



# SAIL TECHNOLOGY

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Break technology monopoly, replace imported products

Located in Suzhou industrial park , Suzhou Sail Science & Technology Co., Ltd is a high-tech corporation specialized in research, development, production and sales of ultra precision diamond and CBN tools used in the industry of semiconductor.

EXPLORE



## About us

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Suzhou Sail Science & Technology Co., Ltd has always been concerning about the development of new products and breakthrough in new technologies, so as to continuously improve the core competitiveness of the company's products.



## Our story

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Suzhou Sail Technology has passed ISO9001:2008 quality system certification. In addition, it has been awarded as "High-tech Enterprises" , "Small and Medium Enterprises" in Jiangsu Province" , "Suzhou Engineering and Technology Center" and a number of products had obtained the honorary title of "New High-tech Products" .

# OUR PRODUCTS

## SAIL TECHNOLOGY



### METAL BLADE

- 1.1. [INTRO & SPECS](#)
- 1.2. [CSP](#)
- 1.3. [BGA](#)
- 1.4. [Glass](#)

[LEARN MORE](#)



### RESIN BLADE

- 2.1. [INTRO & SPECS](#)
- 2.2. [QFN](#)
- 2.3. [Ceramics](#)
- 2.4. [Experiments](#)

[LEARN MORE](#)



### GRINDING WHEEL

- 3.1. [INTRO & SPECS](#)
- 3.2. [Application](#)
- 3.3. [LED substrate](#)

[LEARN MORE](#)



### HUB BLADE

- 4.1. [INTRO](#)
- 4.2. [SPECS](#)
- 4.3. [Wafer cutting](#)
- 4.4. [Graphical exhibition](#)

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### HUBLESS BLADE






- 5.1. [INTRO & SPECS](#)
- 5.2. [Samples](#)
- 5.3. [Application](#)
- 5.4. [Graphical exhibition](#)

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METAL BOND BLADE

M1A SERIES

SPECIFICATIONS

C	SD	400	N	50	MS07T	58	0.3	40
Basic shape	Grit type	Grit size	Hardness	Concentration	Bond	O.D.	Thickness	I.D.
1A8  1E8  1M8  1N8  1V8 	SD : Synthetic Diamond SDC : Coated Synthetic Diamond BC : Coated CBN	320 #320 360 #360 400 #400 500 #500 600 #600 800 #800 1000 #1000 1200 #1200 1500 #1500 1700 #1700 2000 #2000	H : High L : Low N : Medium	125 100 75 50 25 High Low	MS09T MS07T	Tolerance : 0/0.05	Tolerance : -0.005 /+0.005	Tolerance : +0.01/+0.03

METAL BOND BLADE

M1A SERIES

PROCESSING DATA

The comparison shows the tendency of the process result when a dresser board is cut. Depending on the cutting conditions and type of material, actual results may be vary. Therefore, these values are for reference only.

Comparison Of Cutting Efficiency For Bond Types

Bond								
FT10	MS09T1D	MS07T2	MR0207	MR0209	TP7512	MS09T	MS07PB	MS09P
						Wear-out faster		

# M1A SERIES

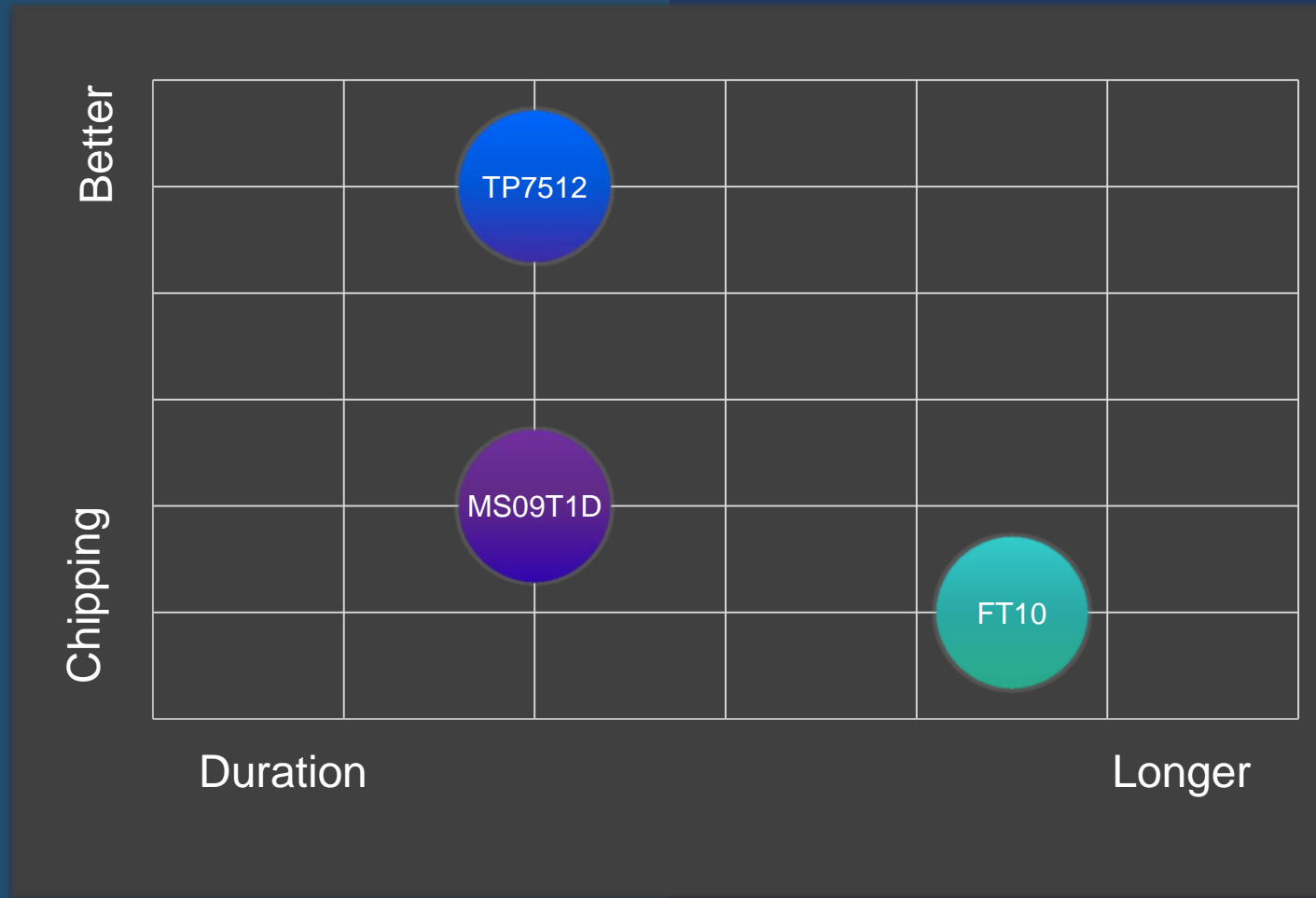
GRIT								
4000#	3000#	2000#	1500#	1200#	600#	400#	320#	240#
Single Crystal Ferrite				Quartz Soda Glass				
Compound Materials				$Al_2O_3$				
$TiO_2$				BGA				
CSP								

METAL BOND BLADE

# CSP DICING BLADE

## Features

- Ultra thin & precision
- Good shape keeping ability
- High rigidity to minimize wavy and slant cutting
- Perfect chipping quality
- High cutting speed
- Long duration



## METAL BOND BLADE

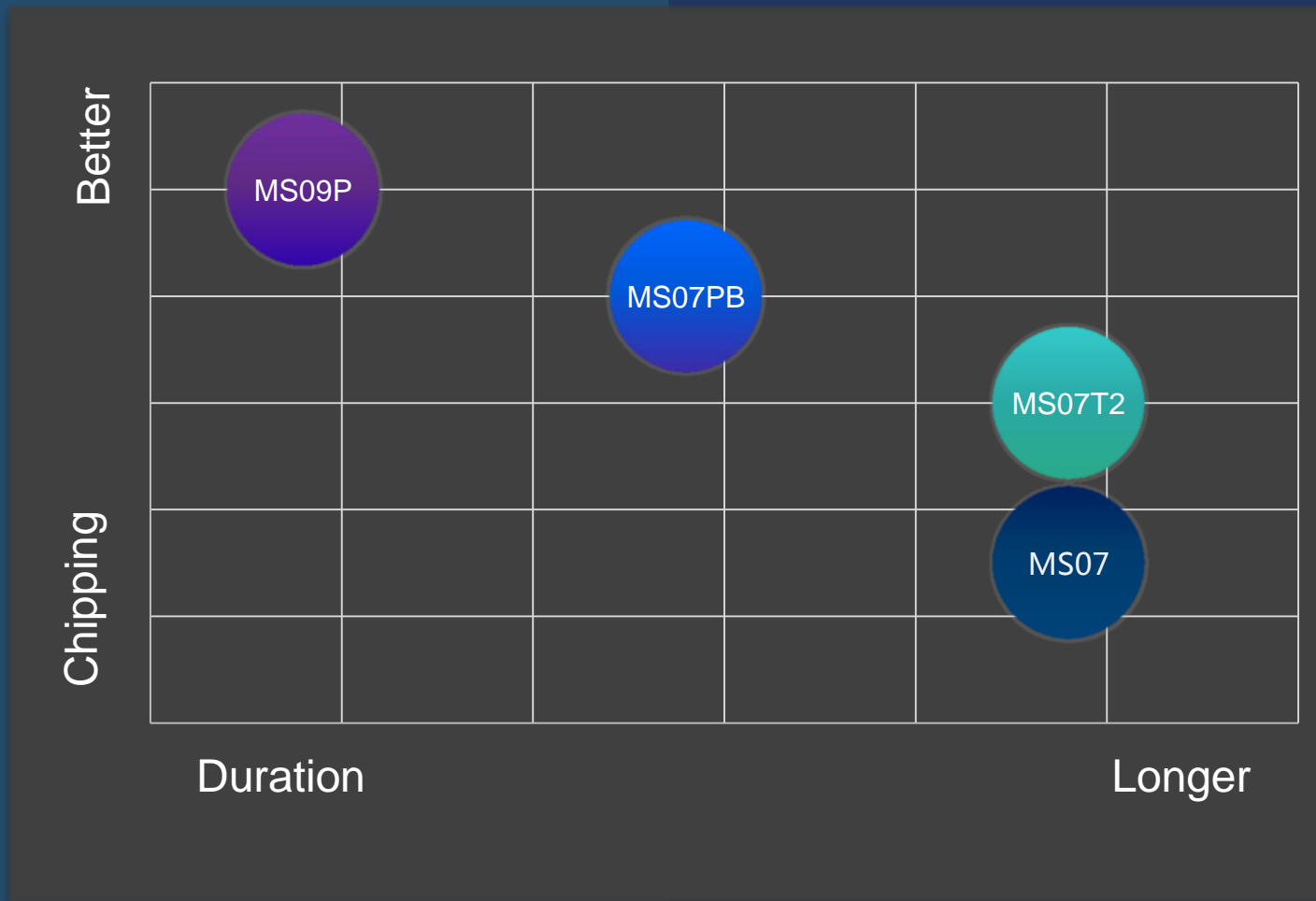
# GLASS & CERAMICS DICING BLADE

### Features:

Advanced metal blade series for glass cutting, Excellent backside chipping enabled higher-speed cutting.

- High accuracy
- Strong hold of grits
- Good wear resistance
- Good shape keeping ability

## Bond Comparison







## EXPERIMENTAL DATA

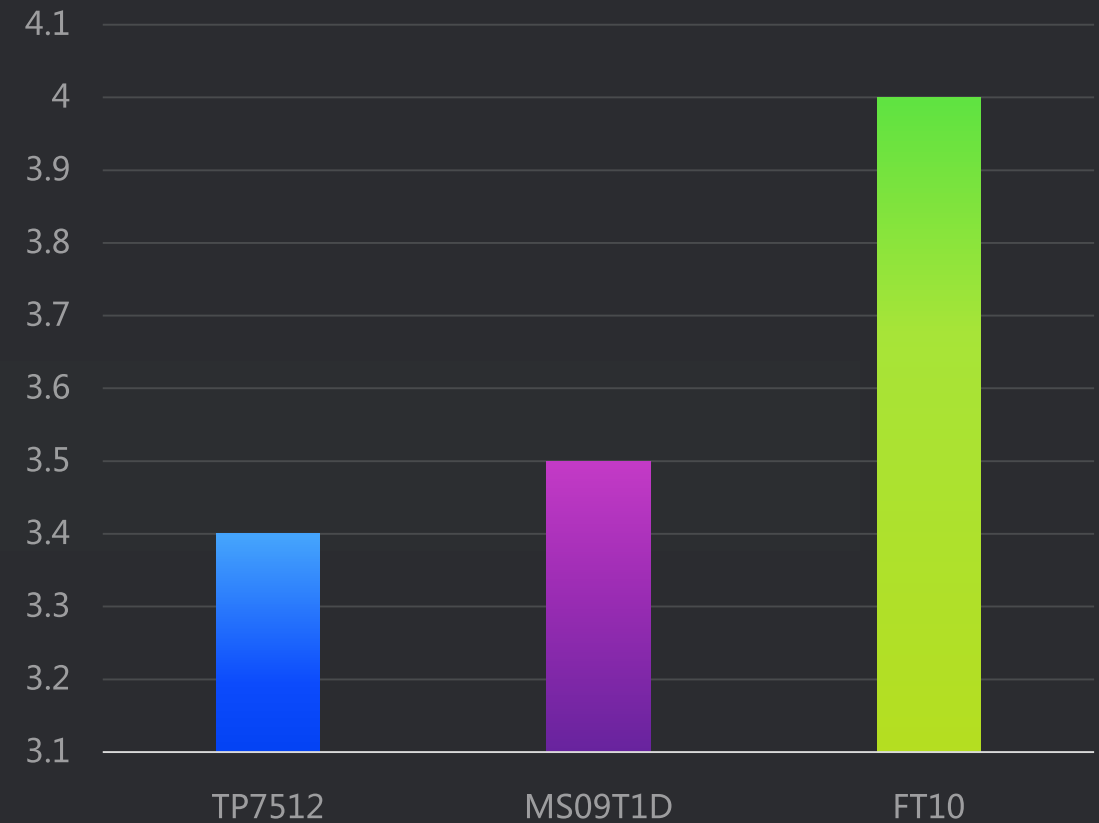
### CSP DICING BLADE

#### Back Side Chipping



Work piece : glass 0.6mm  
Blade : FT10 MS09T1D TP7512  
Spindle Speed : 30K RPM  
Feed Speed : 5 mm/s  
Size : 52X0.048X40 mm

#### Blade Life

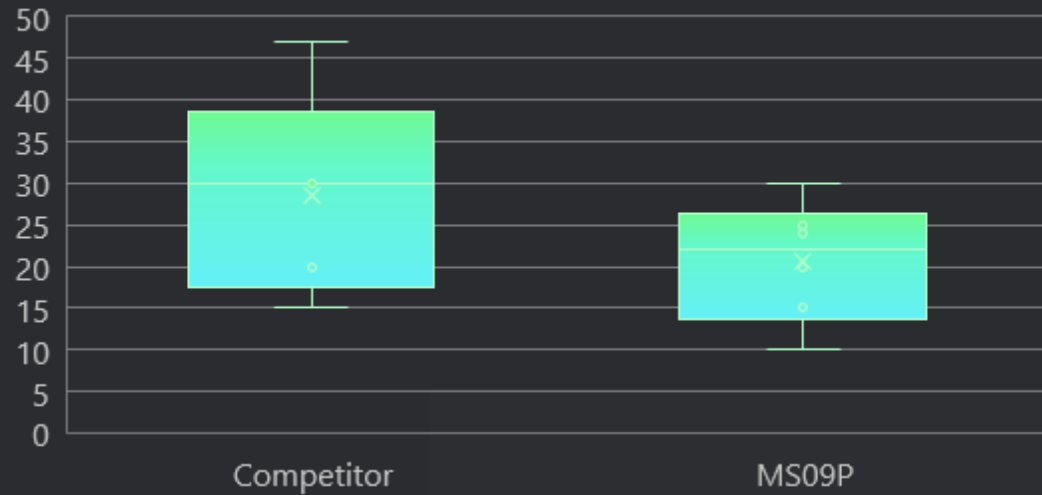




## EXPERIMENTAL DATA

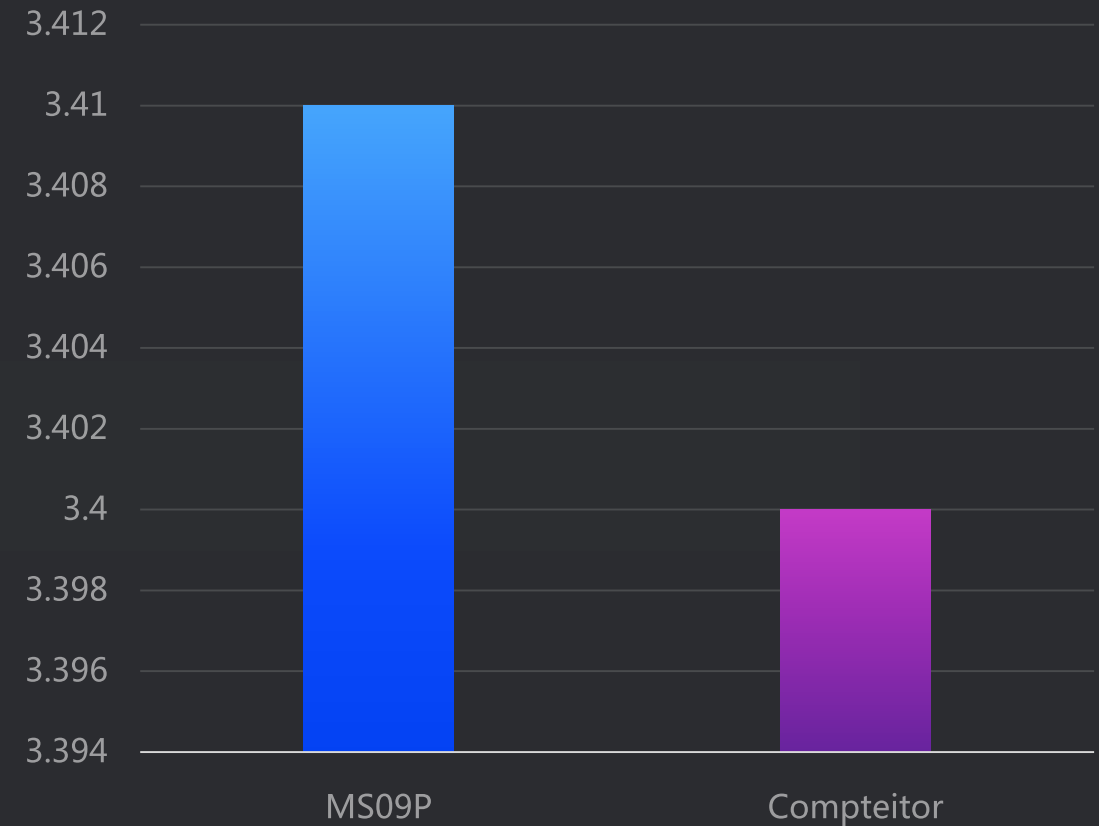
### GLASS DICING BLADE

#### Back Side Chipping



Work piece : Sapphire glass  
0.175mm  
Blade : MS09P  
Spindle Speed : 20K RPM  
Feed Speed : 3 mm/s  
Size : 53X0.1X40 mm

#### Blade Life



METAL BOND BLADE

# EXPERIMENTAL DATA

## BGA DICING BLADE

### Customer' s Specification:

Dimension Tolerance =  $\pm 100\text{ }\mu\text{m}$

Misalignment  $\leq 150\text{ }\mu\text{m}$

Blade Life > 10000m

### Dicing Parameters:

Spindle Speed : 35K RPM

Feeding Speed : 120 mm/s

Material Thickness : 0.7-1.3 mm

Cutting Depth : 0.5 mm into jig

Water Flow : 1.6 LPM

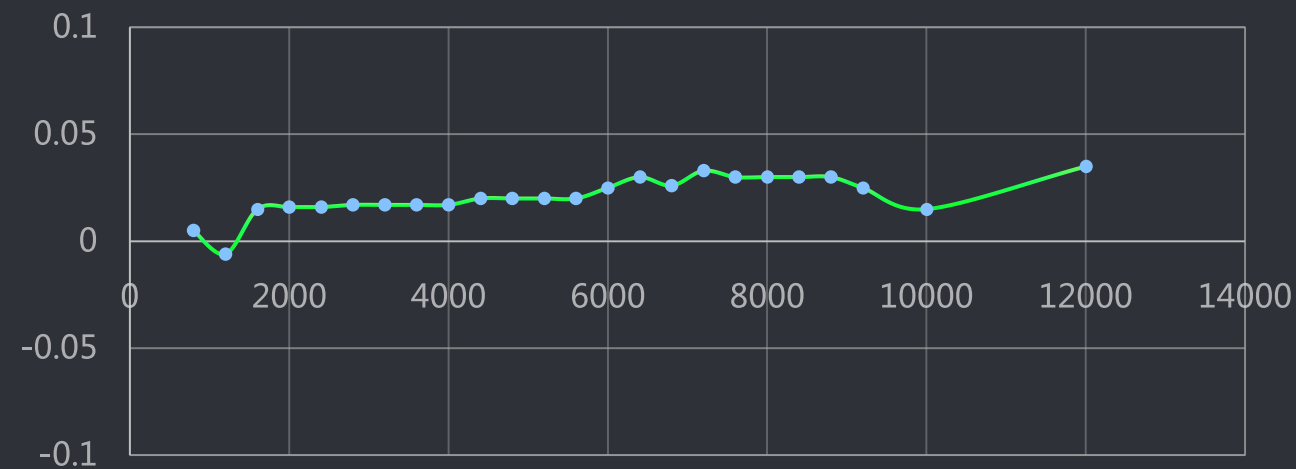
Blade :

SD280N75MS09T

### Results

Items	MS09T	Competitor
Life	15KM	Max.12KM
PKG size change	< 40 $\mu\text{m}$	< 40 $\mu\text{m}$

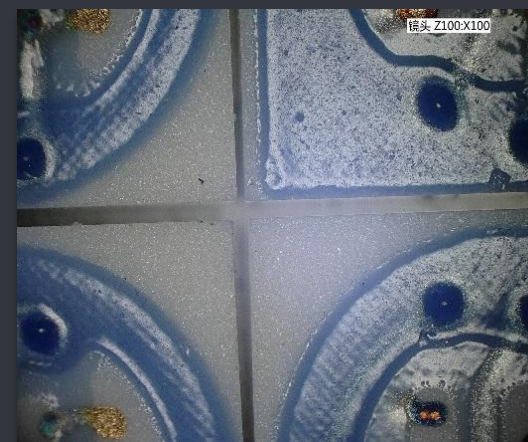
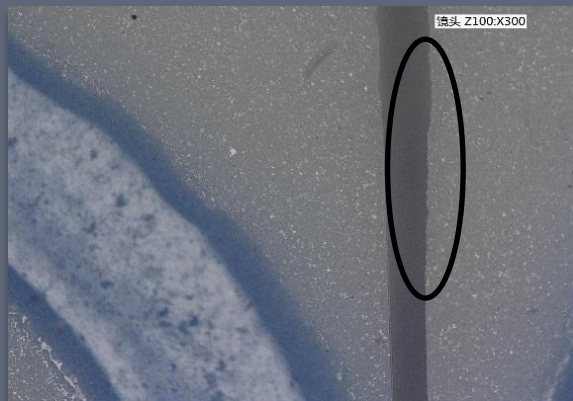
### Package Dimension



# EXPERIMENTAL DATA

## CERAMICS DICING BLADE

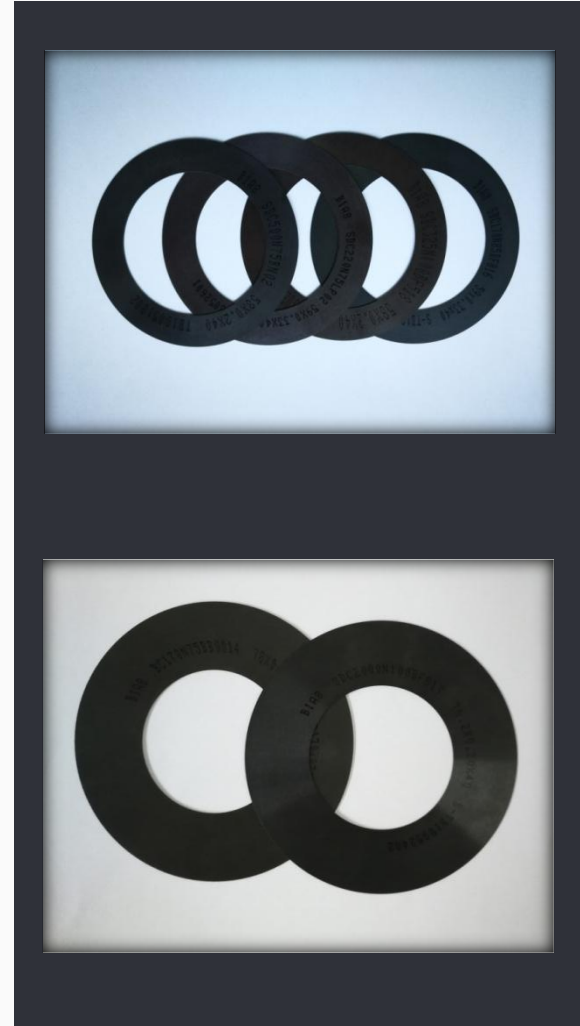
Work Piece : Sapphire glass  
0.175mm  
Blade : MS07  
Spindle Speed : 30K RPM  
Feed Speed : 5 mm/s  
Size : 58X0.125X40  
mm



# RESIN-BOND DICING BLADE







## General Introduction:

Resin bond blade is a kind of dicing blade formed by hot pressing with resin powder as binder and diamond or cubic boron nitride as abrasive. It has high self-sharpness and efficiency.



- The integration of production and R&D ensures product quality and reliability;
- A wide variety of binders was widely used in dicing field of QFN, ceramic and glass cutting materials.
- The combination of different abrasive concentration and particle size of blades fully meets the life and quality requirements.

# Specification:

B1A8	SDC	240	N	75	BF816	58	0.3	40
Basic shape	Abrasive Type	Grit Size	Hardness	Concentration	Bond	O.D.	Thickness	I.D.
1A8  1E8  1M8  1N8  1V8 	SD : Synthetic Diamond SDC : Coated Synthetic Diamond BC : Coated CBN	320 #320 360 #360 400 #400 500 #500 600 #600 800 #800 1000 #1000 1200 #1200 1500 #1500 1700 #1700 2000 #2000	H : High L : Low N: Medium	125 High 100 75 50 25 Low 	BF816 LP04 BN02 BR100 BB0014	Tolerance : 0/0.01	Tolerance : ±0.01	Tolerance : +0.01/+0.03

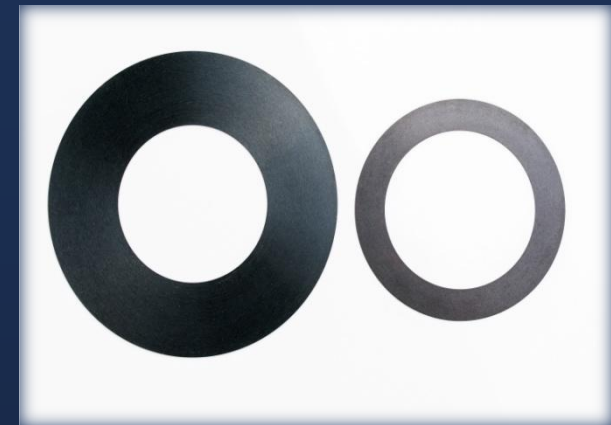
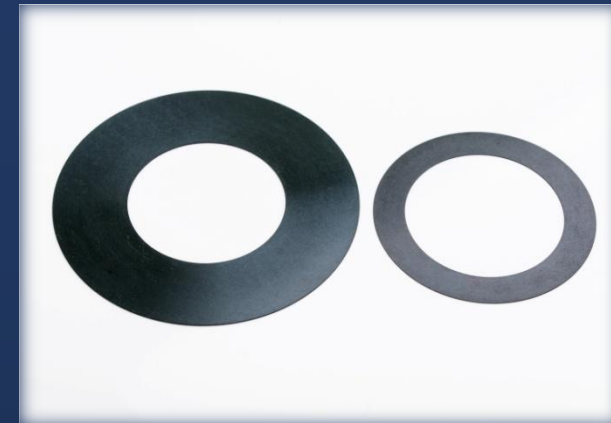
RESIN-BOND DICING  
BLADE

# QFN DICING BLADE

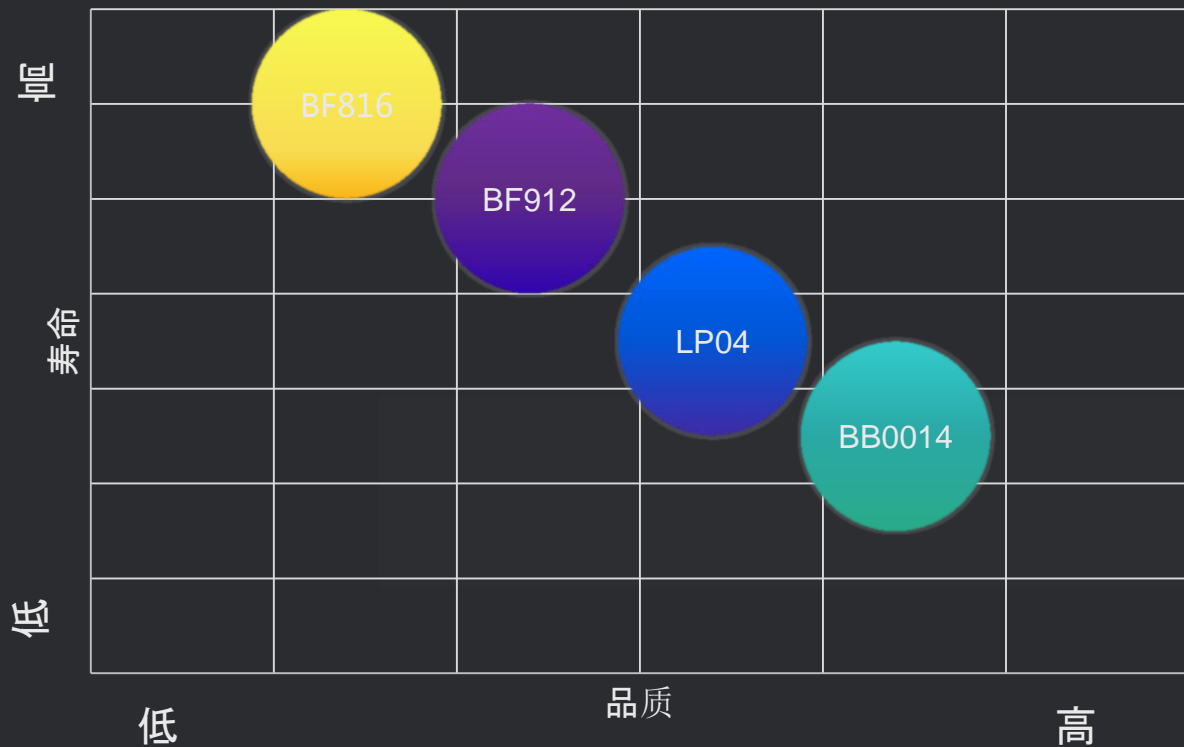
## Introduction:

Resin bond blade is widely used in the high quality dicing of ductility and stickiness materials, and can effectively solve the problems of smear, burr and back side chipping.

- The company is experienced in providing professional solutions for QFN packaging and segmentation.
- With high processing efficiency, the speed is up to 180mm/s.
- Different kinds of blades can be customized according to processing materials.



# RESIN-BOND BLADE FOR QFN DICING



## Characteristics And Applications

结合剂种类	特性	适用
BB0014	高品质	QFN
LP04	品质好	QFN
BF912	寿命长	QFN
BF816	寿命长	QFN/DFN



RESIN-BOND DICING  
BLADE

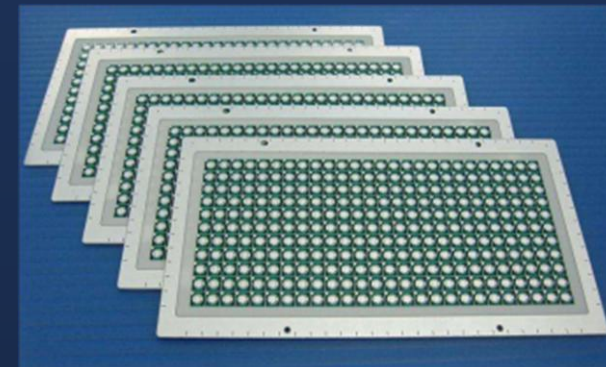
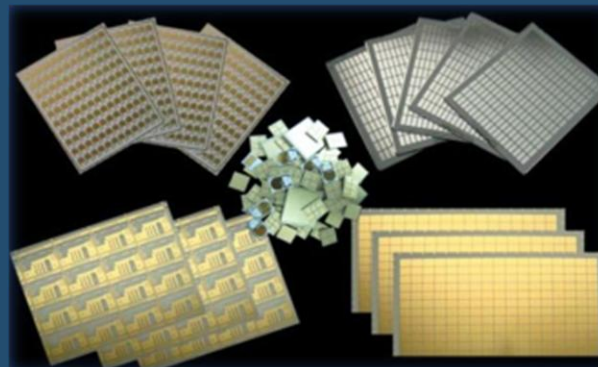
# CERAMIC DICING BLADE

## Introduction:

The precision of processing glass, ceramic and other crisp and hard material can be realized. With excellent dicing performance, the blades are applicable to the precision processing of difficult-to-process materials.

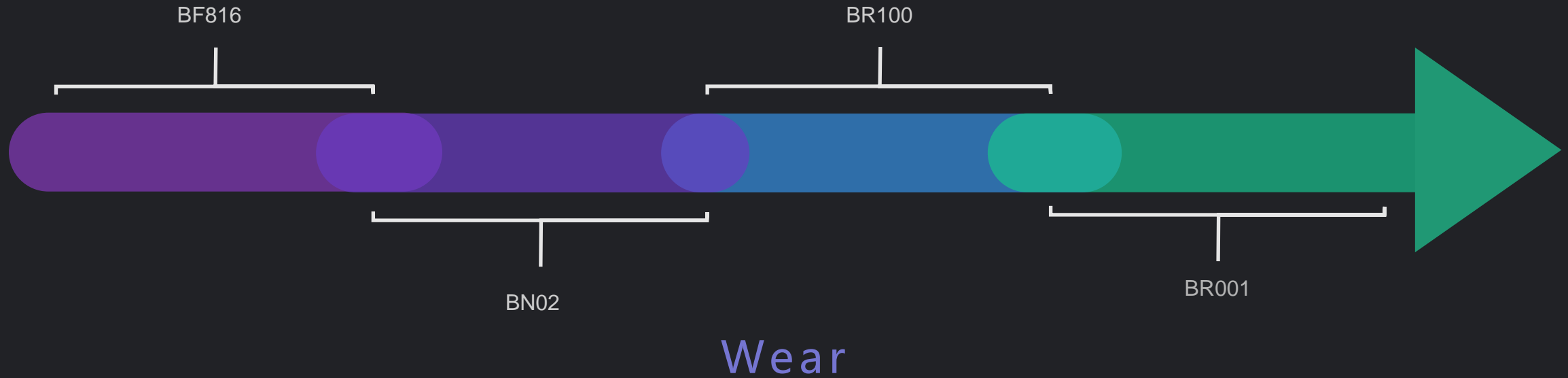
- Supported by invention patents ;
- High precision processing;
- Solving problems of chipping and inclined dicing.
- Solving the problems of adhesive layer blackening on ceramic surface.

Resin bond blades' applications on crisp and hard materials field.



# CERAMIC DICING BLADE

## Comparison Of Different Bond Blades



The wear data in the above table is derived from the actual dicing of the dressing boards. The processing results may be different from the above data because of different dicing materials and processing parameters.

# CERAMIC DICING

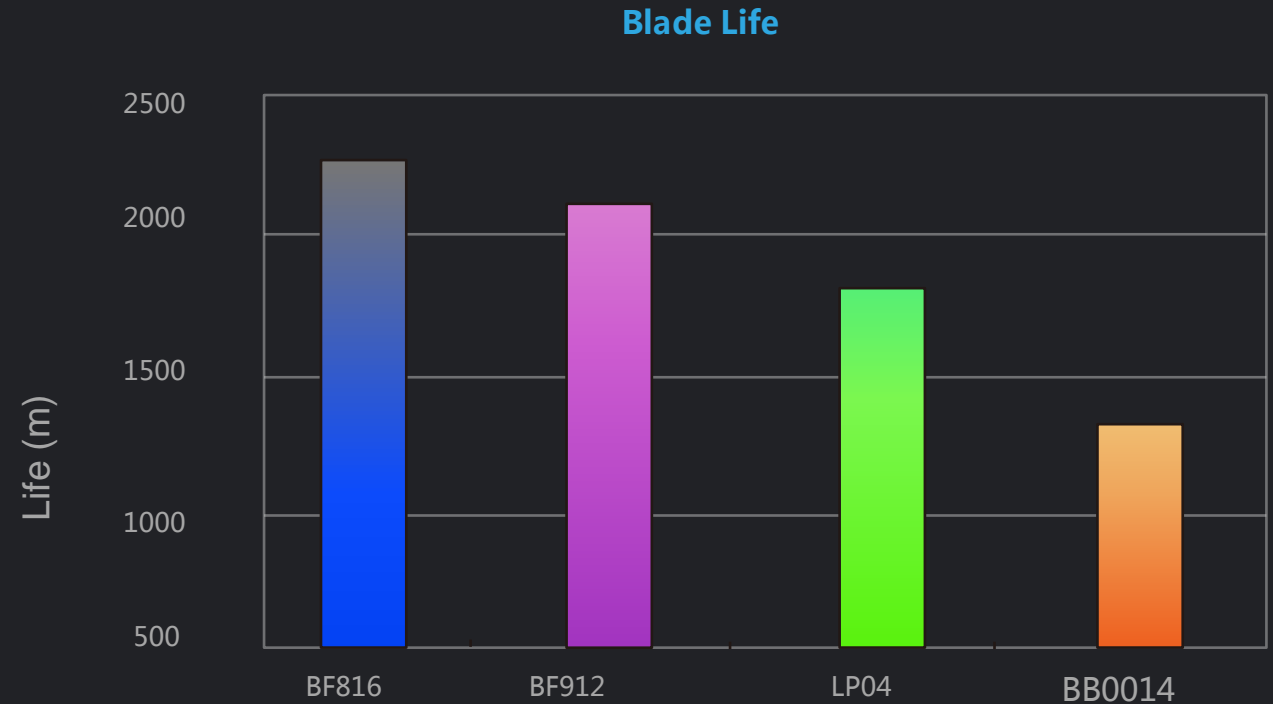
Characteristics And Applications Of Various Bonds

Bond Type	Characteristics	Main Applications
BF816	Long life	Al2O3 AlN
BN02	Standard life	Al2O3 AlN
BR100	Good quality	Quartz,Glass
BR001	Excellent quality	Glass, crystal, etc.

# APPLICATION EXAMPLES

## Experimental Result Of Resin-bond Blade For QFN Dicing

Processing Material : QFN 5.0X5.0X0.8mmt  
Spindle Speed: 25K RPM  
Feeding Speed : 60mm/s  
Specification: 58X0.3X40  
Grit Size : 320#  
Concentration: 75%

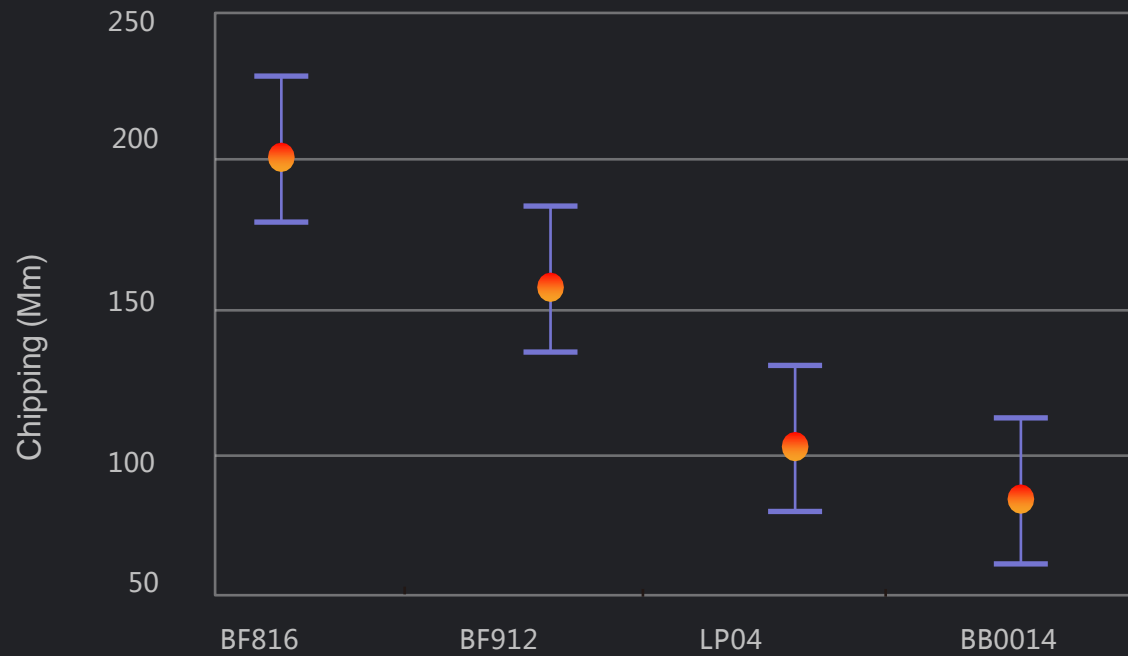


**RESIN-BOND DICING  
BLADE**

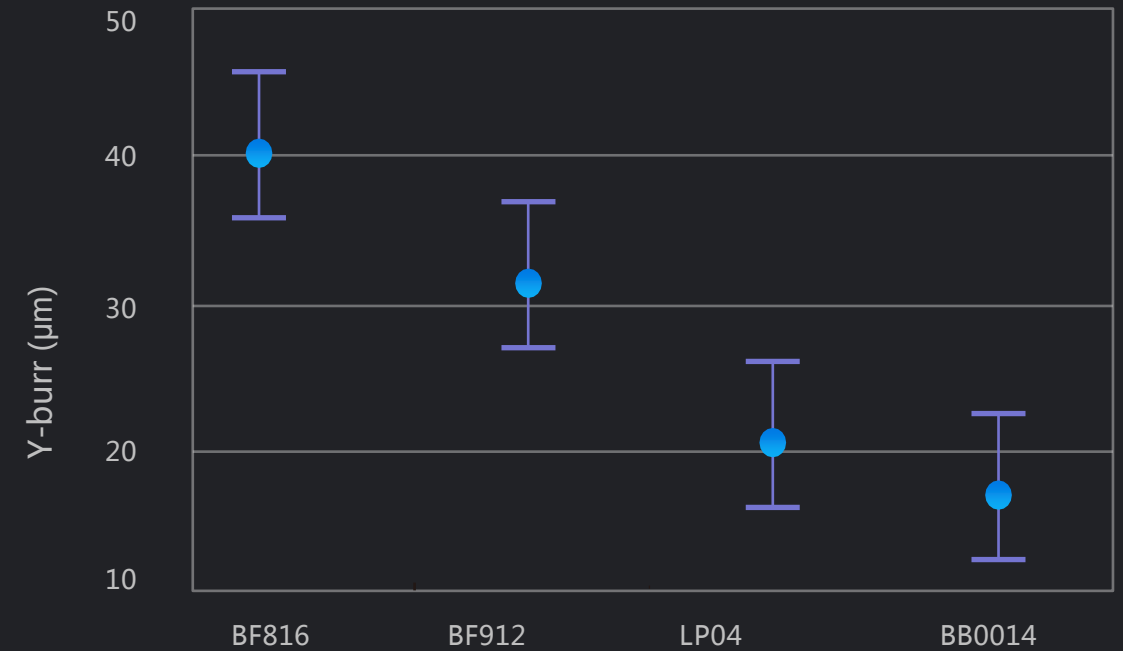
# APPLICATION EXAMPLES

Experimental Result Of Resin-bond Blade For QFN Dicing

Back Side Chipping



Y-burr



RESIN-BOND DICING  
BLADE

## RESIN-BOND DICING BLADE

# EXPERIMENT 2

### Result:

Dicing material: aluminum oxide ceramic;  
Experimental blade types: SAIL LP04 and  
one blade type of competitor

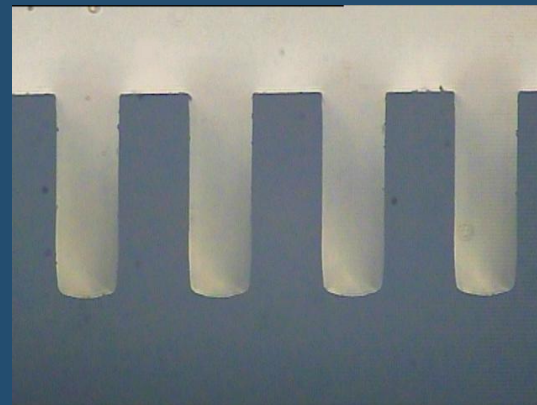
The closer the three curves are, the better  
blade shapes are preserved.

After contrast of two curves, we can find  
that blade shape of LP04 is much better  
than competitor's blade.

LP04

Competitor's Blade

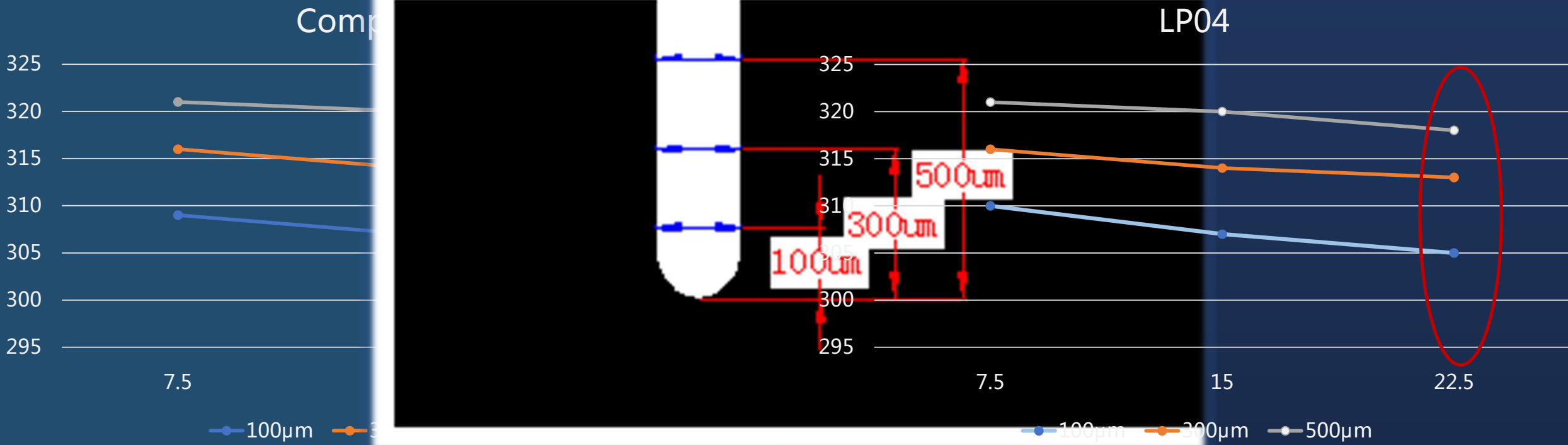
15.0 m



22.5 m



EXPERIMENT 2



## GRINDING WHEEL

# WAFER BACK & FRONT WHEEL

## SPECIFICATIONS

Type	O.D(mm)	Thickness(mm)	I.D(mm)	Grit Type	Grit Size	Bond	Con.
6A2T	175-335	20-45	76-235	Diamond	D54-D4.6	B,V	100

This type of wheel is mainly used for grinding in photovoltaic semiconductor industry. With high efficiency and cost effective, it performs well on Japan and Germany grinding machines.

Main features:

- Good wear resistance, long working life
- High efficiency on stock removal
- Less damage and high finish of workpiece surface

Suited machine:

DISCO,OKAMOTO,TSK,STRASBARGH etc.



GRINDING WHEEL

APPLICATION:

Type	O.D(mm)	Bond	Grit
Silicon	Coarse grinding	B	SDC340,SD340-SD400
	Fine grinding	V	SD2000-SD6000
			60D,45D
Resin PKG		B	SD320-SD2000
		V	SD1500-SD4800

GRINDING WHEEL

LED SUBSTRATE GRINDING  
WHEELS SPECIFICATIONS

6A2B 254X38X155X5X10 D400M03 100									
Types	O.D	Thickness	I.D	Width	X	Grit Type	Grit Size	Bond	Con.
6A2B	254	38	155	5	10	Dia	400	M03	100

The grinding wheels for LED substrate are mainly used for back thinning of sapphire epitaxial wafer, silicon wafer, gallium arsenide and GaN wafer.

Suited machine : SHUWA SGM-6301, NTS Nanosurface-180G, NTS Nano surface 250/NC-VDM, BSG-V  
( 305MM CHUCK )

GRINDING WHEEL

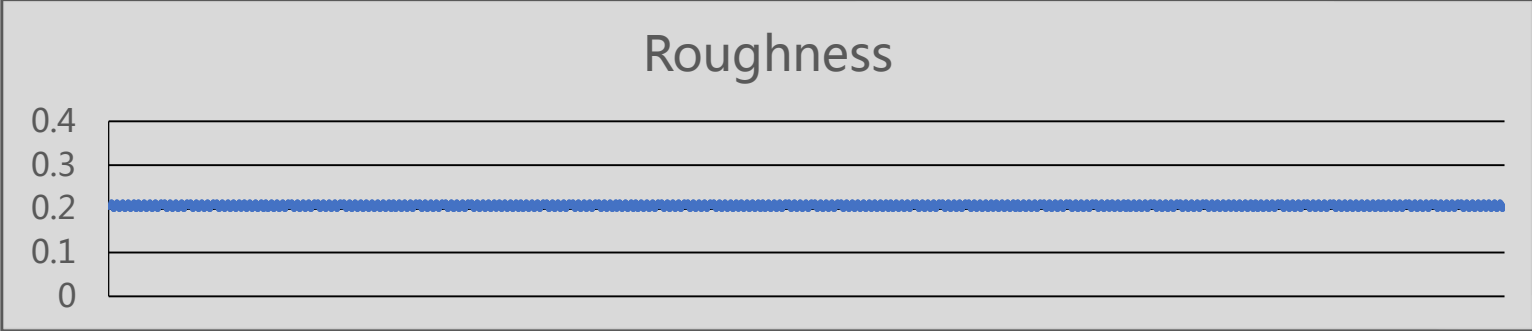
LED SUBSTRATE GRINDING  
WHEELS

TEST PARAMETERS

Wheel Type : SD320 D304*H155*T12*W4			
First STEP		Second STEP	
Wheel RPM	1000	Wheel RPM	1000
Wafer RPM	100	Wafer RPM	100
Z feed speed	0.04mm	Z feed speed	0.024mm
Wafer Number	4 PCS ( 4 inch wafer )	Wafer Number	4 PCS ( 4 inch wafer )

RESULT

TTV	Roughness	Work Life
≤0.2 %	0.294-0.325	3200 PCS wafer

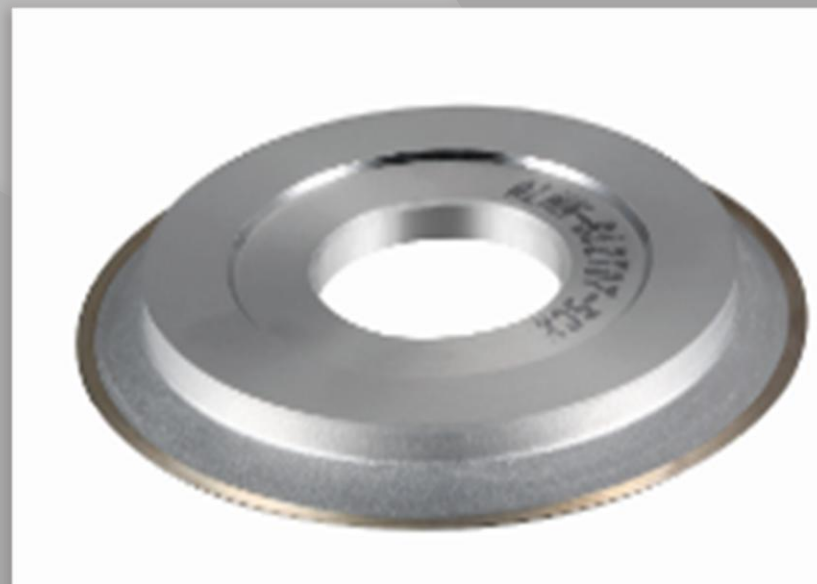


## SAIL HUB BLADE SERIES

Hub blade has strong dicing holding capacity and self-sharpening.

Hub blade has strong dicing performance , and can be applied on high quality processing on silicon wafer.

<b>Processing Materials</b>	Silicon wafer, chemical compound semiconductor wafer (GaAs 、 GaP, etc.) , oxide semiconductor (LiTaO3 etc.), other materials
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HUB BLADES

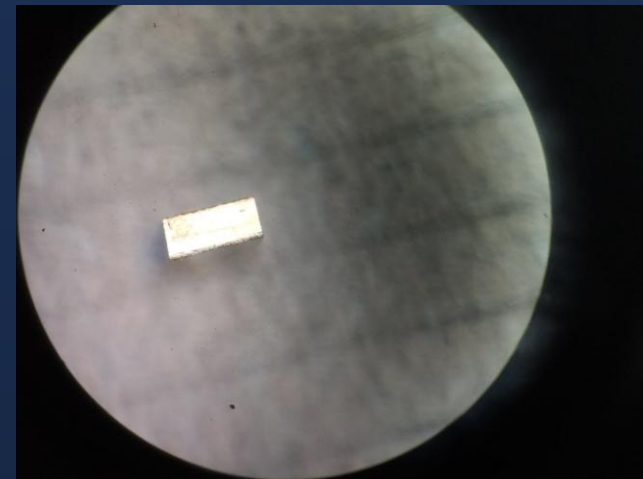
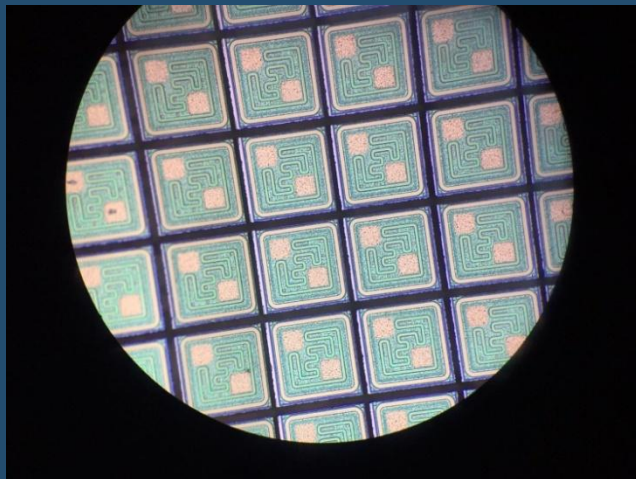
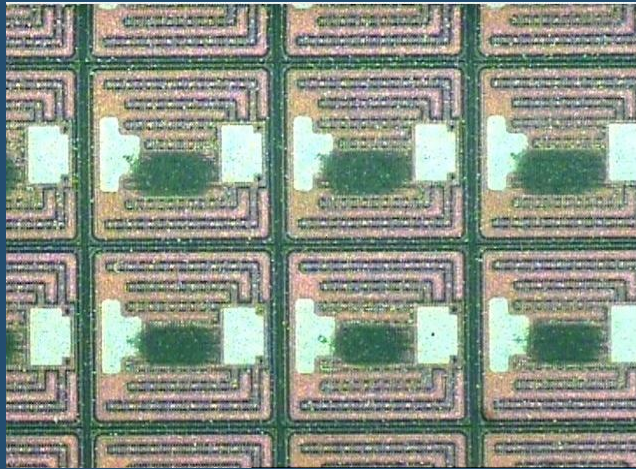
SAIL HUB BLADE SERIES

Specification:

A	SD	3000	CC	3H	21	52
Basic Shape	Grit Type	Grit Size	Concentration	Hardness	Kerf	Exp
	SD : Synthetic Diamond	5000 5000#	AC	3H	16 16-20	39 390-510
	SDC : Coated Synthetic Diamond	4000 4000#	BC	4H	21 21-25	52 510-640
	BC : Coated CBN	3500 3500#	CC	5H	26 26-30	65 640-760
		3000 3000#	DC	6H	31 31-35	76 760-890
		2000 2000#			36 36-40	89 890-1040

HUB BLADES

# Wafer Cutting



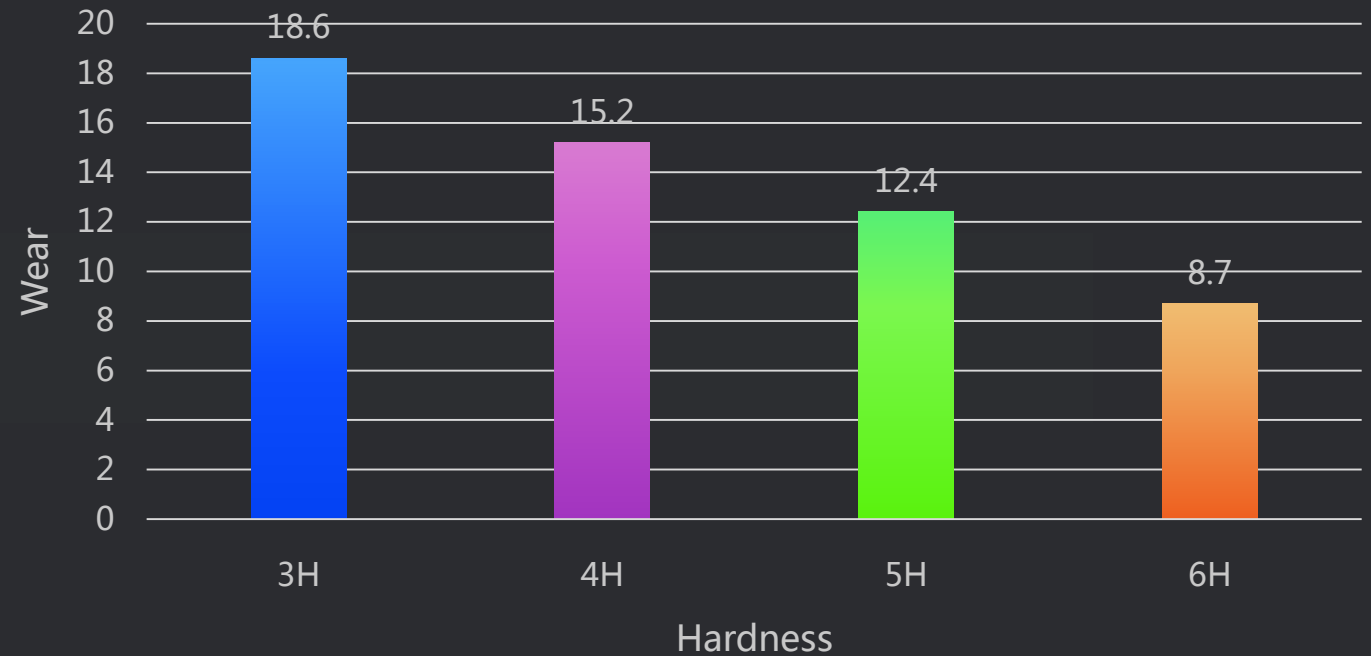


# HUB BLADES

SAIL HUB SERIES

Work piece : Si 0.3mm  
Blade :A-SD3000-CC-2152  
Spindle revolution : 30K RPM  
Feed Speed : 60 mm/s

Relationship between hardness and wear of blade



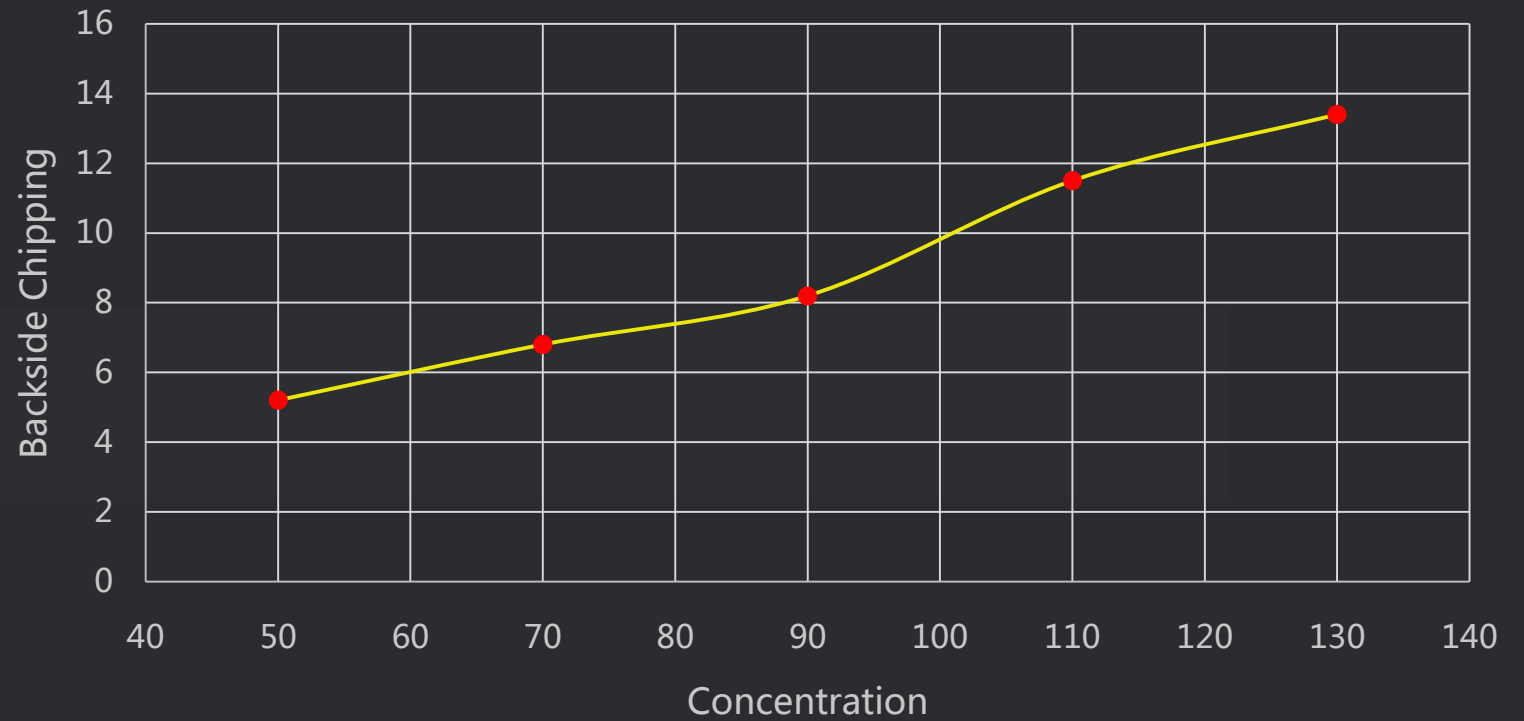


# HUB BLADES

SAIL HUB SERIES

Work piece : Si 0.3mm  
Blade :A-SD3000-CC-2152  
Spindle revolution : 30K RPM  
Feed Speed : 60 mm/s

Relationship Between Diamond Concentration And Backside Chipping





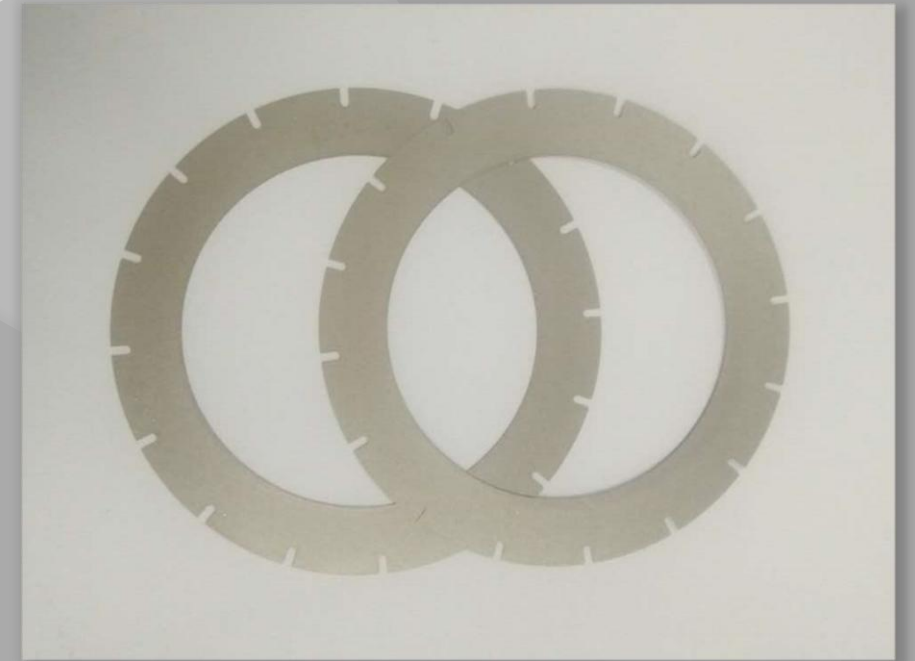
## HUBLESS BLADES

# SAIL HUBLESS BLADE SERIES

Nickel bond hubless blade has excellent dicing performance , and can be applied on high quality processing on PCB.

### Cutting Materials

PCB, Various semiconductor packaging elements, raw ceramics and other materials.



HUBLESS BLADES

SAIL HUBLESS BLADE SERIES

Specification:

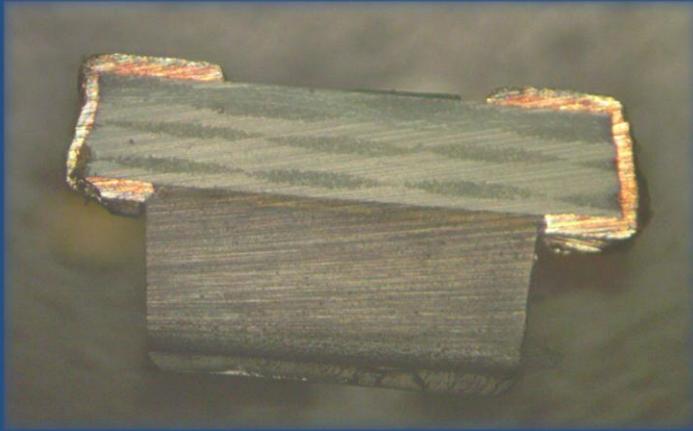
B	SD	15	CC	3H	56	0.1	40
Basic Shape	Grit Type	Grit Size	Concentration	Hardness	O.D.	Thicknes s	I.D.
	SD : Synthetic Diamond SDC : Coated Synthetic Diamond BC : Coated CBN	12 1200# 15 1000# 17 800# 20 700# 25 600# 30 500# 35 400#	AC BC CC DC	3H 4H 5H 6H	Standard Accuracy : 0/0.05	Standard Accuracy : -0.005 /+0.005	Standard Accuracy: +0.01/+0.03

HUBLESS BLADES

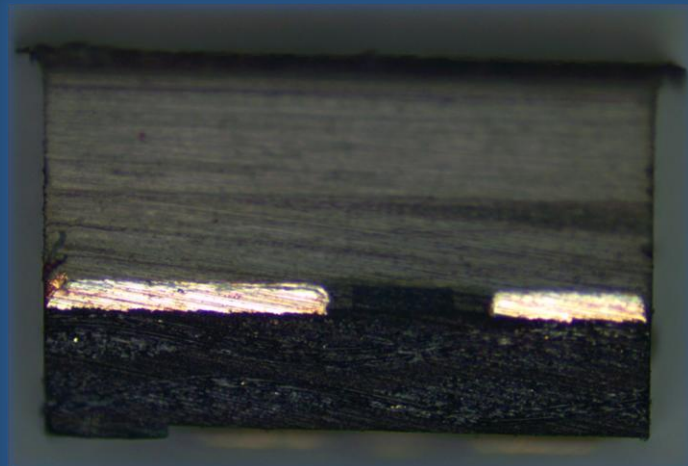
# SAIL HUBLESS BLADE SERIES

Sample of Working Materials :

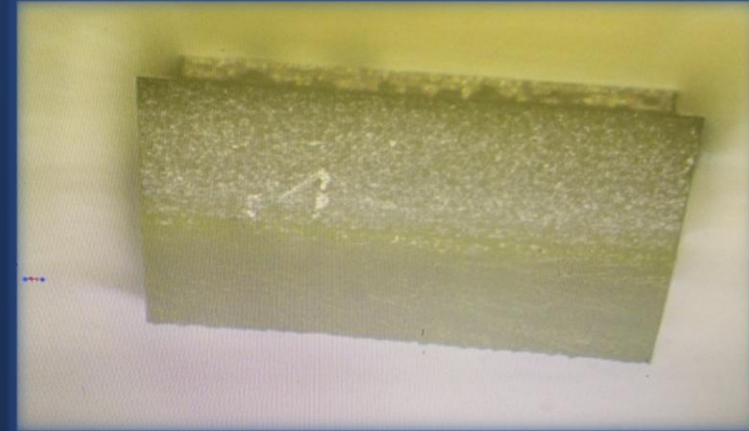
PCB



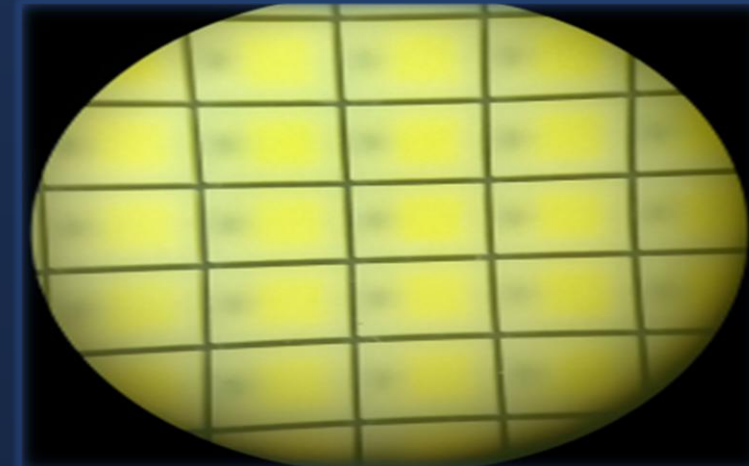
No Burr



Ceramic



No Chipping





# HUBLESS BLADES

SAIL HUBLESS BLADE SERIES

## Practical Application Of Blades With Different Abrasive Particle Grit

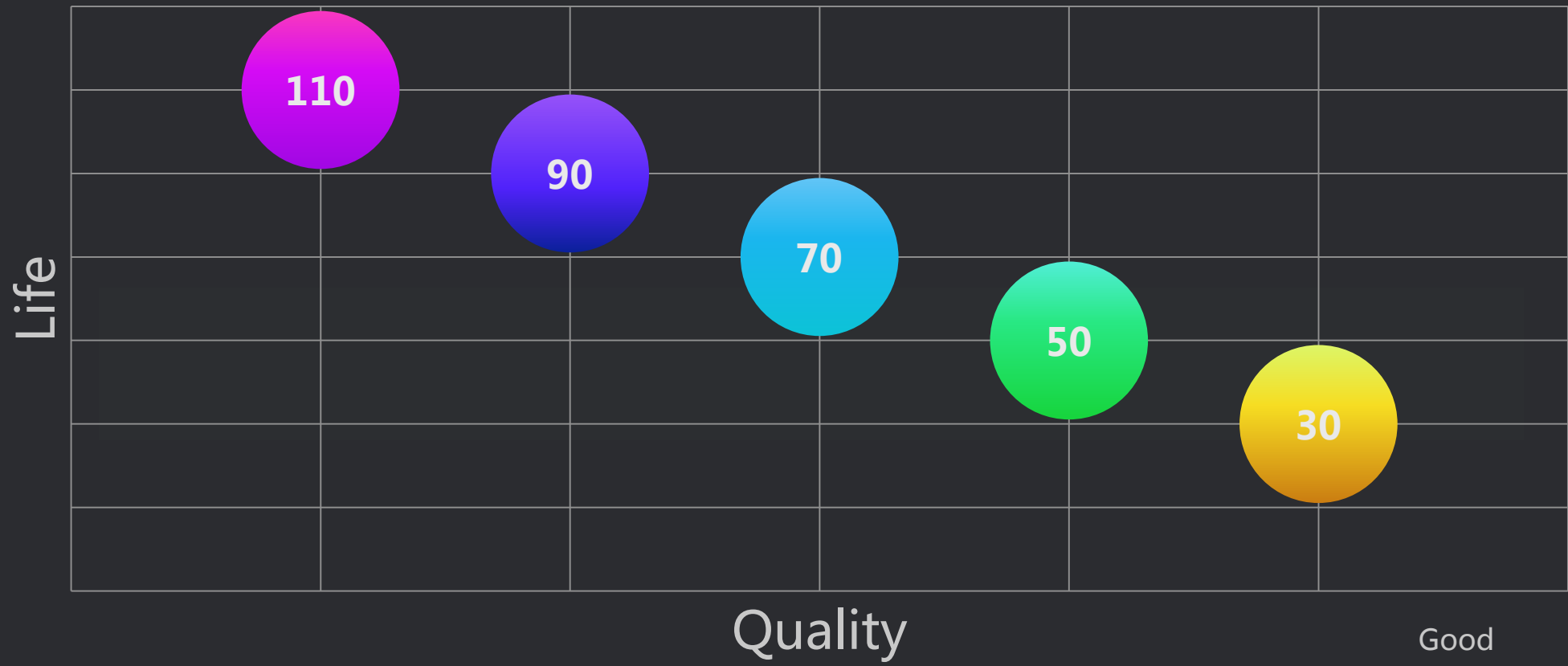
Grit						
3000#	2000#	1000#	800#	600#	500#	400#
Si			Thermistor, ceramic substrate			
		Ferrite, PCB			Ceramic, BGA, QFN	



# HUBLESS BLADES

SAIL HUBLESS BLADE SERIES

Relationship Between Quality And Life Of Blade Concentration





# Q&A

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# Thank You

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