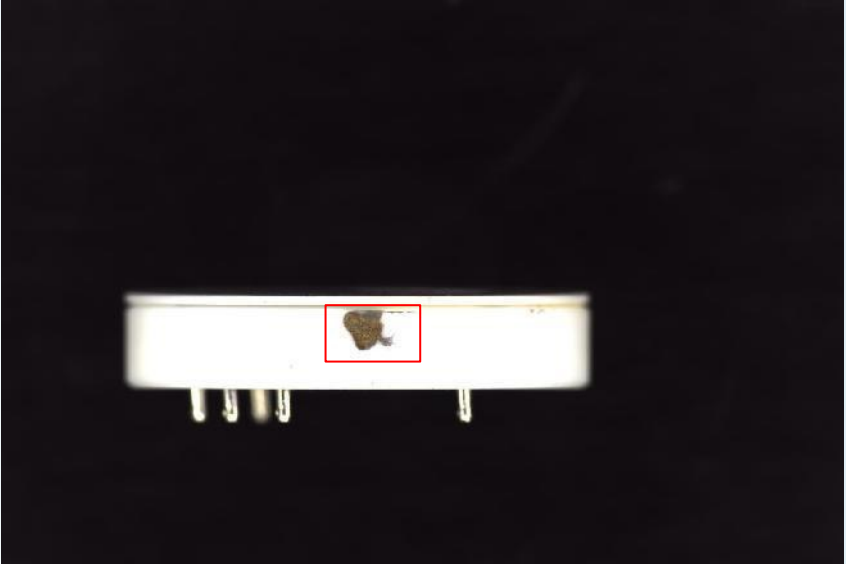
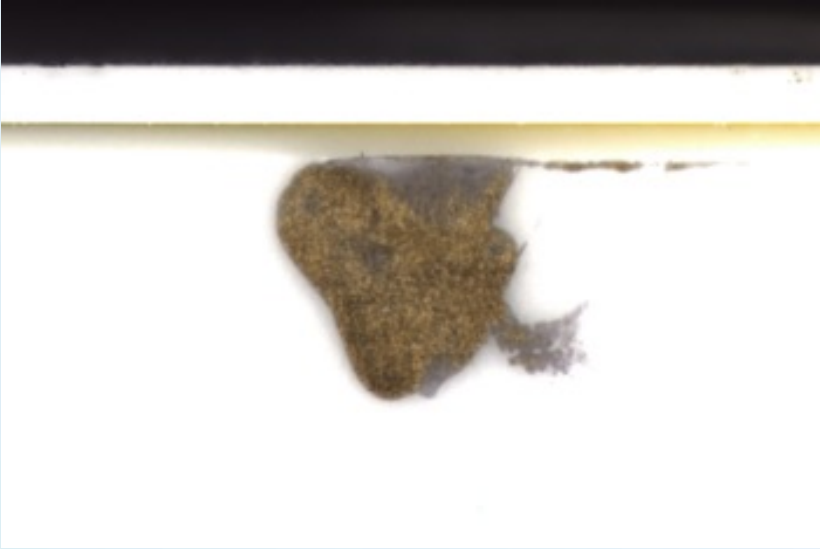


Image Capture



Detailed Result

Insufficient Epoxy:

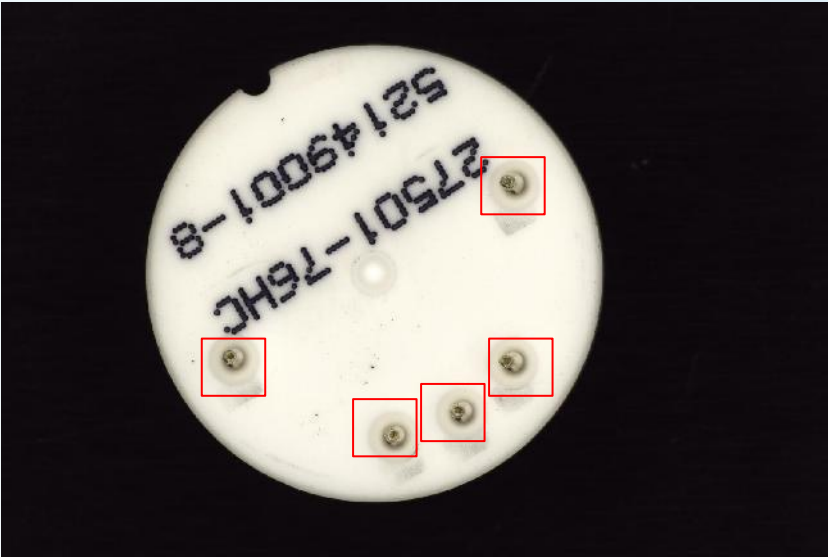
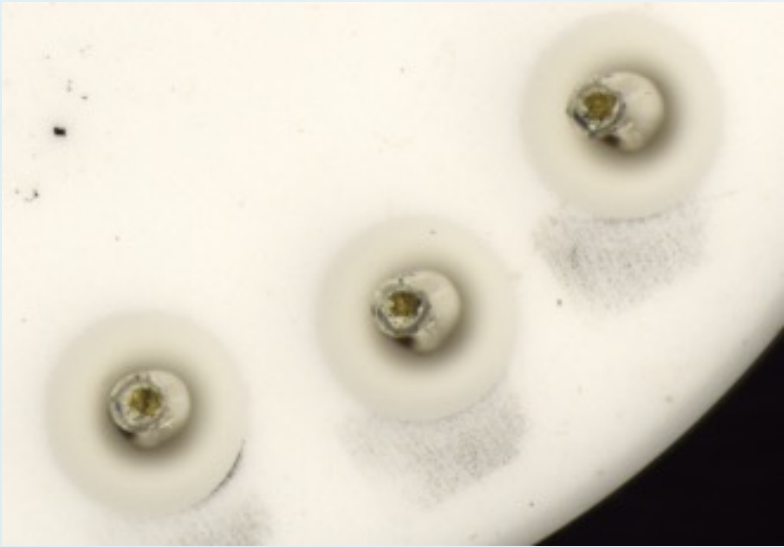


Image Capture



Detailed Result

Dyeing contamination:

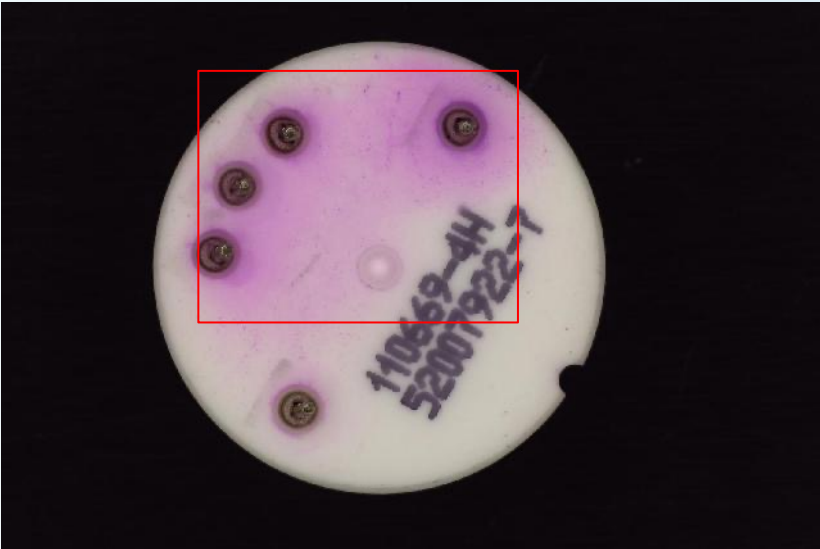
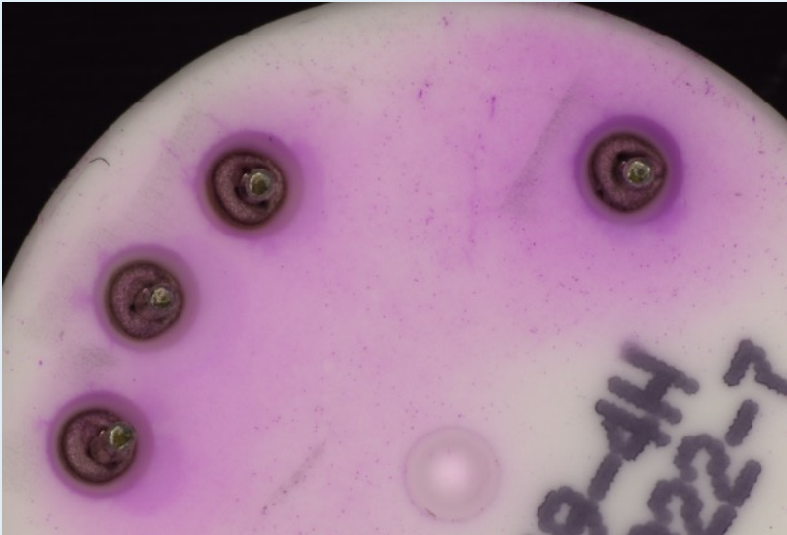


Image Capture

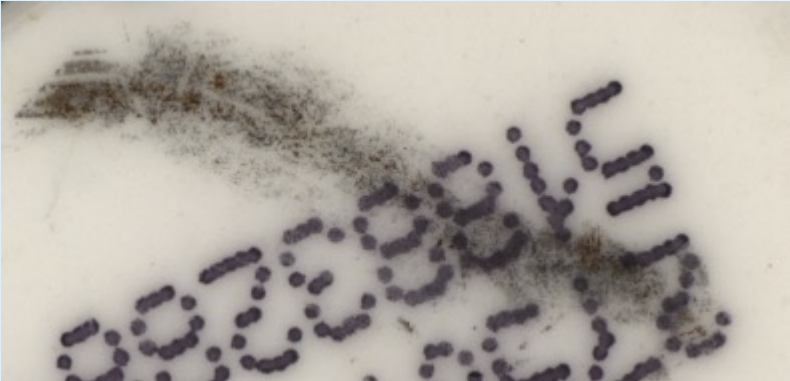


Detailed Result

Non-Electrical contamination:



Image Capture



Detailed Result

No code:

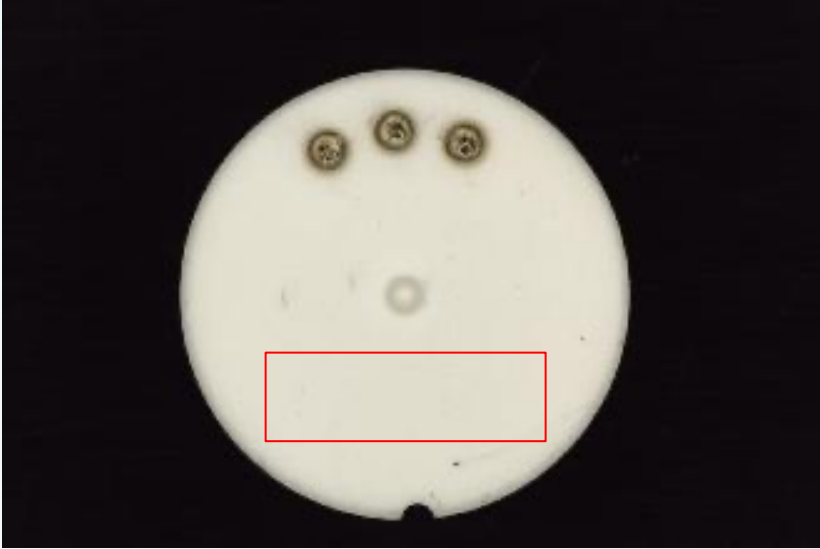


Image Capture



Detailed Result

Code Blur:



Image Capture



Detailed Result

Pin bent:

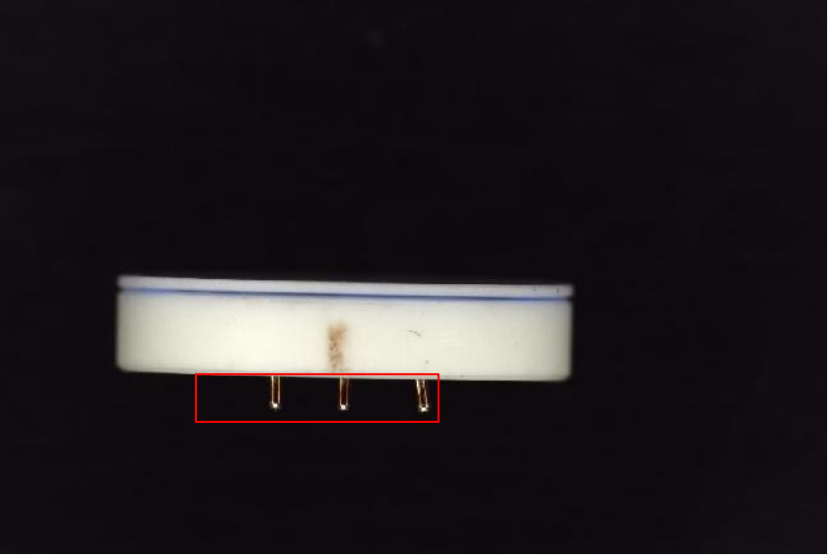
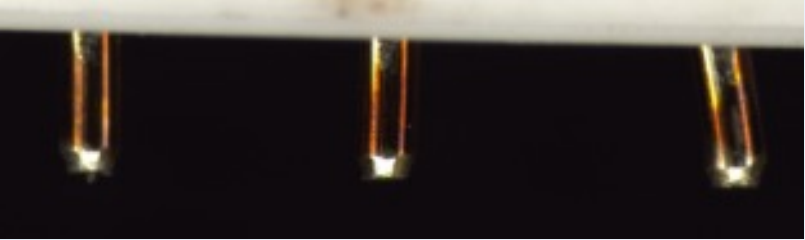


Image Capture



Detailed Result

Epoxy Overflow:

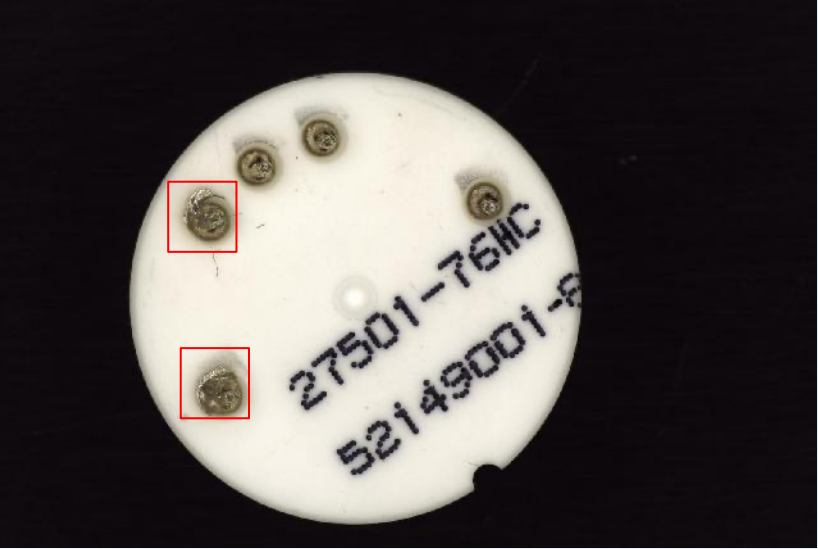


Image Capture

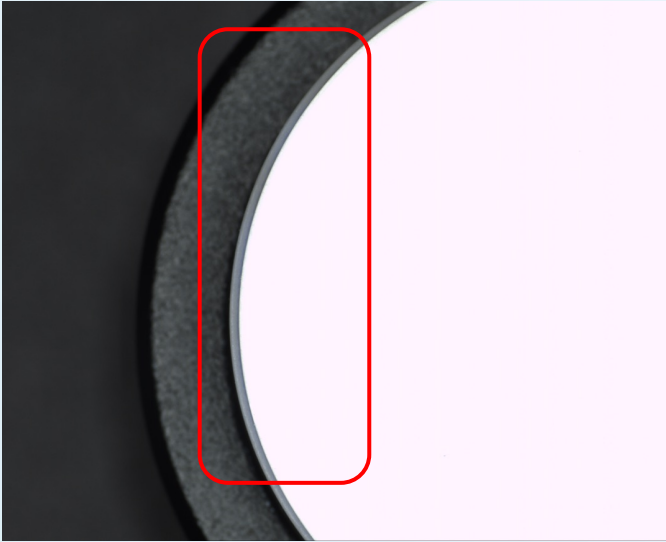


Detailed Result

Misalignment:



Image Capture



Detailed Result