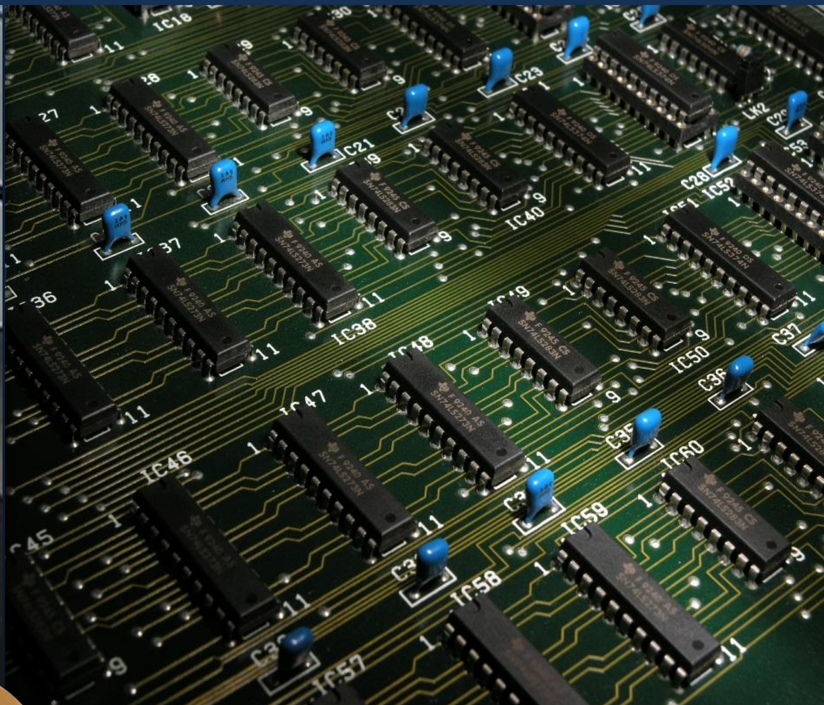
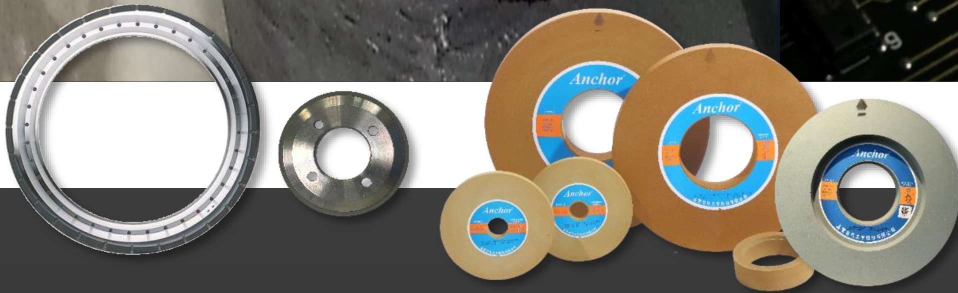
GRINDING WHEEL for
Semiconductor industry and Passive components





Anchor®

Wafer grinding wheel

Anchor provides Metal, Ceramic and Resin bond specifications to satisfy various materials of wafer grinding. The product is matched with the specifications and dimensions of the major brands of machines.

Wheel specifications

Abrasive	Grit size	Hardness	Concentration	Bond	Shape
SD SDC	#320 ~ #15000	N	50 75 100 125	B V M	2A2S 2A7S

Regular specification and size of wafer grinding wheel

(Z1- rough grinding)

- Excellent cutting ability
- Reduce wafer damage from grinding process
- Stable grinding during the high-load processes

Z1 (rough grinding)

Grit size	Item	Wheel size / mm	Machine
#320 #600 #1000 #1500 #2000 #6000	8" 10" 12"	203(D) x 4(W) x 5/7(X) 250(D) x 4(W) x 5/7(X) 300(D) x 4(W) x 5/7(X) 303(D) x 4(W) x 5/7(X)	DISCO Okamoto ACCRETECH

(Z2- Finish grinding)

- Reach a mirrored surface quality
- Stable finish grinding quality
- Reduce grinding force
- Reduce wafer surface damage from grinding process
- Avoid wafers warping from grinding process

Z2 (Finish grinding)

Grit size	Item	Wheel size / mm	Machine
#8000	8" 10" 12"	203(D) x 4(W) x 5/7(X) 250(D) x 4(W) x 5/7(X) 300(D) x 4(W) x 5/7(X) 303(D) x 4(W) x 5/7(X)	DISCO Okamoto ACCRETECH
#15000-S	8" 10" 12"	203(D) x 4(W) x 5/7(X) 250(D) x 4(W) x 5/7(X) 300(D) x 4(W) x 5/7(X) 303(D) x 4(W) x 5/7(X)	

Case of Si wafer grinding

Wheel size : 300D x 4W x 5X Work : 12 " Si wafer Machine : Disco DAG810

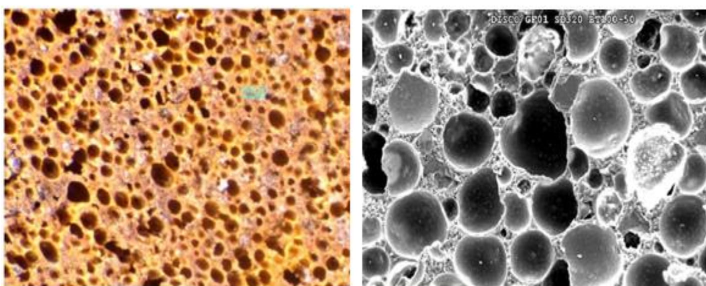
	Competitor	Anchor-1
Parameters	Wheel speed : 2400/240rpm Infeed : 3.0/2.5/1.0 um/s	Wheel speed : 2400/240rpm Infeed : 3.0/2.5/1.0 um/s
Current value	14.6	14.7
Ra	0.23	0.18
	0.21	0.18
	0.20	0.17
	0.23	0.18
Average of Ra	0.22	0.18

Wear ratio(Work piece / Grind wheel) = 200

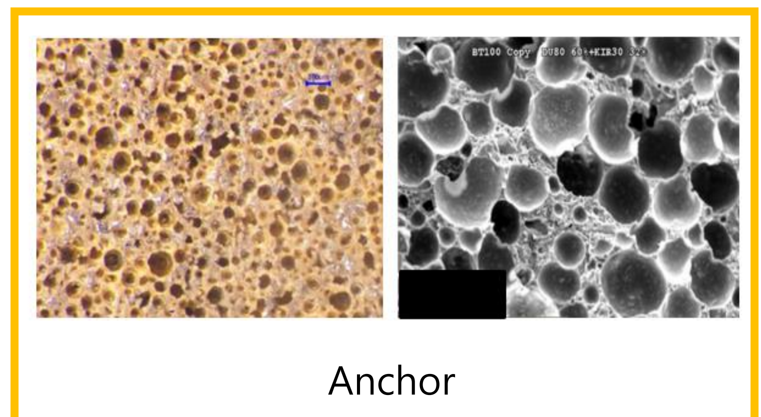
Grinding results: Under the same parameters, the Anchor load is similar to the original grinding wheel (14.7A), but the surface roughness Ra is significantly better than the original grinding wheel.

SEM comparison with original grinding wheel

The structure of grinding wheel shown under SEM is very similar to the original grinding wheel.



Competitor



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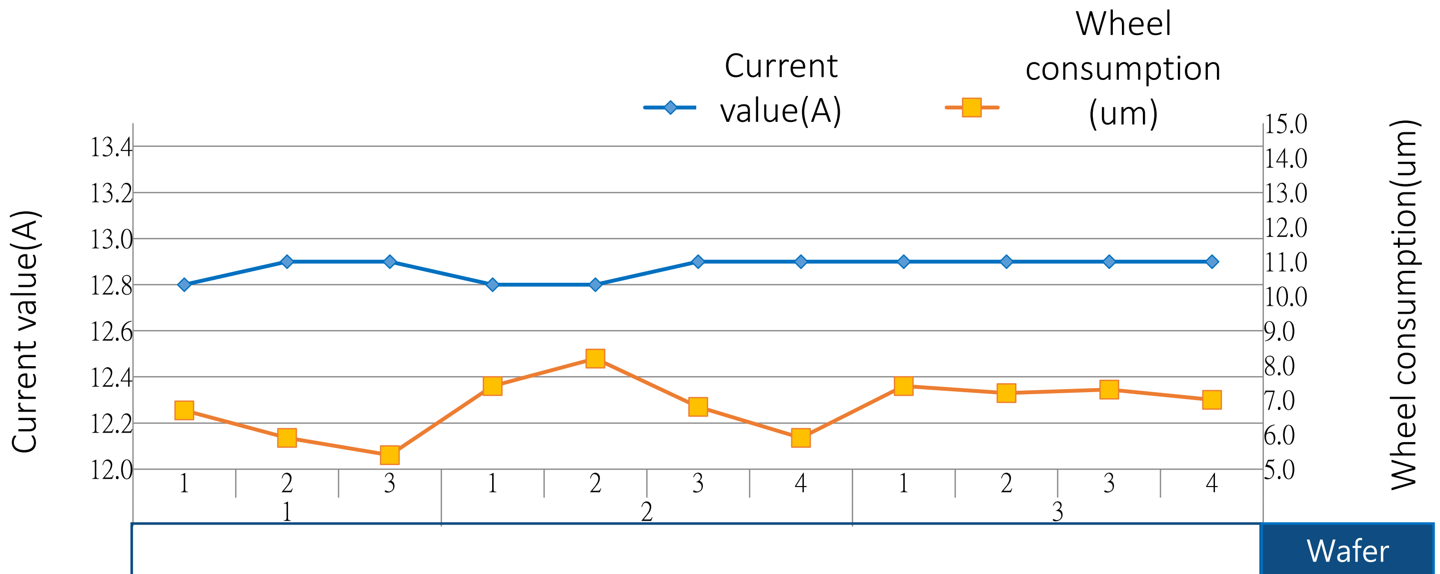
Case of AlN grinding

Wheel size: SD 300 x 4 x 8 Work : 4.5 " AlN Machine : Disco DAG810

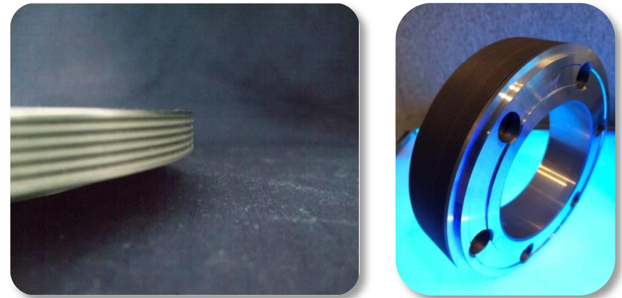


Parameters : Wheel speed 1500rpm, Work speed 100rpm, After the first dressing on the machine, there will be no more dressing during the process.

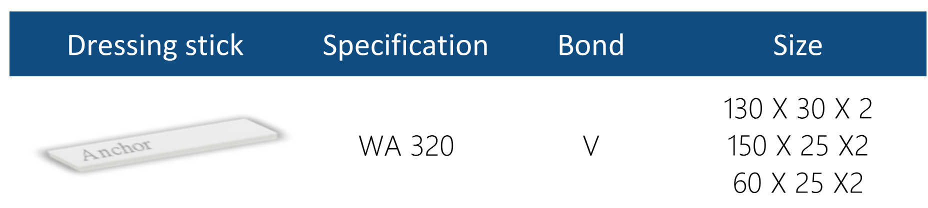
Result : The Anchor processing current value is stable between 12.8~12.9A (11A without load), the load is similar to the original grinding wheel (12~13A), and the grinding wheel consumption is 5.4~8.2um, slightly lower than the original grinding wheel (10um).

Beveling wheel and dressing sticks

After the wafer dicing process, the wafer edge might formed right angles, and due to the hard and brittle nature of the material, the damage may occur during subsequent mechanical processing and transportation. In order to avoid damage, a beveling wheel is used to process the edge of the wafer to make the wafer edge rounded and passivized, and reduce the product defect rate.



Dressing sticks for beveling wheels, used to dressing the wheel edge to increase cutting ability.

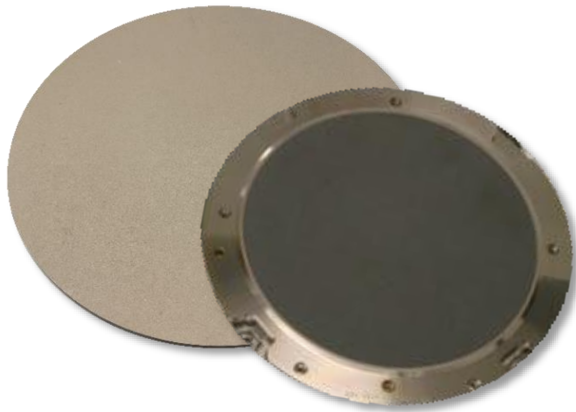


Dressing stick	Specification	Bond	Size
	WA 320	V	130 X 30 X 2 150 X 25 X2 60 X 25 X2

* size is customized.

Ceramic vacuum chuck

The work piece (including wafer, glass, PET film or other thin work piece, etc.) was placed on the ceramic vacuum chuck and be absorbed through the breathability of the chuck. Then the wafer could been ready for cleaning, cutting, grinding, screen printing and other processing processes.



- Wear-resistant, suit for various applications
- Adjustable porosity
- To avoid surface scratches

Abrasive	Grit size	Porosity%	Wheel Size	Application
Aluminum oxide Silicon carbide	#120 - #5000	35-50%	6″ 8″ 12″	Chuck for wafer grinding and dicing Porous vacuum chuck

*More specification could be customized.

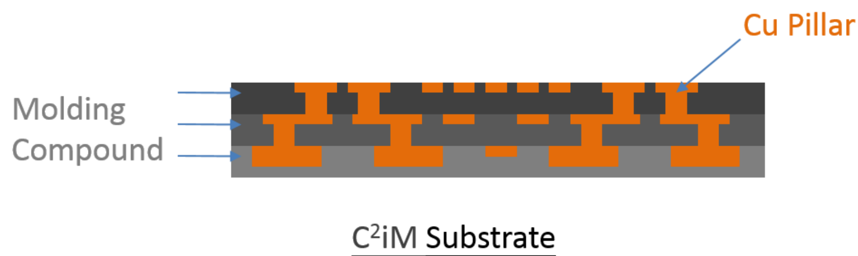
Dressing plate

Abrasive	Grit size	Wheel Size	Application
Aluminum oxide Silicon carbide	#120 - #5000	155 X 2	For wafer backside grinding wheel dressing

*More specification could be customized.

Heterogeneous surface polishing

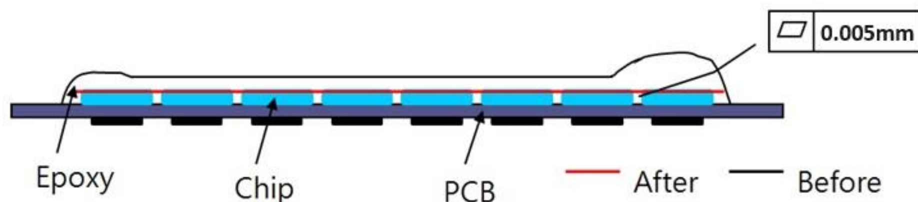
IC board could be divided into ABF, BT and MIS by the materials and process. Part of the process is based on epoxy resin as the main sealing film material, and with the copper wires which are electroplated to build on each molding layer (the figure shown as below). Therefore, the grinding wheel will simultaneously grind both epoxy resin and copper wires in the grinding process.

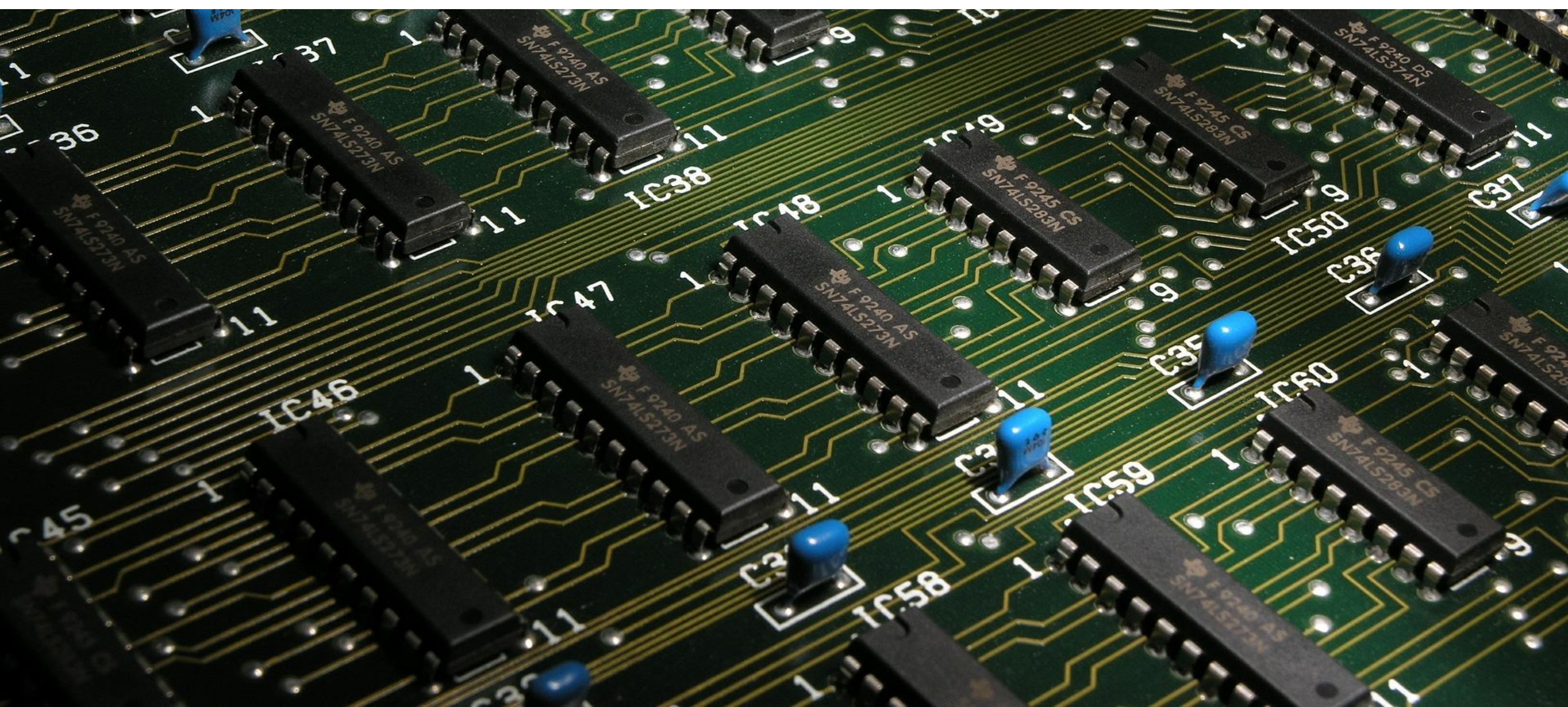


C²iM Substrate

In addition to the grinding process of the above-mentioned substrate manufacturing. Anchor also provides the best solutions for the application grinding process of EMC packaging (Epoxy Molding Compounds), PLP panel level packaging and FOPLP, which are extended by related technologies.

Current processing experience includes : Pure cooper, Cooper + EMC, ABF + cooper, BT + cooper, EMC + Chip, Invar and so on.





Case of HSP grinding

IC board grinding

Specification	HSP
Method	Horizontal spindle surface grinder
Application	IC board with higher cooper content (Cu>50%)
Material	Cooper + EMC
Result	Lower loading, improved yield, good roughness, Ra < 0.3um

Specification HSP Wheel size(mm) 355x75x127 Wheel speed 30-32 m/s
Feed rate 30 m/min Depth setting (rough) 7um (middle) 4um (finish) 2um

Wheel specification of HSP

Grit size		Wheel size	Machine
#320 #600 #800 #1000	#1200 #1500 #2000 #3000	6”- 20” Peripheral grinding	Horizontal spindle surface grinder
		6”- 20” Backside grinding	Vertical spindle backside grinder

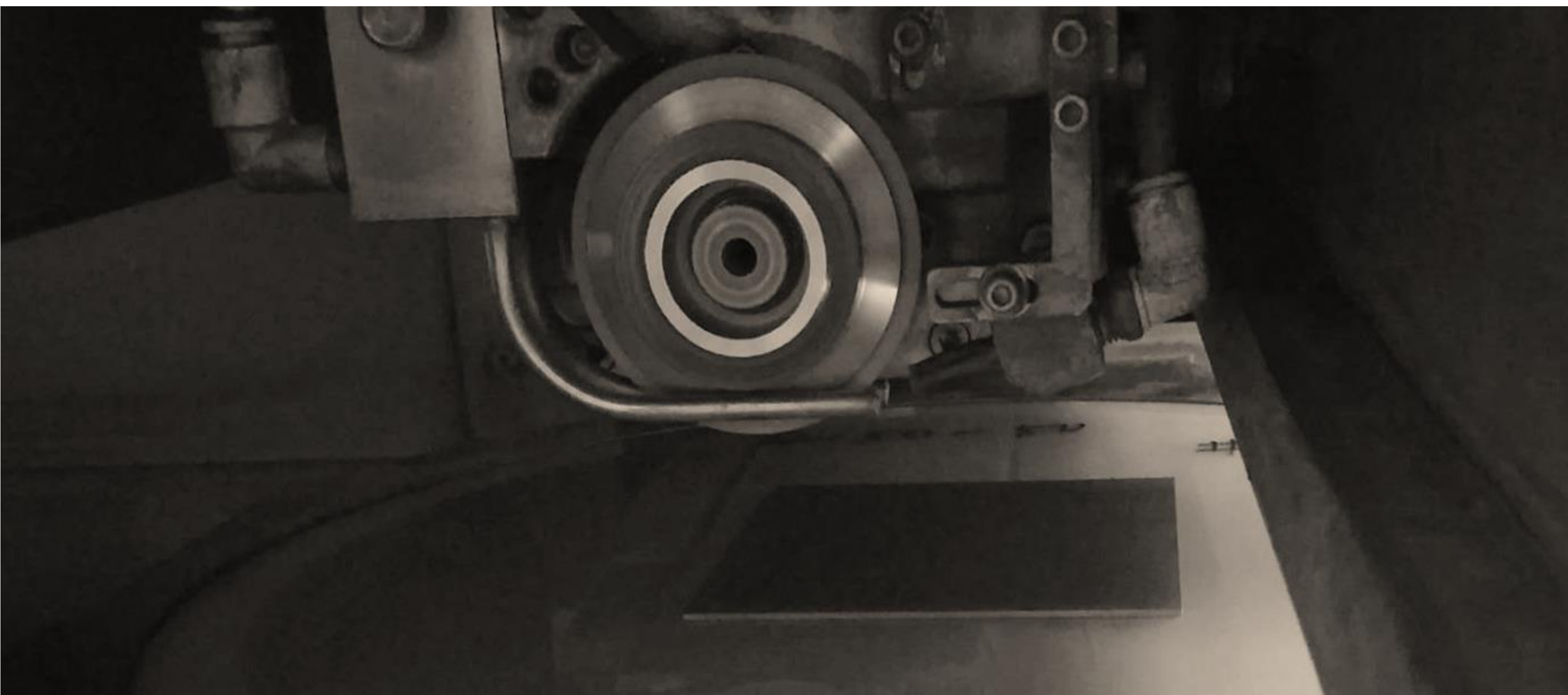
- Wheel size could be customized by the machine type.

Dicing blade

Used in high-tech electronic parts and related products such as magnetic head, IC, LSI, optical fiber, semiconductor, electronic lead frame and so on.

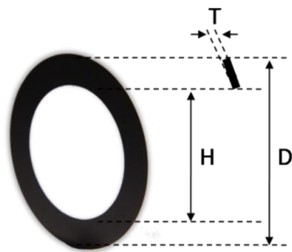
Dressing board

Dressing the blade through a dressing board could reduce defective rate and enhance the efficiency of dicing blade.



Specification and size of dicing blade

Diamond		Grit size		Concentration		Bond	Type	Shape
SDC	Coated Dia	#200 #230	#400 #600	100 75 50	H M L	BCW HBCW	Resin Hybrid	1A8
SD	Diamond	#270 #325	#800 #1000			MCR	Metal	

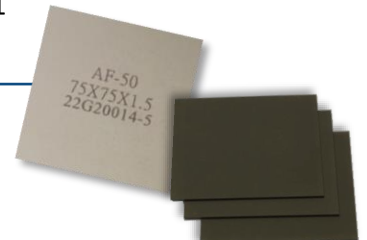


Size			unit : mm
Bond	Diameter(D)	Thickness (T)	Hole(H)
BCW HBCW	52 - 78	0.1 – 0.35 up	40
MCR	52 - 59 76 - 78	0.1 – 0.35 up 0.3 – 0.4 up	

Specification and size of dressing board

Specification	For (Hub blade) grit size	Size unit : mm
AF-20	#1700	75 X 75 X 1 75 X 37.5 X 1
AF-30	#1800 - #3000	
AF-40	#3500 - #4000	
AF-50	#4500 ↑	

■ Comparison chart of dressing board and dicing blade.

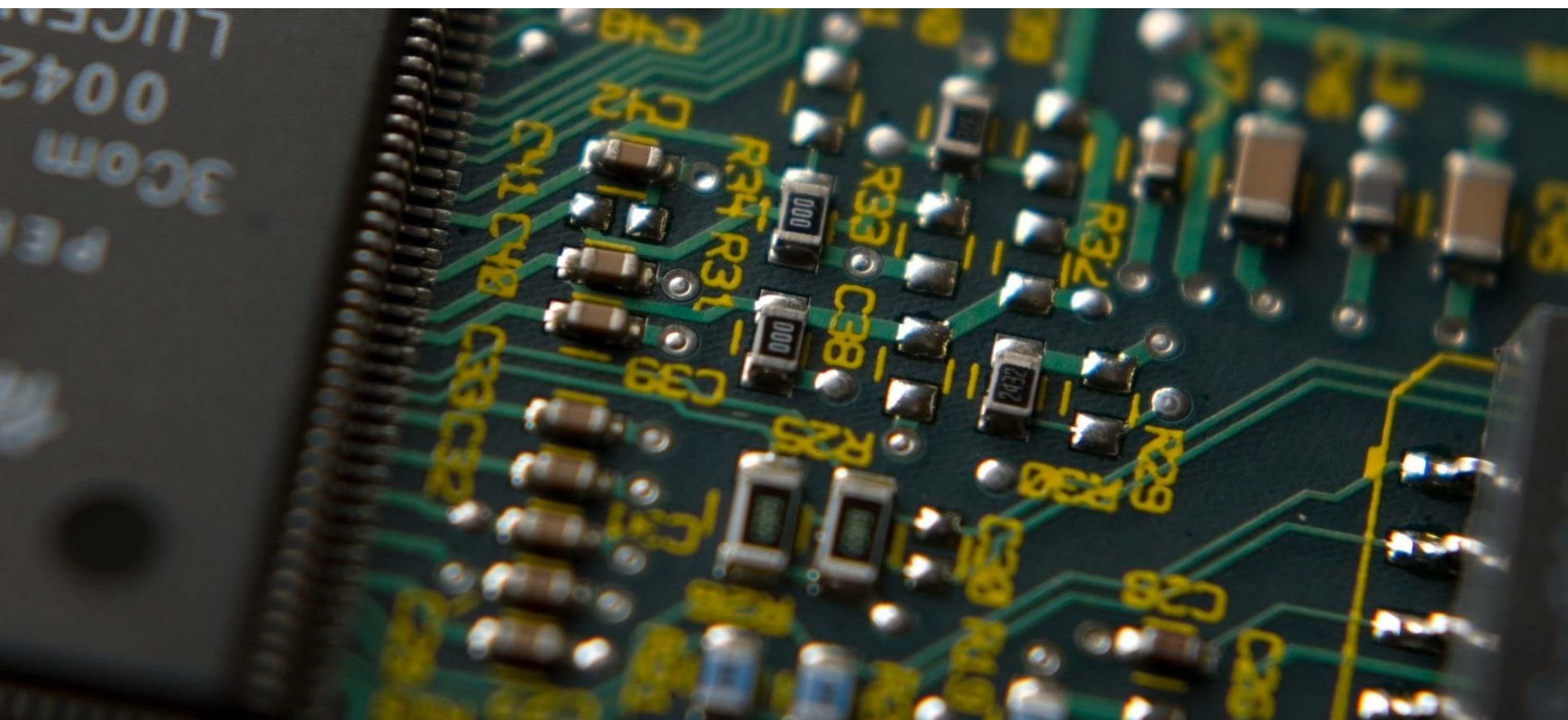


Grinding wheels for passive components

Applied in the grooving process of wire wound inductor components. With good cutting ability and life time.

Ccenterless grinding wheel

Centerless grinding is performed on the outer circle of the magnetic core of the component. The grinding wheel has the characteristics of high precision, high productivity, and has a long life time.



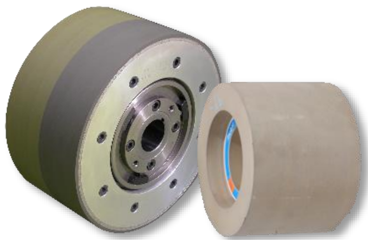
Specification and size of Grinding wheels for passive components

Abrasive	Grit size	Hardness	Concentration	Bond	Shape	Wheel size
SD	200	N	75	MFD	14A1	125(D) X 10(T) X 22.225(H) X (U) X 3(X)

■ Wheel size could be customized by the machine type.

Work piece	Wire wound inductor
Material	Manganese zinc ferrite magnet
Wheel speed	10000 rpm
Groove width	0.48 mm
Result	The processing efficiency and life time are both better than competitor, and the measured groove width is 0.465mm.

Centerless grinding wheel



Abrasive	Grit size	Hardness	Concentration	Bond	Shape	Wheel size
SDC	80/100 170/230	N	100	BCG	9A1	350(D) X 125(T) X 127(H) X 5(X)

■ Wheel size could be customized by the machine type.

Work piece : Ferrite core grinding

Iron core magnet cutting off grinding wheel

Abrasive	Grit size	Hardness	Concentration	Bond	Shape	Wheel size
CBN	120	N	100	BCW	1A1R	125(D)X0.5(T)X40(H)X0.4(E)X5(X)

■ Wheel size could be customized by the machine type.

Work piece	magnet cut off
Material	Rubidium iron boron magnet
Wheel speed	7000 rpm
Cutting depth	8.65mm (work size 90mm X 50mm X 8.5mm)
Cutting speed	0.55 m/s
Result	Every 1000 cuts consumes about 0.7mm, which is about 3-5 times longer than competitor.

Double Disc

Abrasive	Grit size	Hardness	Concentration	Bond	Shape	Wheel size
SDC	120	R	75	BDG	6A2	355(D)X50(T)X40(H)X35(E) X87.5(W)X3(X)

■ Wheel size could be customized by the machine type.

Work piece	Powder iron core magnet
Material	Rubidium iron boron magnet
Hardness	HRC 55
Machine	WAIDA-WGL-35
Wheel speed	700-1000 RPM

Anchor®

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