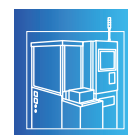


# DICING BLADES



Range & Solutions

## Full Dicing Solutions



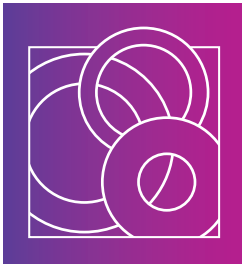
Saws



Blades



Peripherals



## ADT DICING BLADES

ADT specializes in the manufacturing of annular diamond dicing blades. ADT blade's range includes Hubless Resin, Metal-sintered and Nickel blades, as well as Hub blades. ADT blades are the perfect solution for dicing a variety of materials and substrates such as QFN, BGA, ceramic, glass, quartz, sapphire and more. Responding to ever-growing customer demands and special requirements, ADT offers customized solutions for challenging materials and applications.



### DICING BLADES ADVANTAGES



#### R&D

Tailor-made solution per application



#### Application Lab

Application test with full process solution



#### Materials

Vast solutions for multiple applications



#### Diamonds

High-quality



#### Repeatability and versatility



#### Support

Global customer support



#### Quality

100% blades quality inspection

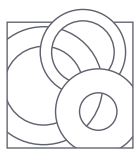


#### Experience

Over 50-years of know-how and experience

### QUALITY STANDARDS





## Resin Blades

### Soft bond for hard material.

Resin binder enables blade wear management.

Resin-bond Blades are an excellent choice for hard and brittle materials such as: QFN/MLF, Thick Ceramic substrates, HTCC and Glass.



**Blade thickness:** 75 – 2500µm

**Diamond grit size:** 3 – 250µm

**Available with various edge shapes**

Diamond grit size (µm)	Product	Material	Matrix
35 up to 53	Ceramic Packages, Sensors	Alumina / AlN	C02/C07
53 up to 88	QFN (Half Etched) + Wettable QFN (Full cut)	Cu leadframe + molding	D02/D07
53 up to 88	QFN (Full Cu)	Cu leadframe + molding	E01
35 up to 53	DFN (0.3 – 0.5mm)	Cu leadframe + molding	E31/D02
53 up to 88	Wettable QFN First cut	Cu leadframe + molding	P07
30 up to 45	SAW Devices, RF Package	HTCC	QKP/C02
30 up to 53	CCD / Filter / Lens	Glass / Quartz	QKP/E33
45 up to 63	Optical & Electro Optical Components	Sapphire	QKP
30 up to 53	Passive & Active Devices. Communication Modules	LTCC	QKP

## RESIN BLADES PART NUMBER DESCRIPTION

EDGE TYPE	O.D. & I.D.	GRIT SIZE ** (µm)	THICKNESS* (mil)
<b>0</b> = Standard edge	<b>1</b> = 2.188" x 40mm <b>K</b> = 4.45" x 88.82mm	<b>(003)</b> = 3	<b>(0.03)</b> = 3
<b>4</b> = Blade I.D. 3.5" (88.9mm)	<b>2</b> = 4.256" x 88.82mm <b>J</b> = 57mm x 40mm	<b>(006)</b> = 6	
	<b>3</b> = 3.0" x 40mm <b>M</b> = 50mm x 40mm	<b>(009)</b> = 9	
	<b>4</b> = 4.5" x 88.82mm <b>N</b> = 52.5mm x 40mm	<b>(015)</b> = 15	
	<b>5</b> = 5.0" x 88.82mm <b>P</b> = 78mm x 40mm	<b>(020)</b> = 20	
	<b>6</b> = 4.6" x 88.82mm <b>R</b> = 64mm x 40mm	<b>(025)</b> = 25	
	<b>7</b> = 4.7" x 88.82mm <b>S</b> = 66mm x 40mm	<b>(030)</b> = 30	
	<b>8</b> = 2.25" x 40mm <b>T</b> = 74mm x 40mm	<b>(035)</b> = 35	
	<b>9</b> = 2.5" x 40mm <b>U</b> = 76.4mm x 40mm	<b>(045)</b> = 45	
	<b>A</b> = 53mm x 40mm <b>Q</b> = 4.8" x 88.82mm	<b>(053)</b> = 53	
	<b>B</b> = 51mm x 40mm <b>W</b> = 72mm x 40mm	<b>(063)</b> = 63	
	<b>C</b> = 56mm x 40mm <b>L</b> = 80mm x 40mm	<b>(075)</b> = 75	
	<b>D</b> = 52mm x 40mm <b>V</b> = 55m x 40mm	<b>(088)</b> = 88	
	<b>E</b> = 54mm x 40mm <b>X</b> = 59mm x 40mm	<b>(105)</b> = 105	
	<b>F</b> = 60mm x 40mm <b>Y</b> = 77mm x 40mm	<b>(125)</b> = 125	
	<b>G</b> = 4.4" x 88.82mm <b>Z</b> = 75mm x 40mm	<b>(150)</b> = 150	
	<b>H</b> = 58mm x 40mm	<b>(200)</b> = 200	

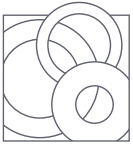
  

Example part number	<b>X 0 777 - 4 006 - 010 - XXX</b>	Product family
<b>Standard Edge</b>	<b>4.5" O.D. x 88.82 mm I.D.</b>	<b>6 µm Grit</b> <b>10 mil Thickness</b>

\* Depends on diamond grit size

\*\* Depends on blade thickness and diamond grit size

Other thickness options, diameters, edge geometries and diamond grit size are available upon request.



# Sintered Blades

With a slower wear rate than Resin but faster than Nickel, Metal-bond (Sintered) blades are best suited for retaining package shape and size in applications such as: BGA, Soft Alumina, TiC, LTCC, Ferrite.



**Blade thickness:** 80 – 1500µm

**Diamond grit size:** 2 – 70 µm

**Serrations:**

Serrations available for sintered blades as well as various edge shapes

Diamond grit size (µm)	Product	Material	Matrix
45 up to 55	BGA , LGA (Tape & Tape-less mounting method)	FR4, Plastic & molding	C2/R5
30 up to 50	QFN ( Half Etched)	Cu leadframe + molding	Q7/C1
35 up to 45	Passive & Active Devices. Communication Modules	LTCC	P1/P9
35 up to 45	SAW Devices, RF Package	HTCC	P1
13 up to 25	Camera Module	Glass/ IR Glass	P1/P5
25 up to 45	Ceramic Packages	Alumina	P5/P9

## METAL SINTERED BLADES PART NUMBER DESCRIPTION

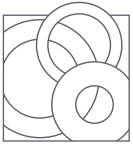
THICKNESS TOLERANCE*	EDGE GEOMETRY**	O.D	I.D.	GRIT SIZE ** (µm)	THICKNESS* M=mm, I=tenths
2 = ± .0001"	0 = Standards	2 = 4.8"	1 = 3.5"	0A = 3-6	(080) = 80
3 = ± .0002"	N = Non Standard	3 = 4.7"	2 = 88.82mm	02 = 1-2	
4 = ± .0005"	<b>SERRATED</b>	4 = 4.6"	6 = 40mm	03 = 2-4	
B = ± .0003"	A = x16 slots (for 2" blades)	5 = 4.5"		07 = 6-8	
	A = x60 slots (for 4" blades)	6 = 4.4"		10 = 10	
	B = x32 slots (for 2" blades)	7 = 4.3"			
		8 = 4.256"			
		9 = 4.0"			
		A = 3.0"			
		B = 2.5"			
		C = 2.25"			
		D = 2.188"			
		E = 2.0"			
		F = 58mm			
		H = 77mm			
		I = 60mm			
		K = 54mm			
		L = 82mm			
		M = 56mm			
		N = 75mm			
		P = 52mm			
		S = 2.75"			
		T = 78mm			
		Z = 74mm			
		W = 79mm			
Example part number	<b>4S0 3 0 - 5</b>	<b>2</b>	<b>10 - 120-I</b>	<b>XX</b>	Product family
± .0002"	Standard	4.5" O.D.	88.82 mm	10 µm Grit	12 mil Thickness

\* Depends on diamond grit size

\*\* Depends on blade thickness and diamond grit size

Other thickness options, diameters, edge geometries and diamond grit size are available upon request.





# Novus for BGA Application

## NOVUS

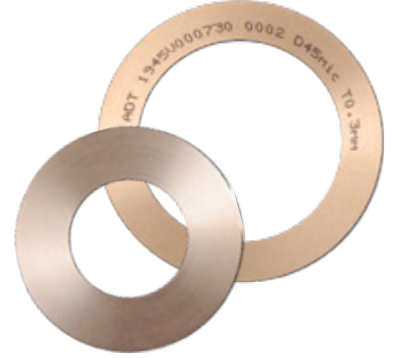
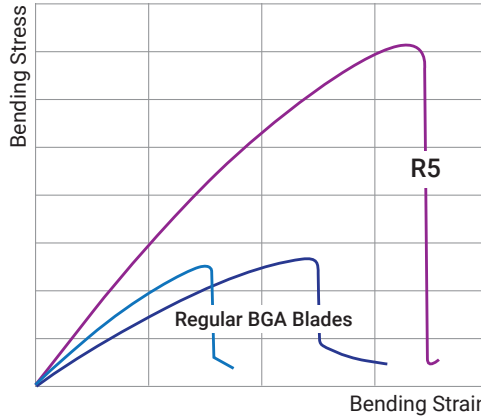
Superior Dicing Blades  
for BGA/LGA/SIP Package

Durability, Low Wear & Stiffness

**Blade:**

**Feed rate:** up to 250 mm/sec

**Blade life** can exceed 15,000 m



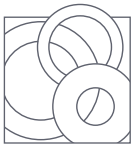
### NOVUS - METAL SINTERED BLADES PART NUMBER DESCRIPTION

THICKNESS TOLERANCE*	EDGE GEOMETRY**	O.D	I.D.	GRIT SIZE ** (µm)	THICKNESS* (micron only)
2 = ± .00010"	0 = Standards	A = 3.0"	6 = 40mm	OA = 3-6	(150) = 150
3 = ± .00020"	N = Non Standard	B = 2.5"		OB = 4-6	↓
		C = 2.25"		02 = 1-2	
		D = 2.188"		03 = 2-4	
		E = 2.0"		07 = 6-8	
		F = 58mm		10 = 10	(300) = 300
		H = 53mm		12 = 8-16	
		I = 60mm		↓	
		K = 54mm		50	
		M = 56mm			
		N = 75mm			
		P = 52mm			
		S = 2.75"			
		Q = 5305mm			
		V = 55mm			
		Y = 52.5mm			
		0 = 51.8mm			
		1 = 53.2mm			
		2 = 51.4mm			
		4 = 51.5mm			

Example part number	<b>RSXX X - X 6 X X- XXX-M XX</b>	Product family
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\* Depends on diamond grit size  
 \*\* Depends on blade thickness and diamond grit size  
 Other thickness options, diameters, edge geometries and diamond grit size are available upon request.



## Dicing Blades | Range and Technical Data

### Nickel Blades

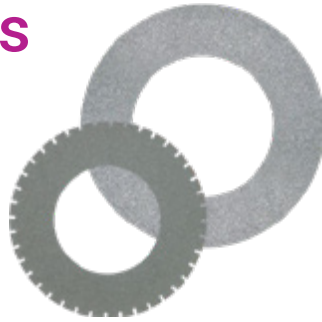
The Nickel binder provides longer blade life and lower wear rate. Nickel-bond Blades are a perfect choice for soft material applications such as: PCB, Silicon and BGA.

**Blade thickness:** 50 – 300µm

**Diamond grit size:** 3 – 50µm

**Serrations:**

Serrations available for Nickel blades as well as various edge shapes



### Steel Core Nickel Blades

Best suited for applications such as Green Ceramic, BGA (Tape process).

Only the rim (the cutting edge of the blade) is composed of nickel and diamonds.

**Blade thickness:** 300 – 750µm

**Diamond grit size:** 10 – 70µm

**Serrations:**

Serrations available for Steel Core Nickel blades as well as various edge shapes



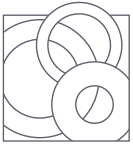
Diamond grit size (µm)	Product	Material	Matrix
30 up to 50	Ceramic / Capacitors	Green Ceramic	BLB/BLO
10 up to 30	PCB / LED Package	FR4 / Epoxy & Cu	BLZ,BLV,BLT
6–8 up to 10	Medical Ultrasound Sensors	PZT	A0T
2–4 up to 4–8	IC's	Silicon	Hub blades

### NICKEL - BOND BLADES PART NUMBER DESCRIPTION

I.D.	O.D.	GRIT SIZE (µm)	O.D SHAPE	EDGE GEOMETRY**	THICKNESS* (mil)	THICKNESS TOLERANCE*
0 = 88.82mm	0 = 4.34"	(1) = 2-4	0 = Standard	0 = Standard	(008) = 8	A = ± .0001***
1 = 40mm	1 = 4.256"	(2) = 3-6	1 = Standard	1 = Pre-dressed		B = ± .0002***
3 = 2.75"	2 = 2.188"	(3) = 10				C = ± .0003"
4 = 3.5" (88.9mm)	3 = 3"	(4) = 17	2" x 16 slots			D = ± .0005"
5 = 3"	4 = 4.6"	(5) = 30	3" x 40 slots			F = ± .0010"
8 = 55mm	5 = 5"	(6) = 50	4" x 60 slots			
9 = 52mm	7 = 4.4"	(9) = 10-15	5" x 60 slots			
	8 = 4.8"	(B) = 6-8				
	9 = 4.5"	(C) = 25				
	C = 95mm					
	D = 93mm					
	E = 78mm					
	G = 4.3"					
	H = 77mm					
	K = 98mm					
	L = 75mm					
	M = 4.7"					
	S = 4.36"					

Example part number	<b>X 4 776 -8 2 0 1 - 070 -C XX</b>	Product family
3.5" I.D.	4.8" O.D.	3-6 µm Grit
		Standard
		Pre-dressed
		7 mil Thickness
		± .0003"



## Dicing Blades | Range and Technical Data

### NICKEL BLADES PART NUMBER DESCRIPTION

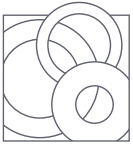
I.D.	O.D.	GRIT SIZE ( $\mu\text{m}$ )	O.D SHAPE	THICKNESS* (mil)	THICKNESS TOLERANCE*
<b>Special 2" Nickel Blade Designator 40mm I.D. only</b>	0 = 55mm	(1) = 2-4	0 = Standard	(008) = 8	A = $\pm .0001$ ***
	1 = 50.1mm	(2) = 3-6	1 = Pre-dressed		B = $\pm .0002$ ***
	2 = 50.2mm	(3) = 10	2 = Standard serration (x16 slots)		C = $\pm .0003$ "
	3 = 50.4mm	(4) = 17			D = $\pm .0005$ "
	4 = 50.6mm	(5) = 30			F = $\pm .0010$ "
	5 = 50.8mm	(6) = 50			
	6 = 51mm	(9) = 10-15			
	7 = 51.2mm	(B) = 6-8			
	8 = 51.4mm	(C) = 25			
	9 = 52mm				
	A = 58mm				
	B = 56mm				
	C = 54mm				
	D = 60mm				
	E = 50.5mm				
	F = 51.5mm				
	G = 58.2mm				
	L = 54.5mm				
	M = 2.25"				
	P = 61.6mm				
Q = 53mm					
R = 52.8mm					
S = 51.8mm					
T = 51.6mm					
J = 59mm					
Example part number	<b>4B776-3 2 3 1 -045 -B XX</b>				
	40 mm I.D.	50.2 mm O.D.	10 $\mu\text{m}$ Grit	Pre-dressed	4.5 mil Thickness
					Product family

\* Depends on diamond grit size

\*\* Depends on blade thickness and diamond grit size

\*\*\* All special 2" Nickel blades have an I.D. of 40mm

Other thickness options, diameters, edge geometries and diamond grit size are available upon request.



# Hub Blades

A perfect solution for the optimization of the dicing process for various types of materials such as: Silicon, GaAs and other wafers.

**Our hub blades provide:**

- Improved cut quality
- Longer blade life
- Higher UPH

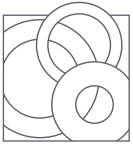


## HUB BLADES PART NUMBER DESCRIPTION

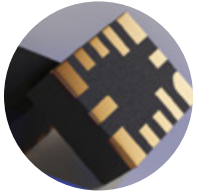
0	757	-	5	3	40	-	115	-	2	00
Special Definition	Product Family		Grit Size Mesh [µm]	Diamond %	Max. Thickness µm		Min. Exposure µm		Bond Hardness	Special Definition
			1 = 5000 (0.5 - 2) 2 = 4500 (1 - 3) 3 = 4000 (2 - 4) 4 = 3500 (2 - 5) 5 = 3000 (2 - 6) 6 = 2500 (3 - 5) 7 = 2000 (4 - 6) 8 = 1800 (4 - 8) 9 = 1700 (6 - 8) A = 1500 (5 - 10) B = 4800 (1 - 2)	1 - Low 2 3 - Med 4 5 - High	40		1150		1 = Soft 2 = Medium 3 = Hard	

	Exposure	250	380	510	640	760	890	1020	1150	1270
Thickness [µm]	Tolerance Range [µm]	250-380	380-510	510-640	640-760	760-890	890-1020	1020-1150	1150-1270	1270-1400
15	10-15	15 x 250	15 x 380							
20	17-20	20 x 250	20 x 380	20 x 510						
25	20-25	25 x 250	25 x 380	25 x 510	25 x 640					
30	25-30	30 x 250	30 x 380	30 x 510	30 x 640	30 x 760				
35	30-35	35 x 250	35 x 380	35 x 510	35 x 640	35 x 760	35 x 890	35 x 1020		
40	35-40	40 x 250	40 x 380	40 x 510	40 x 640	40 x 760	40 x 890	40 x 1020	40 x 1150	
50	40-50	50 x 250	50 x 380	50 x 510	50 x 640	50 x 760	50 x 890	50 x 1020	50 x 1150	50 x 1270
60	50-60	60 x 250	60 x 380	60 x 510	60 x 640	60 x 760	60 x 890	60 x 1020	60 x 1150	60 x 1270
70	60-70	70 x 250	70 x 380	70 x 510	70 x 640	70 x 760	70 x 890	70 x 1020	70 x 1150	70 x 1270
80	70-80	80 x 250	80 x 380	80 x 510	80 x 640	80 x 760	80 x 890	80 x 1020	80 x 1150	80 x 1270
90	80-90	90 x 250	90 x 380	90 x 510	90 x 640	90 x 760	90 x 890	90 x 1020	90 x 1150	90 x 1270
A0	90-100	100 x 250	100 x 380	100 x 510	100 x 640	100 x 760	100 x 890	100 x 1020	100 x 1150	100 x 1270
A1	100-110	110 x 250	110 x 380	110 x 510	110 x 640	110 x 760	110 x 890	110 x 1020	110 x 1150	110 x 1270
A2	110-120	120 x 250	120 x 380	120 x 510	120 x 640	120 x 760	120 x 890	120 x 1020	120 x 1150	120 x 1270





## PACKAGE SINGULATION



### QFN packages

ADT offers comprehensive dicing solutions for QFN packages including dicing saws, dicing blades and peripheral equipment.

#### Challenges:

- Tin (Sn) Dicing – Lead melting
- Ni/Pd – Blade breakage and short life
- Blade life
- Burrs and smearing

#### Blade:

**Resin matrix type:** E, D, P

**OD Ø:** 2", 3", 4"

**Diamond grit size:** 45 – 105 µm

**Thickness:** .008" – .020" (0.2 – 0.5 mm)

#### Process Parameters:

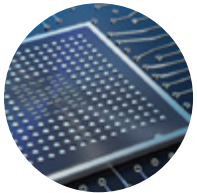
**Feed rate:** 20 – 100 mm/sec

**Spindle speed:**

2": 20 – 40 krpm

3": 15 – 25 krpm

4": 8 – 15 krpm



### BGA packages

ADT offers comprehensive dicing solutions for BGA including dicing saws, dicing blades and peripheral equipment.

#### Challenges:

- Blade life - Radial wear, thickness wear & maintaining package size
- Chipping

#### Blade:

**Metal Sintered matrix type:** C, R

**OD Ø:** 2", 3"

**Diamond grit size:** 35 – 70 µm

**Thickness:** .004" – .020" (0.1 – 0.5 mm)

#### Process parameters:

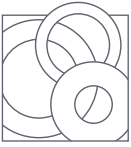
**Feed rate:** 20 – 250 mm/sec

**Spindle speed:**

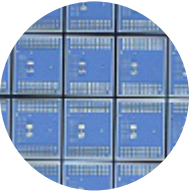
2": 30 – 45 krpm

3": 20 – 30 krpm

4": 8 – 15 krpm



## PACKAGE SINGULATION



### LTCC

Low Temperature Co-fired Ceramic (LTCC) substrates are fabricated by laminating individual unfired tapes with printed conductor lines on the surface on top of each other and firing them together in a single step. These products have a low dielectric constant, low dielectric loss and the ability to embed multiple layers of components in a multilayer structure.

#### Challenges:

Cut quality:

- Ceramic chipping
- Cracks | Metal burrs
- Package size

#### Blade:

**Resin matrix type:** Q, K, C

**OD Ø:** 2", 3", 4"

**Diamond grit size:** 15 – 45µm

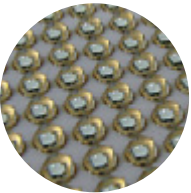
**Thickness:** .006" – .020" (0.15 – 0.5 mm)

#### Process Parameters:

**Feed rate:** 5 – 25 mm/sec

**Spindle speed:** 10 – 40 krpm depending on blade O.D.

Multi panel mounting on UV tape



### LED packaging

LED packaging usually consists of a base substrate upon which the LEDs are mounted.

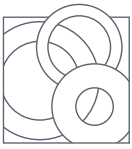
Common base substrates in the market are: Cermaic, PCB and EMC/MLF.

#### Challenges:

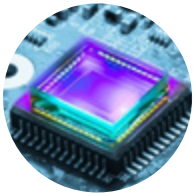
- Chipping
- Cracks
- Copper burrs
- Die size stability
- Low blade wear

#### Blade and process parameters:

ADT developed a dicing solution tailored to the specific package type: Ceramic, PCB and EMC/MLF



## MICROELECTRONIC COMPONENTS (MEC)



### Glass packages

ADT offers comprehensive dicing solutions for GLASS including dicing saws, dicing blades and peripheral equipment.

#### Challenges:

- Chipping (top & back)
- Blade life
- Cut perpendicularity

#### Blade:

**Resin matrix type:** Q, E30

**Sintered Metal matrix type:** P1

**OD Ø:** 2", 3"

**Diamond grit size:** 10 – 20 µm

**Thickness:** .004" – .012" (0.1 – 0.3 mm)

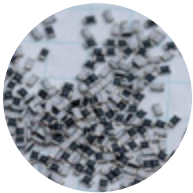
#### Process Parameters:

**Feed rate:** 2 – 20 mm/sec

**Spindle speed:**

2": 20 – 30 krpm

4": 8 – 15 krpm



### Ceramic (Alumina) packages

ADT offers comprehensive dicing solutions for ceramic including dicing saws, dicing blades and peripheral equipment.

#### Challenges:

- Chipping (top & back)
- Cut perpendicularity
- Blade life

#### Blade:

**Resin matrix type:** Q, C

**Sintered Metal matrix type:** P9

**OD Ø:** 2", 3", 4"

**Diamond grit size:** 30 – 88 µm

**Thickness:** .006" – .012" (0.15 – 0.3 mm)

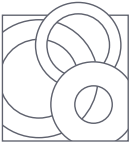
#### Process Parameters:

**Feed rate:** 2–20 mm/sec

**Spindle speed:**

2": 20 – 30 krpm

4": 10 – 15 krpm



## MICROELECTRONIC COMPONENTS (MEC)



### MLCC

Green Ceramic, A basic capacitor consists of two conducting electrodes separated by an insulating dielectric material. Multi-layer ceramic capacitors consist of a large number of closely spaced parallel electrodes between thin layers of a high-capacitance ceramic material.

#### Challenges:

- Nuisance dust in 'dry' dicing operations
- Blade clogging
- Layer smearing and shorting

#### Blade:

**4" Nickel (standard or serrated edge) and steel core Nickel Blades**

**OD Ø:** 2", 3", 4"

**Diamond grit size:** 30 – 70 µm

**Thickness:** .006" – .014" (0.15 – 0.35 mm)

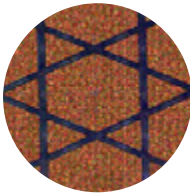
#### Process Parameters:

**Feed rate:** 50 – 250 mm/sec

**Spindle speed:** 12 – 30 krpm

Possible for both 'dry' and 'wet' dicing

Relatively frequent dressing to clean blade from debris



### PZT

Lead zirconate titanate (PZT) is a ceramic material which has piezo-electric properties (the material is electrically charged as a result of deformation/pressure). The most common application is for ultrasonic imaging in the medical industry. In most of the applications the PZT is diced vertically with series of shallow cuts.

#### Challenges:

- Very tight kerf-width tolerances
- Kerf perpendicularity
- Wall breakage
- Chipping
- High exposure / thickness ratio
- Kerf shape

#### Blade:

**2" Hub or Annular Nickel Blades**

**Diamond grit size:** 3 – 6 to 10 µm

**Thickness:** .0008" – .0030"

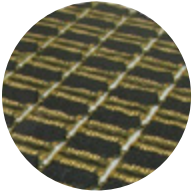
#### Process Parameters:

**Feed rate:** 1 – 6 mm/sec

**Spindle speed:** 20 – 30 krpm



## MICROELECTRONIC COMPONENTS (MEC)



### PCB

Printed Circuit Board (PCB) is composed of layers of copper and FR4/5 or BT resin. PCB is used as a substrate for mounting. Typical thickness is 0.3 mm to 2 mm.

#### Challenges:

Cut quality:

- Copper burrs
- Smearing

#### Blade:

**2" and 4" Nickel blades (serrated and standard edge):** T, V matrixes

**Diamond grit size:** 10 – 50  $\mu\text{m}$

**Thickness:** .003" – .012" (0.075 - 0.3 mm)

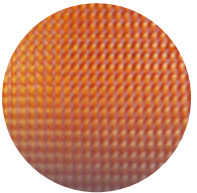
#### Process Parameters:

**Feed rate:** 50 – 150 mm/sec

**Spindle speed:**

2": 25 – 30 krpm

4": 12 – 20 krpm



### SAW devices

Surface Acoustic Wave (SAW) devices are components that make use of the ability of piezoelectric materials to convert acoustic (i.e. mechanical) waves into electromagnetic signals, and vice-versa. By far, the most common SAW devices are SAW Band Pass Filters (SAW BPF) which sort signals by frequency. The most widely used substrates are Quartz ( $\text{SiO}_2$ ), Lithium niobate ( $\text{LiNbO}_3$ ) and Lithium tantalate ( $\text{LiTaO}_3$ ) that are very brittle materials.

#### Challenges:

Cut quality:

- Chipping

#### Blade:

**2" Resin blades:** Q, K matrixes

**Thickness:** .004" – .008" (0.1 – 0.2 mm)

#### Process parameters:

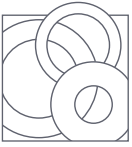
**Feed rate:** 5 – 20 mm/sec

**Spindle speed:**

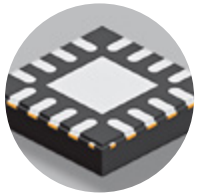
2": 15 – 30 krpm

4": 8 – 15 krpm





# AUTOMOTIVE



## Blades for Wettable H/E QFN



Scan to see ADT's unique laser mapping system for Wettable QFN dicing

Following the demand from the automotive industry for chip soldering that will withstand zero faults over time, ADT developed solutions for the wettable technology.

Designed to ensure the highest safety standards for the automotive industry:

- Wettable technology for optimal soldering results
- Visible soldering allowing 100% Automated Optical Inspection (AOI)

### 1<sup>st</sup> Cut - Shallow cut



### P07 matrix

Absorb and dissipate the heat during dicing to improve the cut quality by maintaining the blade edge shape and preventing the "W" phenomenon.

**Blade:**

**Resin matrix:** P07

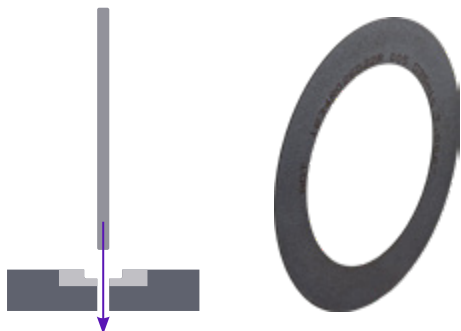
**OD:** Ø 2"

**Diamond grit size:** 45-88 µm

**Feed rate:** 20 – 40 mm/sec

**Spindle speed:** 20 – 25 krpm

### 2<sup>nd</sup> Cut - Cut Through/Singulation



### D02 matrix

Resin bond dicing blade.

Our leading matrix for QFN dicing, provides good cut quality with high blade life.

**Blade:**

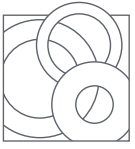
**Resin matrix:** D02

**OD:** Ø 2" – 3"

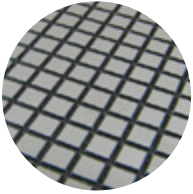
**Diamond grit size:** 45 – 88 µm

**Feed rate:** 50 – 80 mm/sec

**Spindle speed:** 22 – 30 krpm



## SEMICONDUCTOR DICING



### Silicon wafers and discrete devices

Silicon is the most common semiconductor material used. It is a gray brittle material with a diamond cubic structure. Silicon wafers are available in sizes up to 12" in diameter, with 6" and 8" being the most common. Typical thicknesses are in the 200 – 800 micron range.

#### Challenges:

- Cut quality: top-side and back-side chipping
- Cracking
- Wafer contamination due to ESD issues and poor cleaning

#### Blade:

**HUB and Annular Nickel blades**

**OD Ø:** 2"

**Diamond grit size:** 1500 – 5000 mesh

**Thickness:** 0.015 – 0.120 mm

#### Process Parameters:

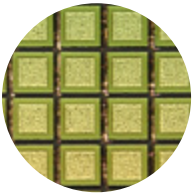
**Feed rate:** 10 – 120 mm/sec

**Spindle speed:** 30 – 50 krpm

**Mounting:** Blue or UV tape

**Cooling type:** DI water with and without additives

Carbon dioxide bubbler is optional



### LED – gallium arsenide

Gallium Arsenide (GaAs) is a semiconductor material characterized by a direct bandgap, which enables it to emit light which being use for the LED industry. The high speed of Gallium arsenide makes it well suited for use in RF devices such as cellular phones and in microwave devices that are mostly found in military applications such as radar and smart weapons. Gallium arsenide is considered hazardous in nature due to its high content of arsenic..

#### Challenges:

- Cut quality: top-side and back-side chipping
- Cracking due to crystallographic structure of the material
- Toxicity of GaAs dust

#### Blade:

**HUB and Annular Nickel blades**

**OD Ø:** 2"

**Diamond grit size:** 1500 – 5000 mesh

**Thickness:** 0.015 – 0.120 mm

#### Process Parameters:

**Feed rate:** 10 – 120 mm/sec

**Spindle speed:** 30 – 50 krpm

**Mounting:** Blue or UV tape

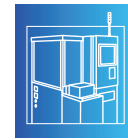
**Cooling type:** DI water with and without additives

Carbon dioxide bubbler is optional

# ADT - Advanced Dicing Technologies

ADT is a one stop shop with end-to-end research, development and production, specializing in the development and manufacturing of **dicing saws, blades and peripherals** for a wide variety of applications: silicon- based ICs, Package Singulation and hard material Microelectronic Components (MEC). Our R&D department is known for combining deep technological know-how, vast experience and out-of-the-box solutions.

## Full Dicing Solutions



Saws



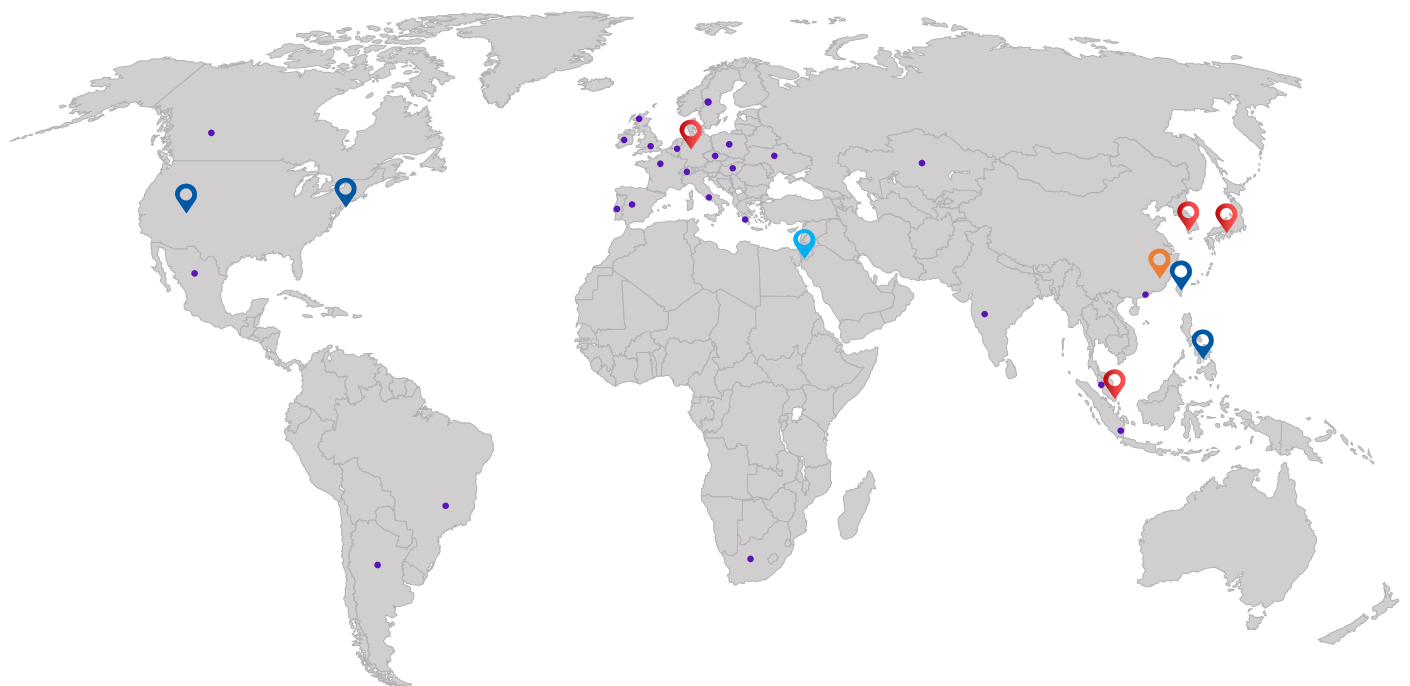
Blades



Peripherals

## ADT Worldwide

ADT offers a worldwide network of distributors, sales agents and independent representatives in Asia, USA and Europe, accompanied by a dedicated global service support team.



Corporate HQ

ADT International

ADT Offices

Regional

Reprs / Dist.

### ADT INTERNATIONAL HQ – Yokneam, Israel

Two main production facilities:

- Dicing Consumables (blades)
- Dicing Equipment (Saw & Peripherals)

Global Marketing & Sales department, Engineering and R&D, Logistics, Maintenance & technical support.

### ADT REGIONAL OFFICES

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- ADT Philippines
- ADT Singapore & Malaysia
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- ADT Inc. – West Coast AZ, USA



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