



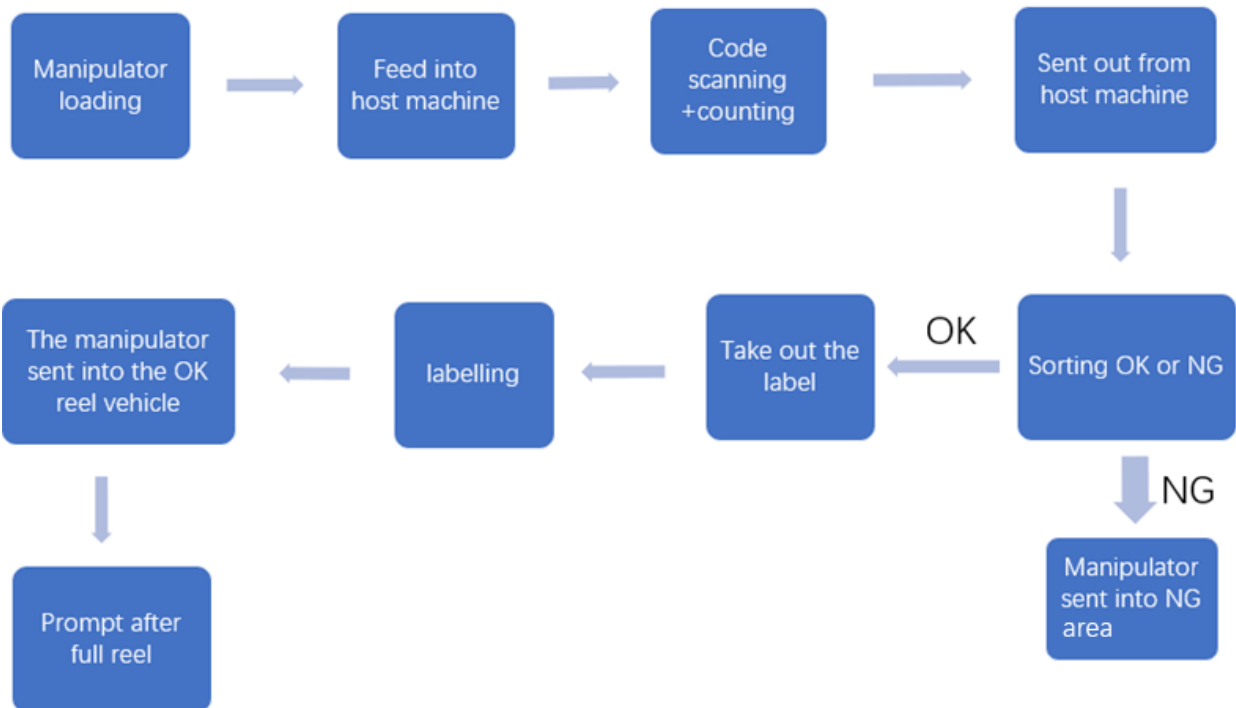
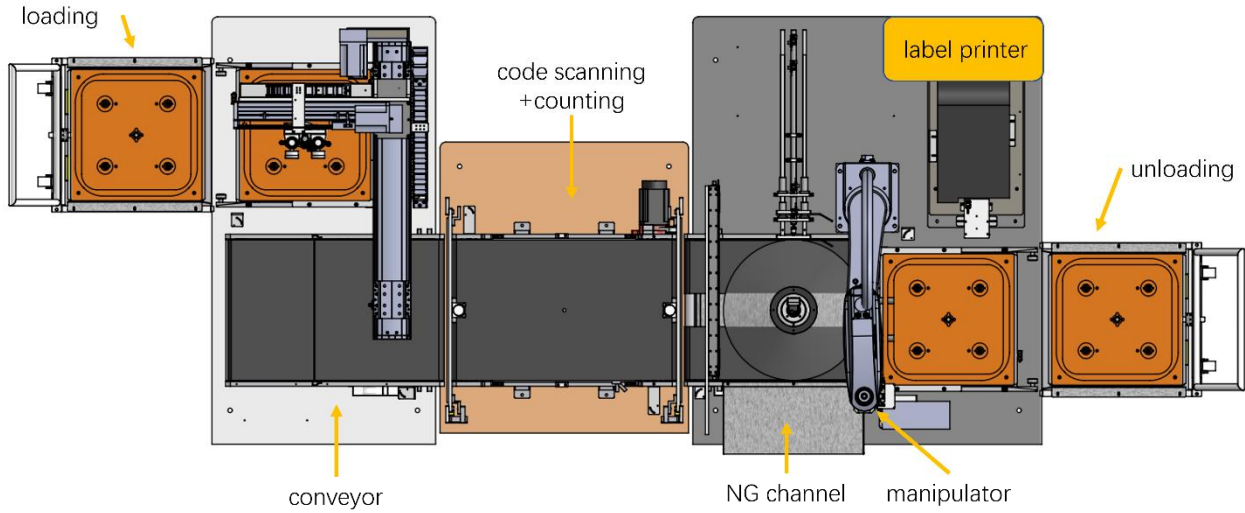
Product Introduction

In-line full automatic X-ray parts counter SIL-1000



Microfocus X-Ray Inspection System Leader

1. Working Principle



2. Our Advantages

- 2.1. 80kV X-ray tube, longer lifetime, maintenance-free.
- 2.2. Super definition 17" digital flat panel detector (FPD).
- 2.3. Ultrafast counting, top speed is only 12s per reel.
- 2.4. Support max 17" (430mm) reel or tray with moisture barrier bags.
- 2.5. Permanently updated AI deep learning algorithm for free, support connecting MES, ERP, WMS, and other management systems.
- 2.6. Support manual mode, which is used in special cases such as small amount of reel, overweight & oversize reel, and packaged reel.
- 2.7. Support AGV docking, realize the whole counting process unmanned.
- 2.8. Support work order number function and counting record query & statistics.

3. Hardware Parameters

X-ray source	Type	Microfocus
	Max tube voltage	80kV
	Max tube current	700 μ A
	Focal spot size	30 μ m
Flat panel detector	Type	Super definition digital FPD
	Effective area	430mm*430mm
	Pixel size	139 μ m
	Resolution	3072*3072
Reel/tray counting	Max size	Auto mode 15" (380mm), manual mode 17" (430mm)
	Max thickness	Auto mode 50mm, Manual mode 80mm
	Min parts size	01005
	Speed	12-15s
	Accuracy	01005 \geq 99.98%, 0201 & above \geq 99.99%
	Media type	Reel materials, tray materials with moisture-proof bag
Equipment	Dimensions	2700mm (L) * 1400mm (W) * 1900mm (H)
	Weight	3000kg
	Power supply	AC110-220V 50/60HZ
	Max power	4800W

	Industrial PC	I7 CPU, 16G RAM, 256G SSD+4T HDD
	Displayer	24" HDMI LCD
	Management system connection	MES, ERP, etc.
Workflow	Loading	After the reel vehicle is pushed in, the manipulator automatically loads, supporting 7 to 15 inches of reel
	Max loading quantity	200 reels (7" with 8mm thickness)
	Barcode scanning	Can scan barcode, QR code
	Reel transfer	Automatic belt transfer
	Labelling	Automatically print and paste labels after counting, and upload data automatically
	unloading	The manipulator automatically put into the reel vehicle
Safety	Radiation leakage	No leakage, international standard: $\leq 1\mu\text{Sv/h}$
	Back door safety interlock	Once users open the back door, X-ray tube will power off immediately. When the back door is open, users can't turn on the X-ray
	Emergency stop	In front of the operation position, press to power off

4. Speed and Accuracy

Till now, the counting time and accuracy of various sizes of reels as below. It will be faster and more accurate as our algorithm updates.

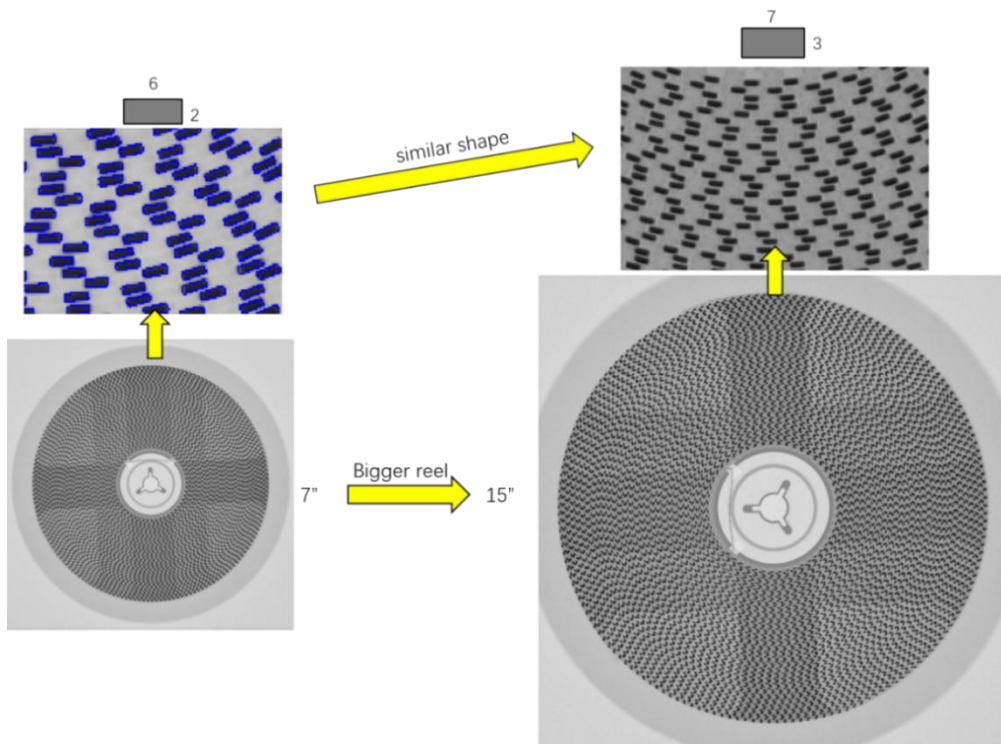
Reel size	Parts size	Quantity	Accuracy	Speed
7" (180mm)	01005	40000	99.98%	14-15s
7" (180mm)	0201	10000	99.99%	13-15s
7" (180mm)	0402	10000	99.99%	13-15s
7" (180mm)	0603	5000	99.99%	12-15s
10" (254mm)	1206	5000	99.99%	12-15s
15" (380mm)	1206	10000	99.99%	12-15s

5. Artificial intelligence deep learning algorithm

Our counting software uses a powerful artificial intelligence deep learning algorithm. No need to bind components to algorithm, we use AI to automatically identify components and automatically apply algorithm. The algorithm can learn the counted component data, such as:

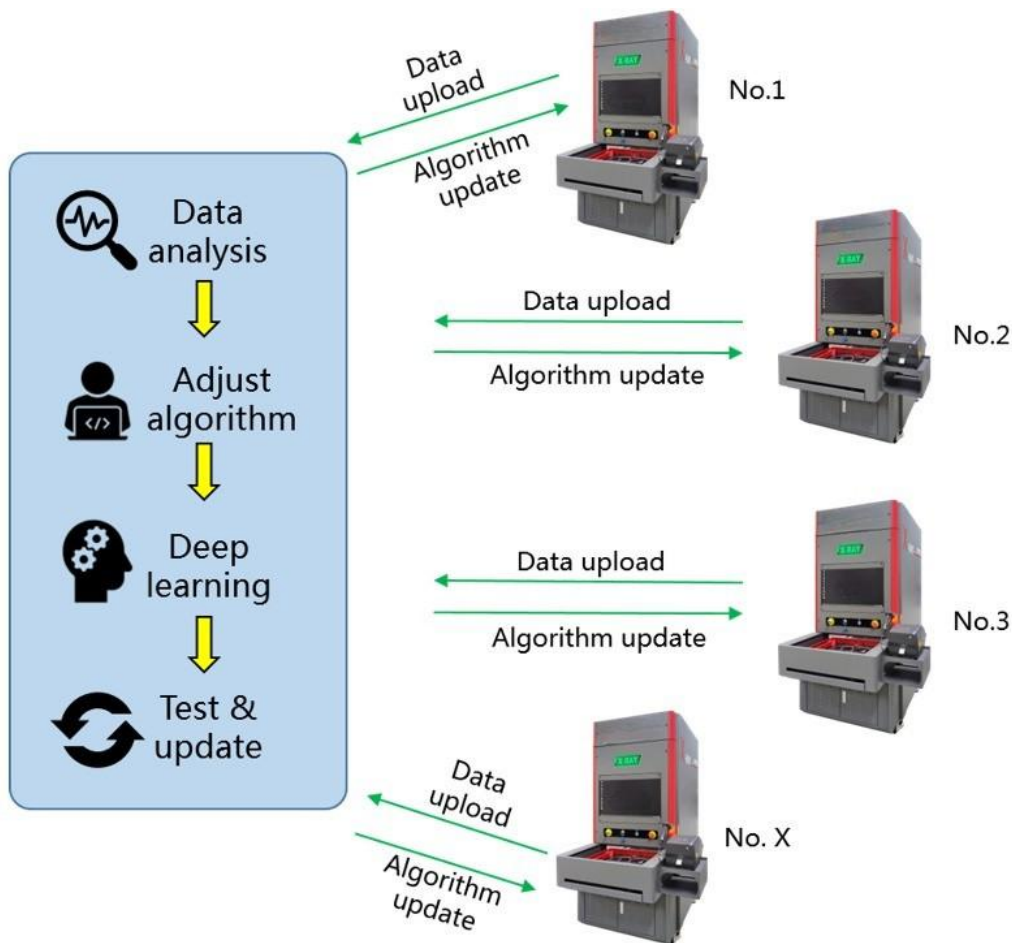
1. Aspect ratio
2. The angle of each corner of the component;
3. Slope between components from inside to outside;
4. Deformation of component images from the inside to the outside, etc.

As the number of components counting increases, the results become more and more accurate. When we need to count similar components, or larger trays, we can easily handle it.



6. Cloud database

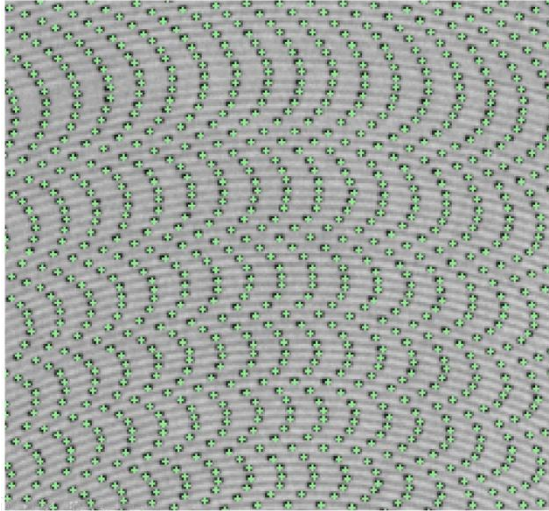
Every Wellman X-ray counter can connect to our cloud database. The data and images of the machine will be uploaded to the cloud, and the machine will automatically download the latest database. Our engineers also optimize the algorithm in the background according to the images and data collected by each machine, and regularly update it to the database for customers.



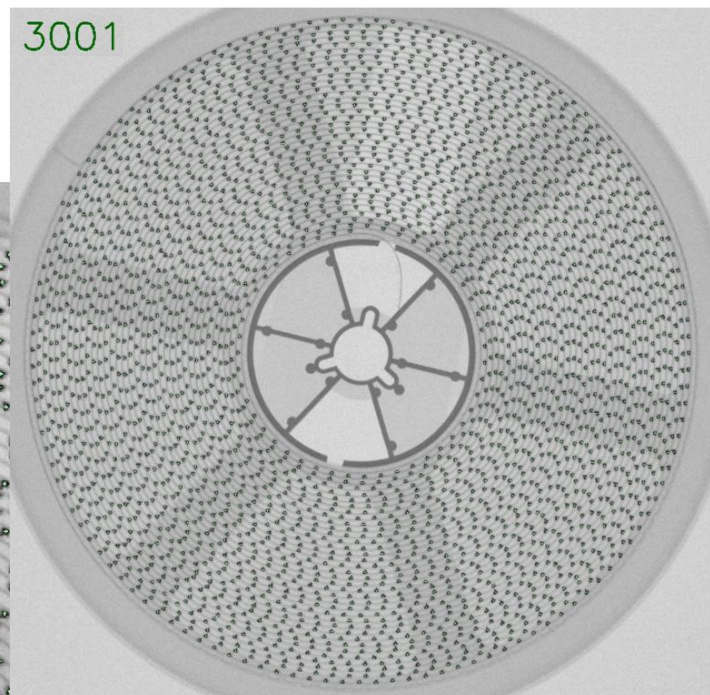
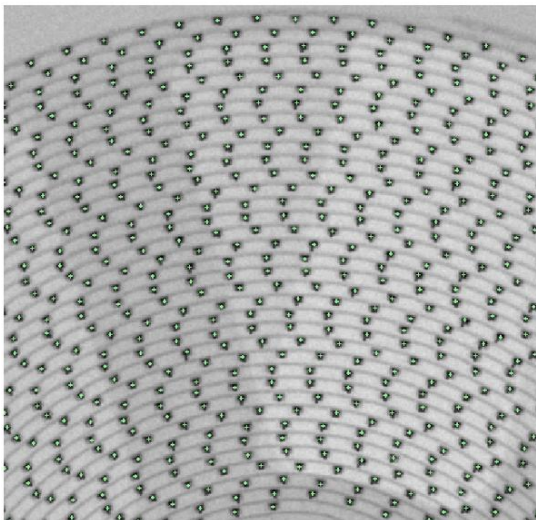
Over time, the accuracy of counting will be closer to 100%, and the coverage of component types will become wider and wider. When a machine counts a new kind of component, if the data of this kind of component is stored in our database, our software can directly call the data, which brings users higher efficiency, accuracy and coverage.

7. Sample images

01005 Full Reel

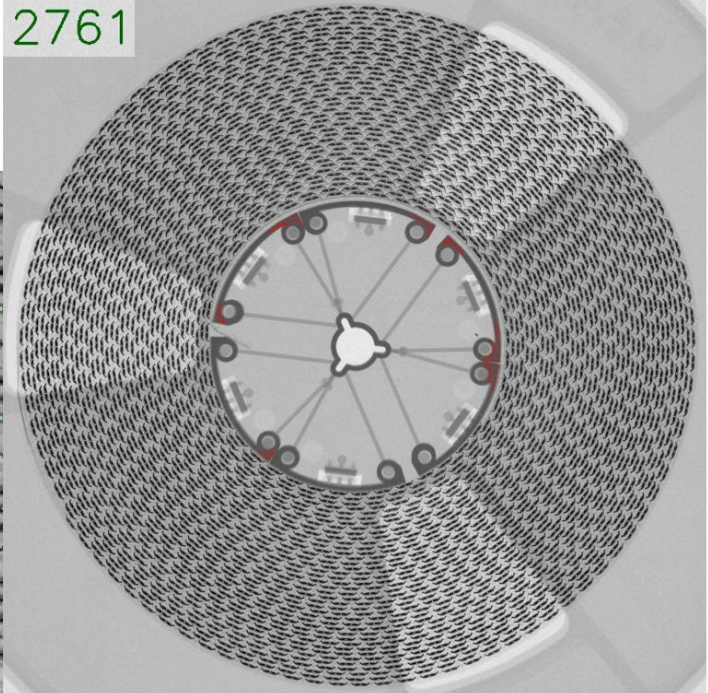
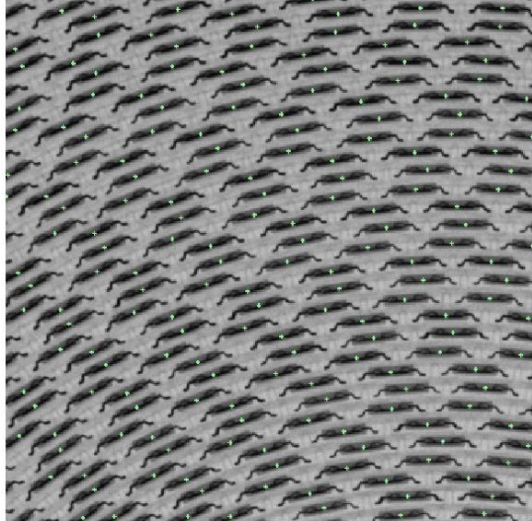


0201 Full Reel



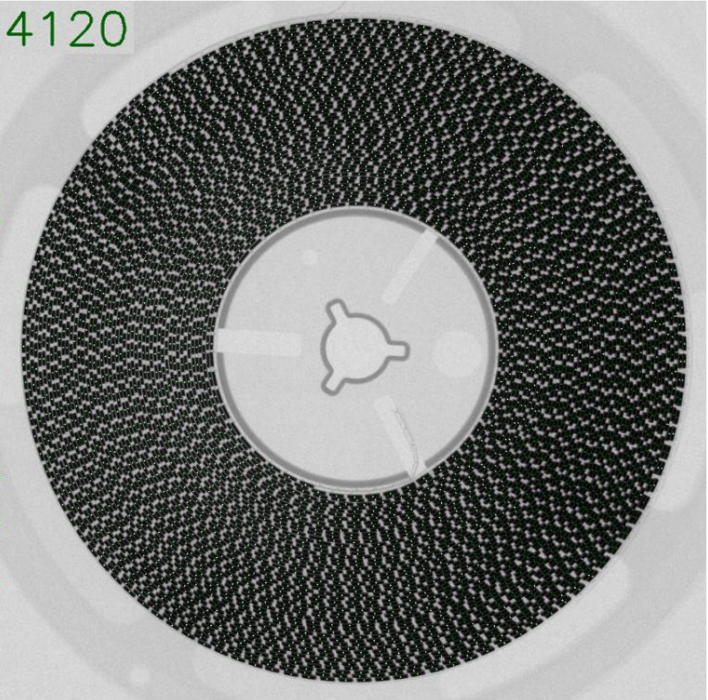
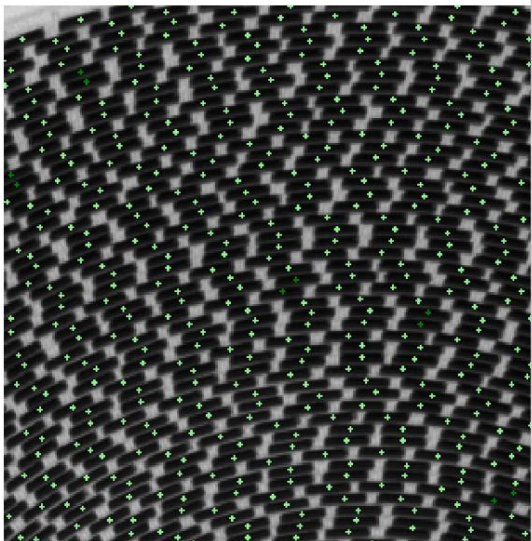
Complex tall parts

2761



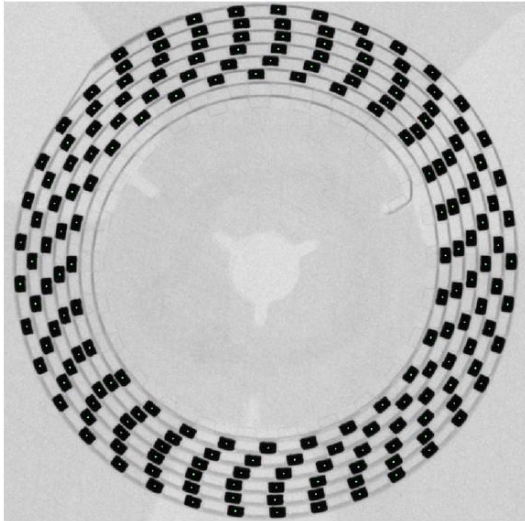
Overlapped chips

4120



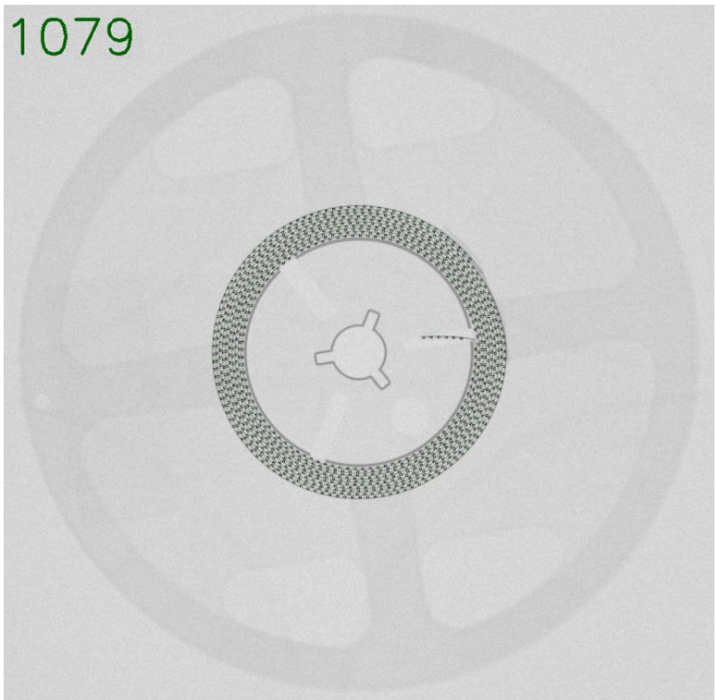
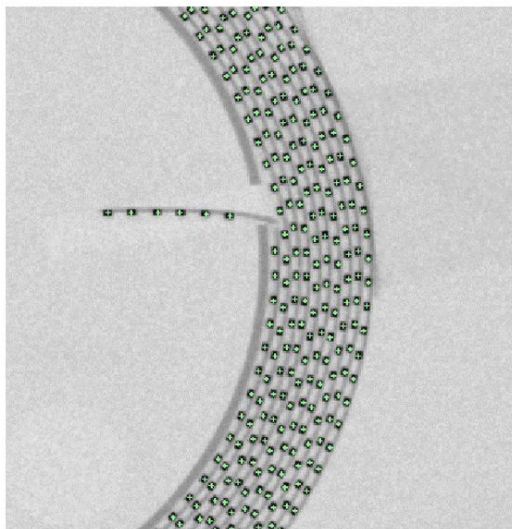
Small amount parts

188



Scattered Chips

1079



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VENTAS@SOLUCINDE.COM

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88780

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Texas 78557



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