

Cut-Off Wheels

Cut-Off Wheel Line-up Which Supports Wide Range of Applications

DISCO's cut-off wheels are resilient, have high elasticity, and are able to achieve precise thickness accuracy and excellent cutting performance

DISCO's resinoid and rubber cut-off wheels achieve excellent cutting performance with their high elasticity, high thickness accuracy, and high resilience by controlling three elements: abrasive, bond material, and pores. In addition to the general and high precision cut-off wheels, DISCO has developed an affordable series which standardizes the most essential specifications in order to respond to the diverse needs of customers. The ultra-thin cut-off wheel, which is 0.05 mm thick and has a thickness tolerance of ± 0.002 mm, has also been added to the lineup. This cut-off wheel was awarded the "Top Ten New Products Award" by Nikkan Kogyo Shimbum in 1968. These cut-off wheels support a wide range of applications for precision processing, including electronics.



Line-up

Standard Series



NC-S

By developing a specification suited to frequently-used sizes and compatible materials, in addition to easier selection of the type, the price of NC-S is also affordable.

General and High Precision Cut-Off Wheels (Manufactured to order)



NC

NC is the standardized precision product. This cut-off wheel is manufactured using a special method and is effective for both dry and wet processes. Especially in dry process, it achieves an ideal cutting result with less burring and burns.



NC-P (B30)

NC-P (B30) is effective in processes which require high thickness accuracy using precision cutting equipment. Grit size: F60 - 180



NC-P (B50)

The NC-P (B50) is suited to processes which require a higher-quality cutting surface finish compared to that of B30, such as narrow tube processes. Grit size: F240 - 1200



DR

DR is a cut-off wheel with a bonding material made from high-quality natural rubber and synthetic rubber. It has excellent elasticity and is dedicated for wet processes. It is suited for the mass production of materials such as general steel material, tungsten and molybdenum.



NC-HP (GD)

NC-HP (GD) is a diamond resinoid cut-off wheel which is composed of diamond for the abrasive and resin for the bonding material. This cut-off wheel is excellent at processing hard and brittle materials such as carbide, ceramics, and glass, and realizes high-quality cutting performance and a long life.

Ultra-Thin Cut-Off Wheel



MIC / UT

This ultra-thin cut-off wheel has a thickness of 50 μ m. The MIC and UT types are good for cutting and grooving processes in electronics. There are a number of proven results in precision processing including the processing of fountain pen tips and molding.

Cut-Off Wheels

Specification

NC-P

A

100

N

B

150×0.5×25.4

Outer diameter × Thickness × Inner diameter (mm)

Type	Feature	Grinding material	Grit size F	Grade	Bonding material
NC	Standard precision	A	30 - 1200	H	B Resin
DR		WA		J Soft	BR Rubber
NC-P(B30)	High precision	PA		L	Medium
NC-P(B50)		HA		N	
NC-HP		C		P	
MIC and UT	Ultra-thin	GC		R Hard	T

Applications (Features)

Category	Symbol	Name	Examples of compatible materials
Alumina	A	Regular fused alumina	General carbon steel (S-C), carbon tool steel (SK)
	WA	White fused alumina	Bearing steel (SUJ), stainless steel (SUS)
	PA	Ruby fused alumina	Chrome steel (SCr), special steel (SNCM)
	HA	Mono-crystalline fused alumina	High speed steel (SKH), chrome molybdenum (SCM)
Carbide	C	Black silicon carbide abrasive	Aluminum, casting
	GC	Green silicon carbide abrasive	Tungsten, titanium, inconel, copper, glass
	GD	Diamond	Carbide, ceramics

How to Use

■ Appropriate size for flange

Category	Flange diameter
NC/NC-P/NC-HP	$(\text{Wheel outer diameter} - \text{Wheel inner diameter}) / 3 + \text{Wheel inner diameter}$

■ Recommended circumferential velocity (m/min)

Category	Dry	Wet
Metal	2,200 - 3,700	1,800 - 2,200
Non-metal	1,800 - 2,700	1,400 - 1,800

Calculation formula of rotation speed

$$\text{Wheel rotation speed (min}^{-1}\text{)} = \frac{\text{Wheel circumferential speed (m/s)} \times 60 \times 1,000}{\text{Wheel outer diameter (mm)} \times 3.14}$$

Conditions

	Grit size	Grade	Wheel thickness	Rotation speed	Cutting speed	Coolant flow rate	Flange diameter
Durability	More ↑ Rough ↓ Less Fine	Hard ↑ N ↓ Soft	Thick ↑ ↓ Thin	Fast ↑ ↓ Slow	Slow ↑ ↓ Fast	High ↑ ↓ Low <small>Water volume affects water temperature.</small>	
Burns and burring	More ↑ Rough ↓ Less Fine <small>Burring only</small>	Hard ↑ ↓ Soft	Thick ↑ ↓ Thin	Fast ↑ ↓ Slow	Fast ↑ ↓ Slow	Small ↑ ↓ Large	
Slanted cut	More ↑ ↓ Less	Hard ↑ ↓ Soft	Thin ↑ ↓ Thick		Fast ↑ ↓ Slow		Small ↑ ↓ Large

Cut-Off Wheels

Standard Series

NC-S

NC-S standardizes the specifications to match the frequently-used sizes and compatible materials.

Type				A-CUT	WA-CUT	HA-CUT	GC-CUT	SUS-CUT
Compatible workpiece				General steel	Special steel	High-hardness steel	Non-ferrous material	Stainless narrow tube
Compatible material example				Carbon steel (S-C)	Alloy tool steel (SKS)	High-speed steel (SKH)	Titanium	Stainless steel (SUS)
				Carbon tool steel (SK)	Bearing steel (SUJ)	Chrome molybdenum steel (SCM)	Tungsten	Precious metal such as gold or silver
				Spring steel (SUP)	Stainless steel (SUS)		Stainless steel (SUS)	
Outer diameter D (mm)	Thickness T (mm)	Inner diameter H (mm)	Small box		Chrome steel (SCr)	Special steel (SNCM)	Each type of glass	
150	0.5	25.4	50	BSCA0001	BSCW0001	-	BSCG0001	BSCS0001
150	1.0	25.4	50	BSCA0002	BSCW0002	-	-	-
160	0.7	25.4	25	-	BSCW0009	-	BSCG0009	-
180	0.5	25.4	50	-	BSCW0010	-	BSCG0010	BSCS0010
205	0.8	25.4	25	BSCA0003	BSCW0003	BSCH0003	BSCG0003	BSCS0003
230	1.0	25.4	20	BSCA0004	BSCW0004	BSCH0004	-	-
255	1.2	31.75	20	BSCA0005	BSCW0005	BSCH0005	-	-
305	1.2	31.75	25	BSCA0006	BSCW0006	BSCH0006	-	-
355	2.0	31.75	25	-	BSCW0007	-	-	-
405	2.5	31.75	20	-	BSCW0008	-	-	-

Type				Diamond abrasive	
				DIA-CUT1	DIA-CUT2
Compatible material example				Ceramics	
Compatible material example				Cemented carbide	
				Hard glass	
				Quartz, crystal	
Outer diameter D (mm)	Thickness T (mm)	Inner diameter H (mm)	Small box		
150	0.5	25.4	1	BSCD0001	BSCD1001
180	0.6	25.4	1	BSCD0002	BSCD1002
205	0.7	25.4	1	BSCD0003	BSCD1003
230	0.8	25.4	1	BSCD0004	BSCD1004
255	1.0	31.75	1	BSCD0005	BSCD1005



DIA-CUT1



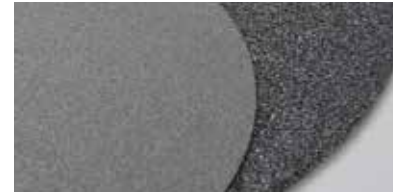
DIA-CUT2

Cut-Off Wheels

Resinoid Cut-Off Wheels (Manufactured to Order)

General and High Precision Cut-Off Wheels

DISCO's resinoid and rubber cut-off wheels are resilient and have excellent elasticity due to the special manufacturing method. In addition, they are able to realize high thickness accuracy.



Available Manufacturing Standard Size

	Outer diameter D (mm)	Outer diameter tolerance	Thickness T (mm)																	Standard hole diameters H (mm)		
			0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.3	1.4	1.5	1.6	1.8	2.0	2.2		2.4	2.5
General Cut-Off Wheels NC type (B10, B70) NC is the standardized precision product. This cut-off wheel is manufactured using a special method and is effective for both dry and wet processes. Especially in dry process, it achieves an ideal cutting result with less burring and burns.	100	+0.5 -0																		12.7/25.4		
	125																					
	150																		25.4/31.75			
	180																					
	205																					
	230																					
	255	±1.0																				
	305	±1.5																				
	355																					
	405	±2.0																				
General Cut-Off Wheels NC-P type (B30) NC-P (B30) is effective in processes which require high thickness accuracy using precision cutting equipment. Grit size: F60 - 180	50	+0.5 -0																		12.7/25.4		
	75																					
	90																		25.4/31.75			
	100																					
	125																					
	150																					
	180	±1.0																				
	205																					
	230	±1.5																				
	255																					
305																						
355																						
General Cut-Off Wheels NC-P type (B50) The NC-P (B50) is suited to processes which require a higher-quality cutting surface finish compared to that of B30, such as narrow tube processes. Grit size: F240 - 1200	50	+0.5 -0																		12.7/25.4		
	75																					
	90																		25.4/31.75			
	100																					
	125																					
	150																					
	180	±1.0																				
	205																					
	230	±1.5																				
	255																					
305																						
355																						
Rubber abrasive DR type DR is a cut-off wheel with a bonding material made from high-quality natural rubber and synthetic rubber. It has excellent elasticity and is dedicated for wet processes. It is suited for the mass production of materials such as general steel material, tungsten and molybdenum.	50	+0.5 -0																		12.7/25.4		
	75																					
	90																		25.4/31.75			
	100																					
	125																					
	150																					
180	±1.0																					
205																						

Standard grinding material grit size F

240	180	180	100	80	60	46	36	80
320	320	220	150	100	80	60	46	100
400	400	400	220	120	100	80	60	120
600	600	600	320	150	120	100		
						120		

■ Standard dimensions
 ■ Can be manufactured depending on grit size and grade
 ■ Standard thickness accuracy

Cut-Off Wheels

Resinoid Cut-Off Wheels (Manufactured to Order)

General and High Precision Cut-Off Wheels

GD Abrasive (Diamond Cutting Abrasive)

NC-HP (GD) is a diamond resinoid cut-off wheel which is composed of diamond for the abrasive and resin for the bonding material. This cut-off wheel is excellent at processing hard and brittle materials such as carbide, ceramics, and glass, and realizes high-quality cutting performance and a long life.

Available Manufacturing Standard Size

Outer diameter D (mm)	Outer diameter tolerance	Thickness T (mm)							Standard hole diameters H (mm)
		0.3	0.4	0.5	0.6	0.7	0.8	1.0	
50	+ 0.5 - 0	Standard dimensions		Standard thickness accuracy		Standard dimensions		12.7/25.4/40	
75		Standard dimensions		Standard thickness accuracy		Standard dimensions			
100		Standard dimensions		Standard thickness accuracy		Standard dimensions			
125	± 1.0	Standard dimensions		Standard thickness accuracy		Standard dimensions		12.7/25.4/31.75	
150		Standard dimensions		Standard thickness accuracy		Standard dimensions			
180		Standard dimensions		Standard thickness accuracy		Standard dimensions			
205	± 1.0	Standard dimensions		Standard thickness accuracy		Standard dimensions		25.4/31.75	
230		Standard dimensions		Standard thickness accuracy		Standard dimensions			
255		Standard dimensions		Standard thickness accuracy		Standard dimensions			
Standard grinding material grit size F		240/180			120/150				

■ Standard dimensions
 ■ Can be manufactured depending on grit size and grade
 ■ Standard thickness accuracy

Ultra-Thin Cut-Off Wheels

This is the world's first ultra-thin cut-off wheel and was awarded the "Top Ten New Products Award" by Nikkan Kogyo Shimbun in 1968. The ultra-thin cut-off wheel supports a wide range of applications for precision processing including electronics. The MIC type, which has a thickness of 0.1 mm or less (tolerance ± 0.002 mm), and the UT type, which has thickness of 0.1 mm or more (tolerance ± 0.01 mm), have been standardized.



Standard Sizes Available for Manufacturing

Outer diameter D (mm)	Outer diameter tolerance	Thickness T (mm)															
		MIC (Micron cut)					UT (Ultra cut)										
		0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.2
50	+ 0.03 - 0	Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy	
65		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy	
75		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy	
100	+ 0.05 - 0	Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy	
125		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy		Standard dimensions		Standard thickness accuracy	
Standard grinding material grit size F		1200			1000			600 800 1000			320 400 600			240 320 400 600			

■ Standard dimensions
 ■ Can be manufactured depending on grit size and grade
 The values in brackets () are the standard thickness accuracy. Standard hole diameter: 12.7, 25.4, 40 (mm)

UT Blade Exposure Dimensions

Thickness T (mm)				
0.1	0.15	0.2	0.25	0.3
10	15	20	25	30

MC Blade Exposure Dimensions

Thickness T (mm)				
0.05	0.06	0.07	0.08	0.09
2.5	3	3.5	4	4.5

All DISCO products are covered by product-liability insurance.

When Ordering

Please notify your DISCO sales representative of your product needs such as type, wheel size, and quality. When you place your first order, please explain the application information such as processed materials, dimensions, shape, the machine you are using, and any other conditions. We are ready to help you determine which product type is most suited for your application.

Note: Due to improvements to our products, it is possible that the product specifications may change without advanced notice. Please confirm the product specifications before ordering.



To ensure your safety when using these products, please carefully read and follow the instructions below to prevent any accidents or injuries caused by the breaking of the product (hereinafter "abrasive").

- USE a safety cover (nozzle case or cover), equipped as a standard accessory to avoid injury.
- DO NOT EXCEED the specified rpm limit indicated on the abrasive.
- FOLLOW the instruction manual of the equipment to mount the abrasive properly.
- DO NOT DROP OR HIT the abrasive. This may cause breakage or injury.
- Always CHECK the abrasive for chipping or any other damage before use.
- READ the operation manual of the cutting/grinding equipment before use.
- DO NOT USE the abrasive with modified or customized equipment.
- DO NOT USE an abrasive different from the size recommended for your machine (equipment).
- DO NOT USE the abrasive for any other purpose than grinding, cutting, or polishing.
- Always USE water or coolant to prevent damage to the abrasive.



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