DBX-1000

Die attach

KAIJO CORPORATION
Bonding Machinery Div.

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1. Comparison

		KAIJO , DBX-1000	Competitor "A"
Cycle time (Without process)		0.18 sec	0.165 sec
Accuracy	XY	±25μm (3σ)	±25μm (3σ)
	θ	±3° (3σ)	±3° (3σ)
Die size		□0.15 ~ 1.5 mm (□0.1 mm and □3.2mm, Available)	□0.1 ~2.0 mm
Lead frame	L	90 ~230 mm (MAX 300 mm : Option)	50 ~260 mm (MAX 300 mm : Option)
	W	20~100 mm	20 ~110 mm
	H	0.1 ~ 2.0 mm	0.1 ~ 3.0 mm
Magazine	L	95~235 mm (MAX 300mm : Option)	50 ~ 260 mm
	W	30~110 mm	20 ~ 110 mm
	H	100~1750 mm	50 ~ 200 mm
Wafer size		4 inch (6 /8 inch : Option)	Max 8 inch
Stamping unit		Single unit / Single disc	Double unit / Double disc
Bonding force		30~180g (Digital setting)	
Recognition mode		Multilevel image	
Dimension（W x D x H)		1750 x 1080 x 2050	1,600 mm x 1,130 mm x 1,630 mm (Exclude Light tower)
Weight		880 Kg	1,200 Kg

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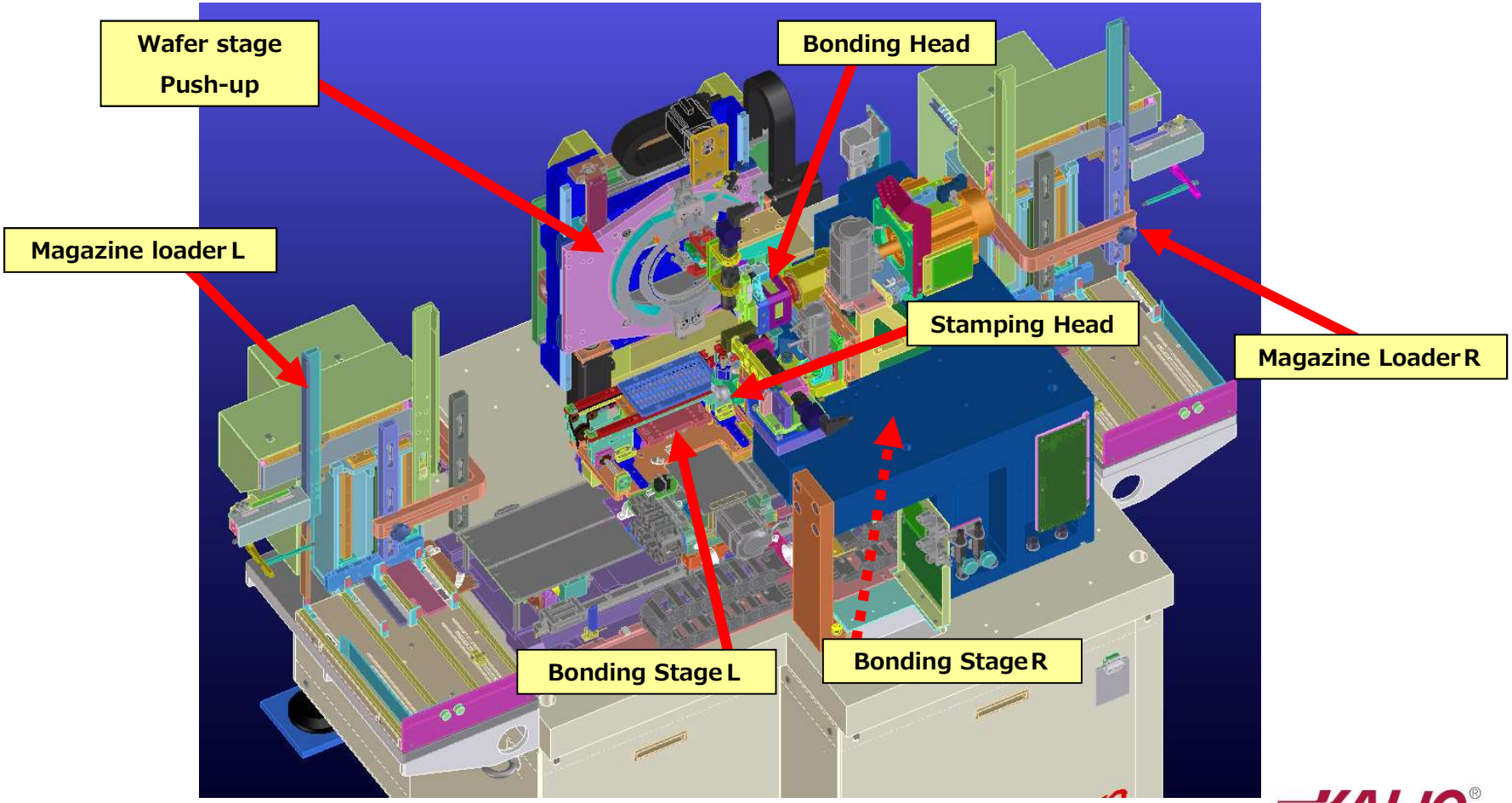
2. Framework -- Overview --

・Simple framework to get easy maintenance.
・By placing the wafer vertically, Space saving and improve workability.



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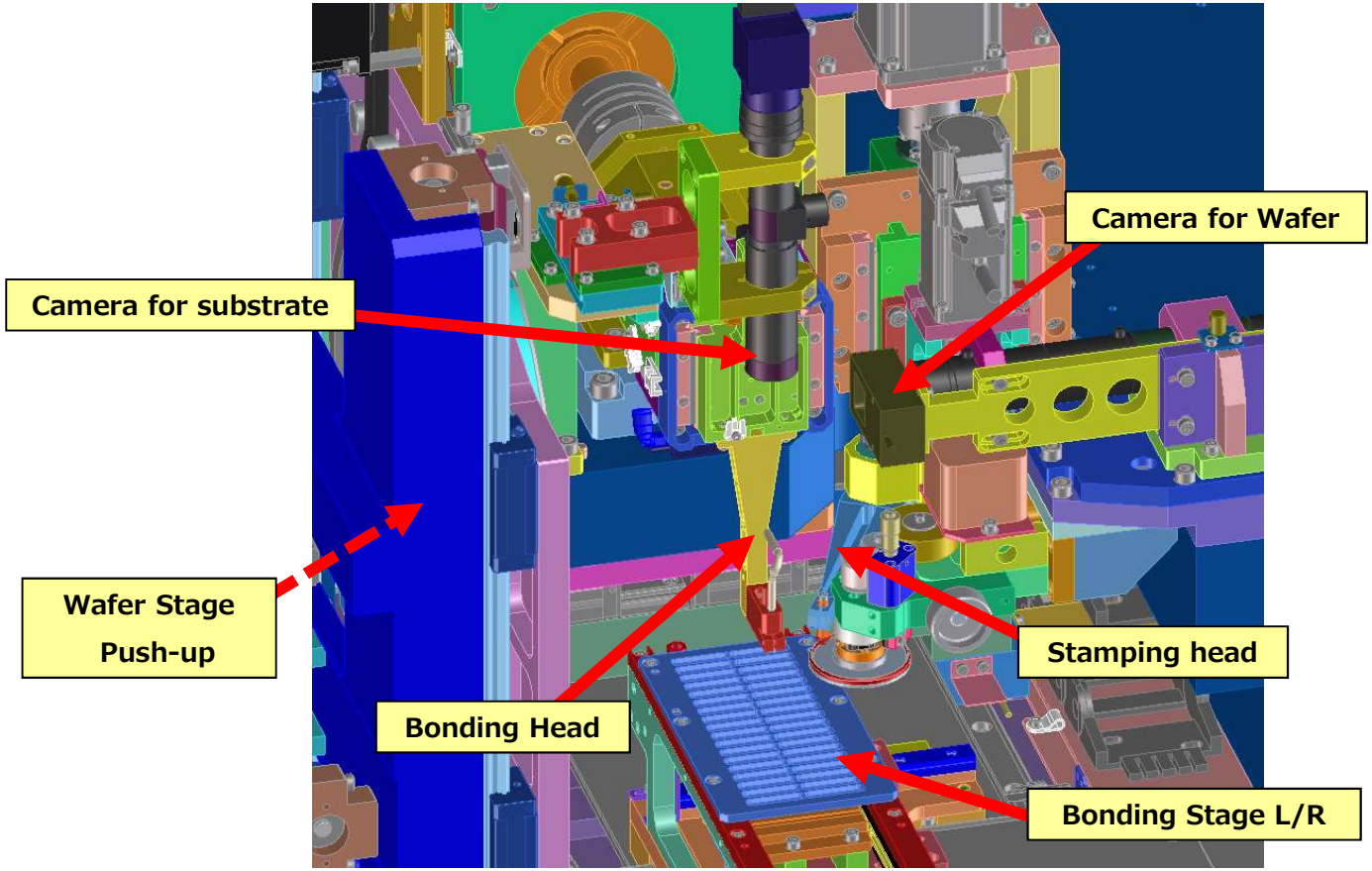
2. Framework -- Around bonding head --

・Since bonding and stamping are controlled under the same recognition data, stable quality can be maintained.



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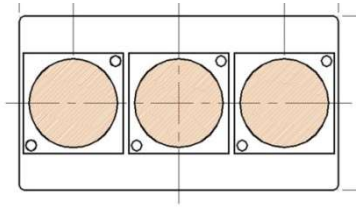
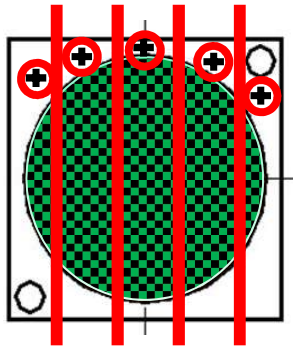
3. Features -- Easy recipe teaching and Maintain position accuracy --

Most of Competitor's bonder has gripper/pin feeding,

DBX-1000 has bonding stage which can be moved X-Y direction freely.

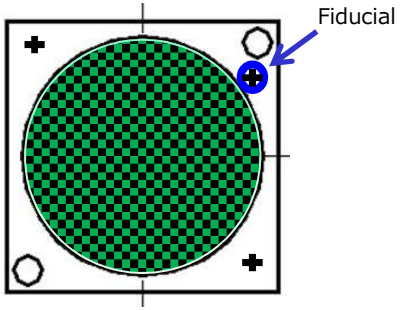




Competitor's bonder (Area must be separated into several part)

*The bonding area in 1 pitch feeding is limited, so set the Bonding coordinate for each separated part is needed.

*Alignment teaching for each part, and alignment point in each area is necessary.



DBX-1000 (Whole area bondable)

*Just 1 alignment point is able to cover the all area.
*Position shifting of bonding can be minimized due to no feeding.
*Since the same recognition point is used, there is no misalignment between the paste and the chip due to recognition.

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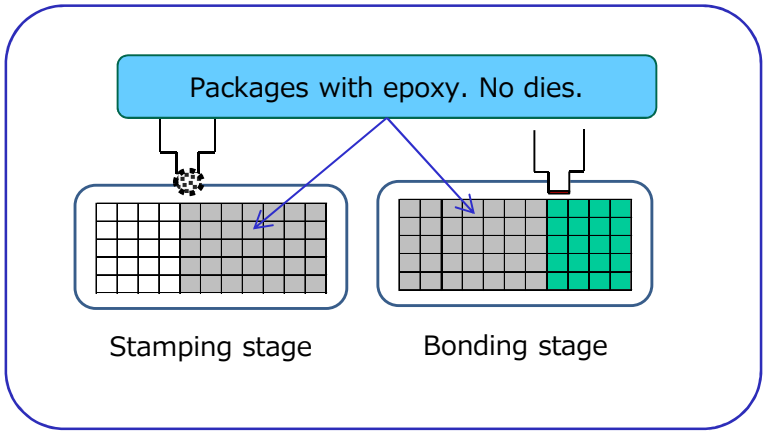
3. Features -- Minimize Epoxy deterioration and Reducing material loss --

A case of "Competitor A" with each stages in Bonding and Stamping respectively.

・Since the time from stamping to bonding varies from chip to chip, drying and hardening progress due to variations in the amount of applied quantity and the type of epoxy, which tends to cause unstable dies share strength.

・If it takes a long time to recover due to any trouble, the stamped epoxy will be harden.

・It takes time to setting and adjustment each on the stamping and the bonding to recover it.



The packages with epoxy but no dies left over, it may cause quality variability waste of materials.

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3. Features -- Minimize Epoxy deterioration and Reducing material loss --

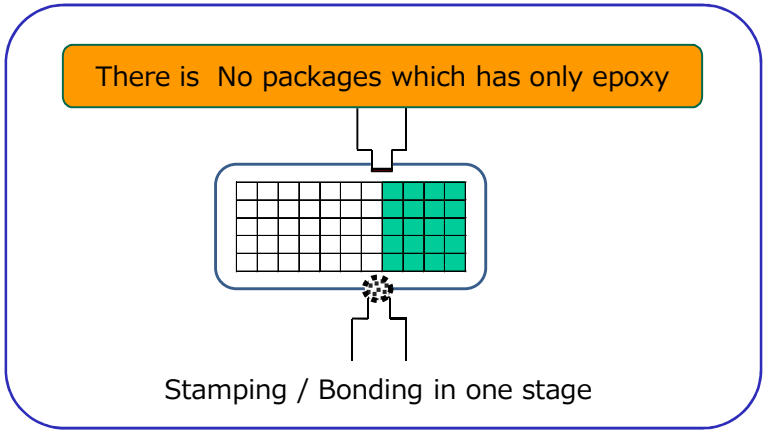
A case of “KAIJO DBX-1000”

・Since stamping and bonding are performed on the same stage, bonding is done immediately after stamping. By this process reduces the amount of stamped packages that harden even if trouble occurs.

・Since the time from stamping to bonding is the same for all dies, it contributes to stable quality.

・Easy setting when you try recovery, since the running can be resumed from the next die of bonding.

・Depending on the epoxy, hardening may progress immediately after stamping, and the epoxy may not stick to the side of the die. In a single stage, you have more options to select epoxy.



Even in the trouble, the impact on quality and the quantity of wasted materials can be minimized.

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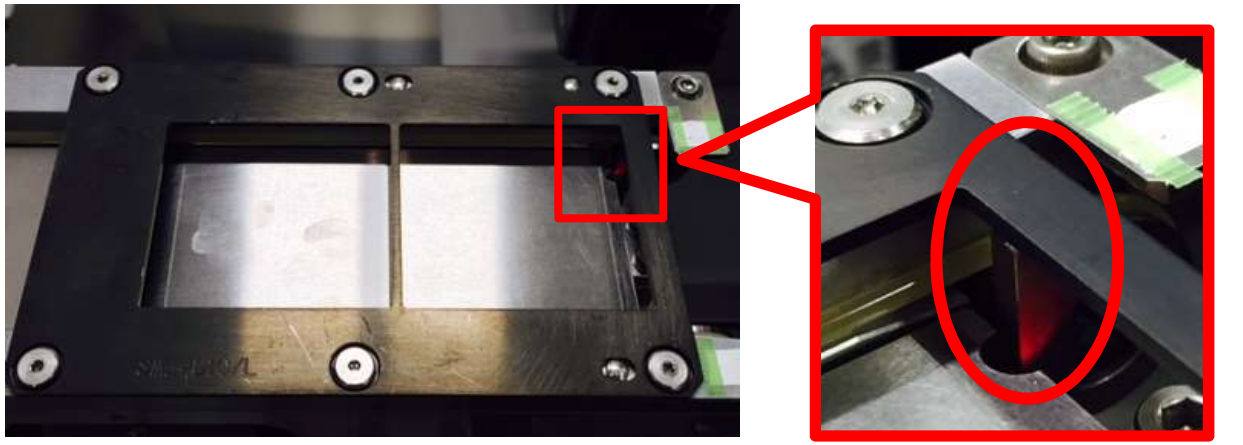
3. Features -- Repair --

If an error occurs, the operator removes the substrate and removes the die. The substrate is returned to the bonder, repair-bonded, and then restarted.

KAIJO bonder makes it easy to return the substrate to the bonder.



When returning the substrate, you can restart it by turning the belt, deciding the position with the stopper, and then raising the bonding plate.

In the case of multi-stage specifications such as competitors, it is difficult to put it back in its position when you return the substrate to the carrier, so it will have to be reinserted from the loader. Also, there are still frames in the stamping area that you are working on, so you will have to wait for the bonding to finish.

The DBX-1000 is easy to put in and take out even during bonding.

3. Features -- Bonding coordinates --

Coordinate data can be easily set even with various die attach arrangements.

You can either key-in the bonding coordinates directly or using the loading tool.

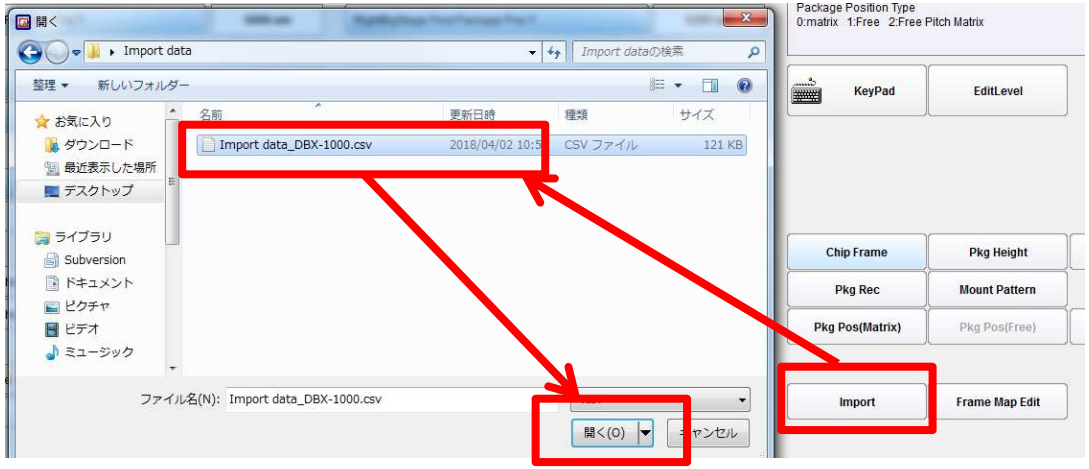
Just copy the coordinate data to the Import tool, create a CSV file, and then load it into the bonder.

(Import tool = Excel file)

Import file (Excel)
With Bonding coordinates

	A	B	C	D	E
1	項目	Min	Max	Pattern1	Pattern2
2	Free Mount Position Points	1	1500	42	1
3				※Yの範囲は±12000	
4	項目	Min	Max	Pattern 1	
5				X	Y
6	Free Mount Pos 1 X/Y/Q	-280000	280000	-5000	0
7	Free Mount Pos 2 X/Y/Q	-280000	280000	-4500	0
8	Free Mount Pos 3 X/Y/Q	-280000	280000	-4000	0
9	Free Mount Pos 4 X/Y/Q	-280000	280000	-3500	0
10	Free Mount Pos 5 X/Y/Q	-280000	280000	-3000	0
11	Free Mount Pos 6 X/Y/Q	-280000	280000	-2500	0
12	Free Mount Pos 7 X/Y/Q	-280000	280000	-2000	0
13	Free Mount Pos 8 X/Y/Q	-280000	280000	-1500	0
14	Free Mount Pos 9 X/Y/Q	-280000	280000	-1000	0
15	Free Mount Pos 10 X/Y/Q	-280000	280000	-500	0
16	Free Mount Pos 11 X/Y/Q	-280000	280000	0	0
17	Free Mount Pos 12 X/Y/Q	-280000	280000	500	200
18	Free Mount Pos 13 X/Y/Q	-280000	280000	1000	400
19	Free Mount Pos 14 X/Y/Q	-280000	280000	1500	600
20	Free Mount Pos 15 X/Y/Q	-280000	280000	2000	800
21	Free Mount Pos 16 X/Y/Q	-280000	280000	2500	1000
22	Free Mount Pos 17 X/Y/Q	-280000	280000	3000	1200
23	Free Mount Pos 18 X/Y/Q	-280000	280000	3500	1400
24	Free Mount Pos 19 X/Y/Q	-280000	280000	4000	1600
25	Free Mount Pos 20 X/Y/Q	-280000	280000	4500	1800
26	Free Mount Pos 21 X/Y/Q	-280000	280000	5000	2000
27	Free Mount Pos 22 X/Y/Q	-280000	280000	-5000	2000
28	Free Mount Pos 23 X/Y/Q	-280000	280000	-4500	2000
29	Free Mount Pos 24 X/Y/Q	-280000	280000	-4000	2000
30	Free Mount Pos 25 X/Y/Q	-280000	280000	-3500	2000
31	Free Mount Pos 26 X/Y/Q	-280000	280000	-3000	2000
32	Free Mount Pos 27 X/Y/Q	-280000	280000	-2500	2000
33	Free Mount Pos 28 X/Y/Q	-280000	280000	-2000	2000
34	Free Mount Pos 29 X/Y/Q	-280000	280000	-1500	2000
35	Free Mount Pos 30 X/Y/Q	-280000	280000	-1000	2000

Easy input and operation



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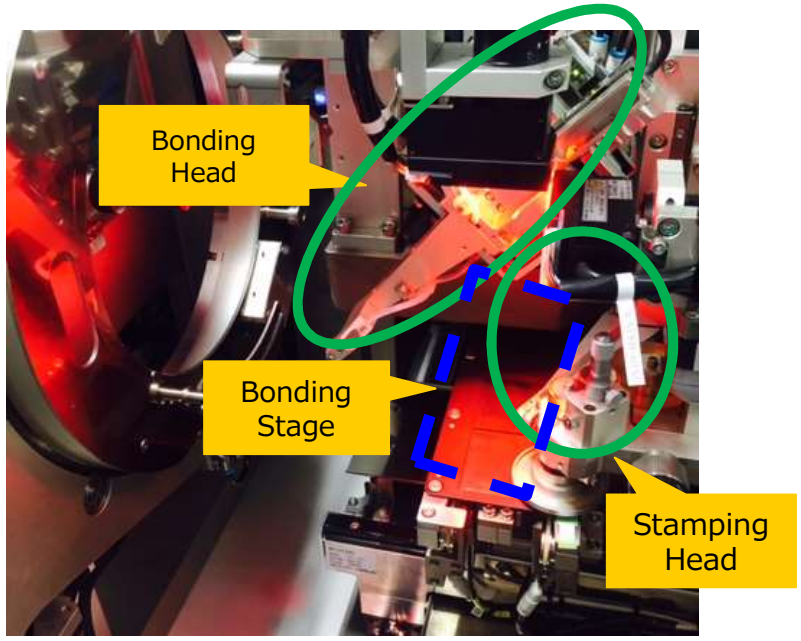
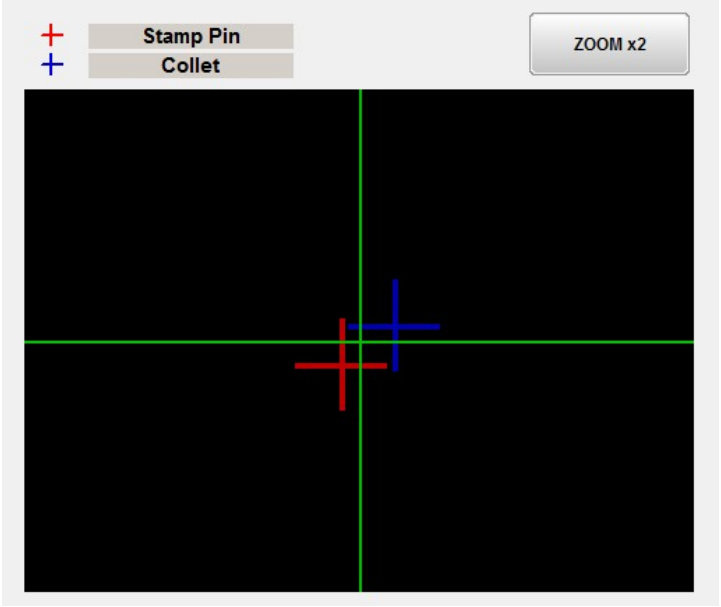
3. Features -- CTD (Camera Tool Distance) --

Simple mechanism with less adjustment.



Camera image of Bonding Stage.

Teaching is easy because the stamp pin and collet CTD are aligned with one camera.



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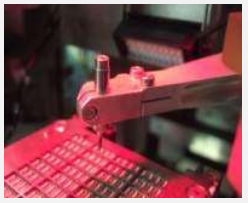
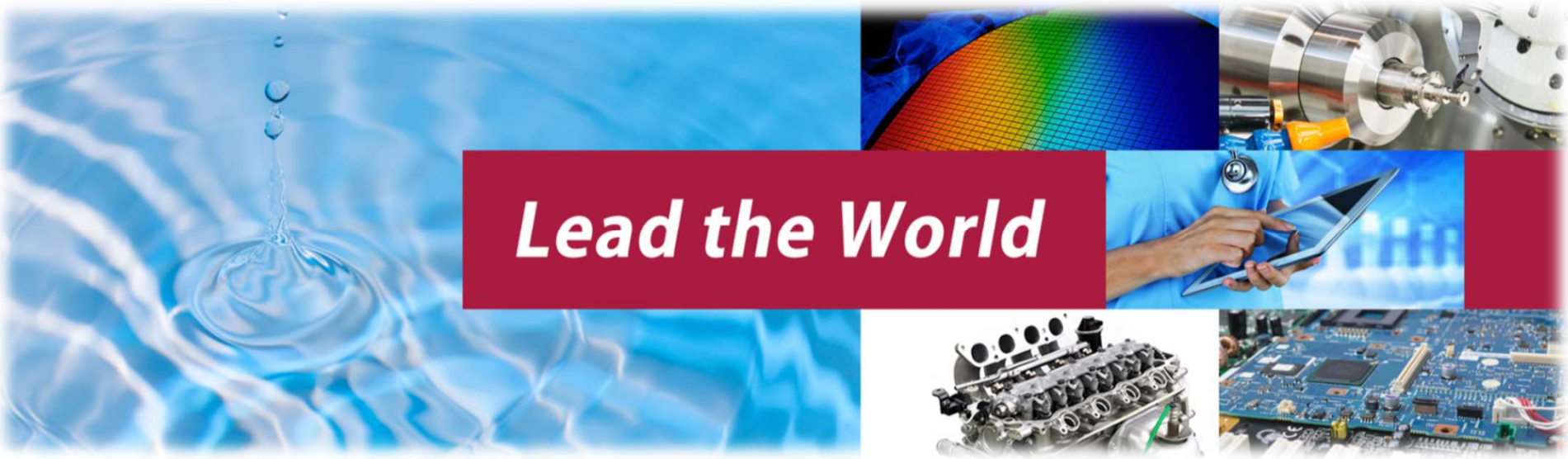
4. Options

Option Item	Description	Remarks
Wafer Changer 	For wafer ring (6 inch wafer) ※Wafer expander must be combined	Disco Ring applicable as well. Specification need to be confirmed in case of other than Disco ring.
Wafer Expander 	For wafer ring (6 inch wafer)	Disco Ring applicable as well. Specification need to be confirmed in case of other than Disco ring.
300mm length frame/substrate	Feeding direction is from left loader to right loader(One way) Magazine size up to 280mm. L/R bonding stage can be extended according to substrate length.	One way feeding is applicable if the substrate in standard length.
Rotary bonding head 	Apply to angle bonding	
Adjustment mechanism for multiple pins 	For 2 or more pins, prevent variations in the amount of epoxy for each pin.	



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New

高精度・高生産性かつ
快適な操作性を実現
LED向けフルオートダイボンダ

High speed, High accuracy
and User-friendly operation
LED Die Bonder

DBX-1000 の特長

- 高速・高精度エポキシダイボンダ
- スタンピング及びボンディングヘッドのデジタル化
- ボンディング加重のデジタル化

Features of DBX-1000

- High speed & accuracy Epoxy Die Bonder
- Epoxy, Bonding head digital programmable
- Digitalized bonding force

DBX-1000 Fully Automatic Epoxy Die Bonder

■主な仕様

ボンディングシステム	エポキシ接合
ボンディングスピード	0.18秒/サイクル(プロセス時間含まず)
ボンディング繰り返し精度	位置:±25μm(3σ) 角度:±3°(3σ)
ボンディング範囲	X:220mm　Y:92mm
ボンディング加重	30～180g
チップサイズ	□0.15～□1.5mm
リードフレームサイズ	長さ　:90～230mm 幅　:20～100mm 厚さ　:0.1～2mm
マガジンサイズ	長さ　:95～235mm 幅　:30～110mm 高さ　:100～175mm ストック数　:2～3マガジン
ウエハサイズ	4インチ用グリップリング(外形φ152mm) 6インチ用グリップリング(外形φ210mm)/OP
基本OS	Windows 7 Embedded
エアー	0.4Mpa(4Kgf/cm^2)以上 (消費量:30ℓ/min)
電源	単相　AC200～240V　50/60Hz
消費電力	0.9KVA
外観寸法	W1750×D1080×H2050mm (警告灯含む)
重量	930kg

■SPECIFICATIONS

Bonding System	Epoxy resin
Bonding Speed	0.18sec/cycle(Dry run)
Repeatability of Bonding Accuracy	Position:±25μm(3σ) Angle:±3°(3σ)
Bonding Area	X:220mm　Y:92mm
Bonding Force	30～180g
Chip Size	□0.15～□1.5mm
Lead Frame Size	Length　:90～230mm Width　:20～100mm Thickness　:0.1～2mm
Magazine Size	Length　:95～235mm Width　:30～110mm Height　:100～175mm No.of Stock　:2～3 Magazines
Wafer Size	Grip ring for 4 inch wafer (Outer φ152mm) Grip ring for 6 inch wafer (Outer φ210mm)/OP
Operation System	Windows 7 Embedded
Air	0.4Mpa(4Kgf/cm^2) or more (Consumption:30ℓ/min)
Power Source	AC200～240V　50/60Hz
Power Consumption	0.9KVA
Overall Dimensions	W1750×D1080×H2050mm (Including indicating lamp)
Weight	930kg

⚠ 安全に関する注意:商品を安全にお使いいただくため、ご使用前に必ず「取扱説明書」をよくお読み下さい。
●カタログ上の注意・・・カタログ掲載商品の仕様及び外観は、改良のため予告なく変更することがありますので、あらかじめご了承ください。

⚠ CAUTION FOR SAFE:Please read surely INSTRUCTION MANUAL before operate.
●Specification is subject to change without prior notice for improvement.

KAIJO® KAIJO CORPORATION URL:http//www.kaijo.co.jp

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OVERSEAS DISTRIBUTOR

Specifications

Die Bonder

Machine Model **DBX-1000**

Epoxy Die Bonder

Second Edition 2013.11.24

Note)

1. Standard specifications are contained in this manual.
2. Contents in this manual are subject to change for better capabilities without notice.

KAIJO CORPORATION
Bonding Machinery Division

Contents

1. Machine name: Fully automatic die bonder

2. Model : **DBX-1000**

3. Overview

This is the epoxy die bonder for production of LED devices.
The eject pin thrust up a diced chip on a wafer sheet, the collet suctions the chip and bonds the chip on a frame epoxy stamped.

Two bonding stages operate alternately reduces time for exchanging frames. The bonding stages are movable X and Y expands bonding area applicable for various bonding pattern.

The belt transfer system for frame exchange of the bonding stage allows for ceramic board bonding.
Two bonding stages have magazine changers each, which store frames fed in to an original magazine. Each magazine changer stores two or three magazines.

VCM controls the bonding arm direct operating mechanism makes positioning/weight controls easy and improves maintenance performance.
The digital settable collet load is set at the Pickup side and the Mount side each.
Micro flow sensor detects pickup and mount errors.

The ejecting pin thrust up chips in two steps prevents damage.
Any tools are unnecessary in order to replace consumable eject pin.
The algorithm that is to recognize nine chips at once on a wafer sheet improves recognition speed prevents small chips pickup miss.
Also, bad marks and cracks are detected.

4. Work specifications

Chip size	0.15～1.5mm
Lead frame size	Length 90 - 230mm Width 20 - 100mm Thickness 0.1 - 2mm (3mm margin in both widths are necessary for transfer.)
Magazine size	Length 95 - 235mm Width 30 - 110mm Height 100 - 175mm (2 or 3 magazines are stored.)
Wafer size	Standard 4 inch grip ring (6 inch grip ring is available optionally)

5. Machine specifications

Bonding methods	Epoxy bonding (stamping method)
Bonding speed	0.18sec/cycle (Dry run) (Process time is not included.)
Bonding position accuracy	XY repeating position Plus/minus 25um (3sigma) Theta repeating angle Plus/minus 3 degrees (3sigma) (KAIJO standard sample)
Bonding load	30 -180g (Voice coil)
Transfer method	Double bonding stage shuttle method Magazine changer (2 or 3 magazines are stored.)
Transfer base	Back rail
Recognition unit	Multi level or binary pattern matching. Lead: One point detection up to four points. Chip: One chip mode or nine chips mode Outer detection or pattern matching Detection function (Inspection item) Agent: Position, area, size, tail Chip: Position (X, Y, Theta), size, brightness
MTBA	1 hour or more
Operation system	Windows 7 Embedded (Microsoft Corporation ®)
Setting environment	Temperature 15 - 30 degrees C Humidity 50 % - 55%RH Cleanliness ISO 8 (FED 100,000) or more
Compressed air	Pressure 0.4 Mpa (4kgf/cm2) or more Consumption 30 L/min Connecting port φ6
Power voltage	Single phase AC200 - AC240V 50/60Hz Consuming power: 2.5KVA Grounding : D class grounding
Color	Pale gray
Dimension	W 1750 × D 1080 × H 2050 (including the warning light)
Weight	930kg

6. Unit specifications

1) Bonding Head

[Z-axis]

Drive method	: VCM linear motor
Resolution	: 1um/P

Stroke : 10mm

[Theta-axis]
Drive method : AC servo motor
Resolution : 0.005 degrees/P
Stroke : 90 degrees

2) Stamping Head

[Z-axis]
Drive method : AC servo motor + Ball screw
Resolution : 1um/P
Stroke : 20mm

[Theta-axis]
Drive method : AC servo motor + Cam
Stroke : 15 degrees

3) Epoxy Disk

Drive method : Stepping motor
Resolution : 0.09 degrees /P
Rotation speed : 10rpm - 100rpm

4) Bonding Stage

[X-axis]
Drive method : AC servo motor + Ball screw + External encoder
Resolution : 1um/P
Stroke : 500mm

[Y-axis]
Drive method : AC servo motor + Ball screw + External encoder
Resolution : 1um/P
Stroke : 100mm

[Feeder]
Drive method : Stepping motor + Belt
Resolution : 0.1492mm/P

[Plate Up/Down]
Drive method : Cylinder

5) Wafer Stage

[X-axis]
Drive method : AC servo motor + Ball screw
Resolution : 1um/P
Stroke : 200mm

[Y-axis]
Drive method : AC servo motor + Ball screw

Resolution : 1um/P
Stroke : 200mm

[Theta-axis]
Drive method : AC servo motor + Belt
Resolution : 0.01 degrees/P
Stroke : 360 degrees

6) Eject Pin

Drive method : AC servo motor + Cam
Resolution : 0.19um/P
Stroke : 2.7mm (Evacuation:10mm)

7) Loader

[Elevator、Front Guide、Rear Guide、Side Guide]
Drive method : Stepping motor + Screw

[Frame Input Pusher、Magazine Output Pusher]
Drive method : Cylinder

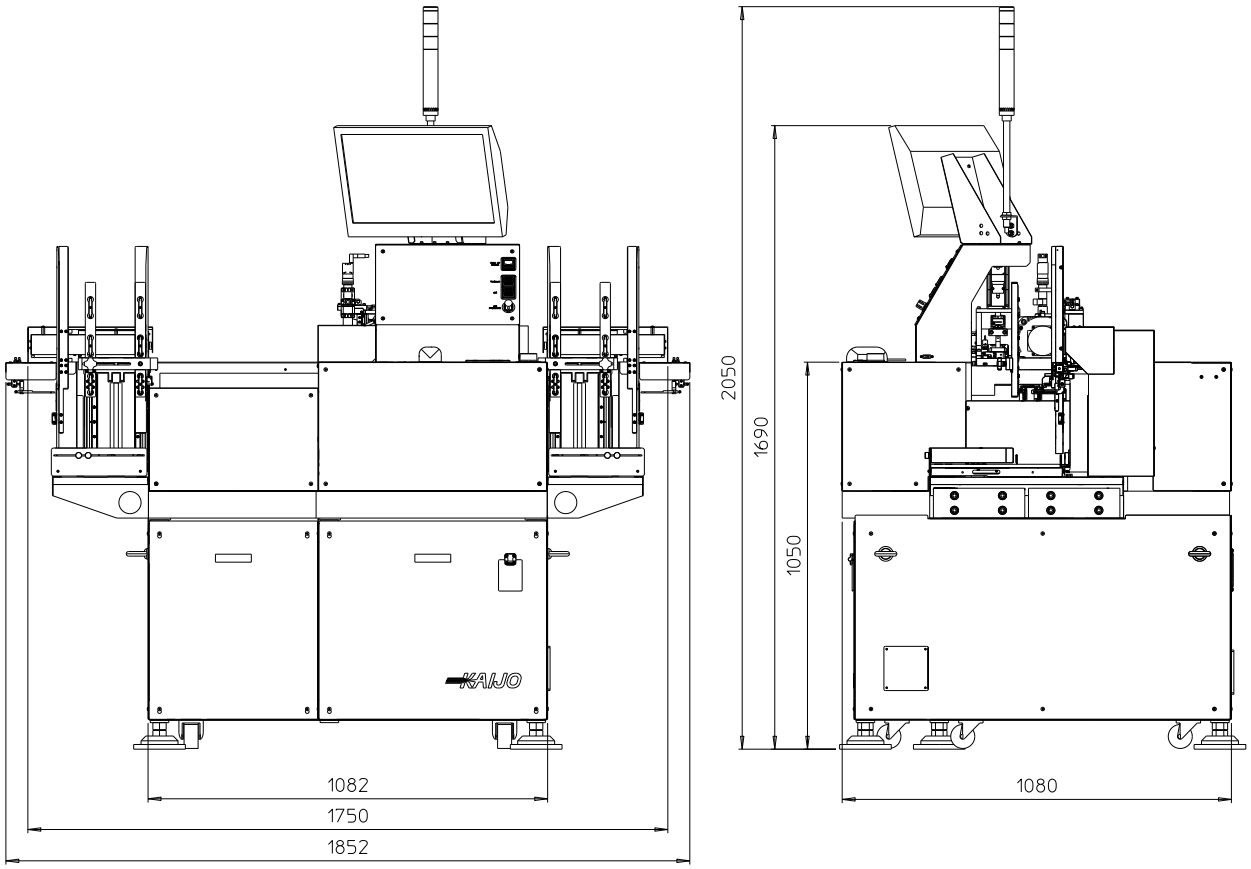
8) Camera Unit

[Lead Frame]
Lens magnification : x2
Detection resolution : 1um
Lamp : Coaxial lamp (Red or Blue)
: Oblique lighting (OP) (Red or Blue)

[Wafer]
Lens magnification : x0.5 - 4 (Zoom lens)
Detection resolution : 3.8～0.5um
Lamp : Coaxial lamp (Red or Blue)
: Oblique lighting (OP) (Red or Blue)

Note)
(1) Standard specifications are contained in this manual.
(2) Contents in this manual are subject to change for better capabilities without notice.

7. Appearance



Warranty

Please ask our service staff near you in case damages or malfunctions under normal use.
We provide you free-of charge repairs in accordance with our guarantee conditions.

(1) For newly purchase of machines:
Within the 1 year limited warranty period from the date of receiving inspection, or
Within the 1 year and 1 month limited warranty period from the shipping date on Bill of Lading.

(2) For newly purchase of parts:
Within the 7 months limited warranty period from the shipping date from our company.

(3) For repairs:
Within the 4 months limited warranty period from the shipping date from our company.

(3-1) For repairs failures identified:
Repairs other than the same failures in the same spot will be charged.

(3-2) For repairs failures are not identified:
The coverage for overhaul or overall inspection is accordance with a contract agreement.

Note 1. Repairs fall into the category below will be charged within the warranty period.

(1) Damages in transit or inappropriate handling by customer.

(2) Damages by fire/natural disaster/abnormal voltage.

(3) Damages due to conversion/repair/adjustment by customer.

(4) Damages caused by connecting to apparatus other than KAIJO Bonding Machine.

(5) Natural wear/tear/deterioration in normal use; consumables such as lights/heaters are included.

Note 2. Maintenance period
(1) Machines past 7 years after the acceptance are not included.

(2) We may have to decline to supply maintenance parts depending on availability or inventory status during the maintenance period.

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