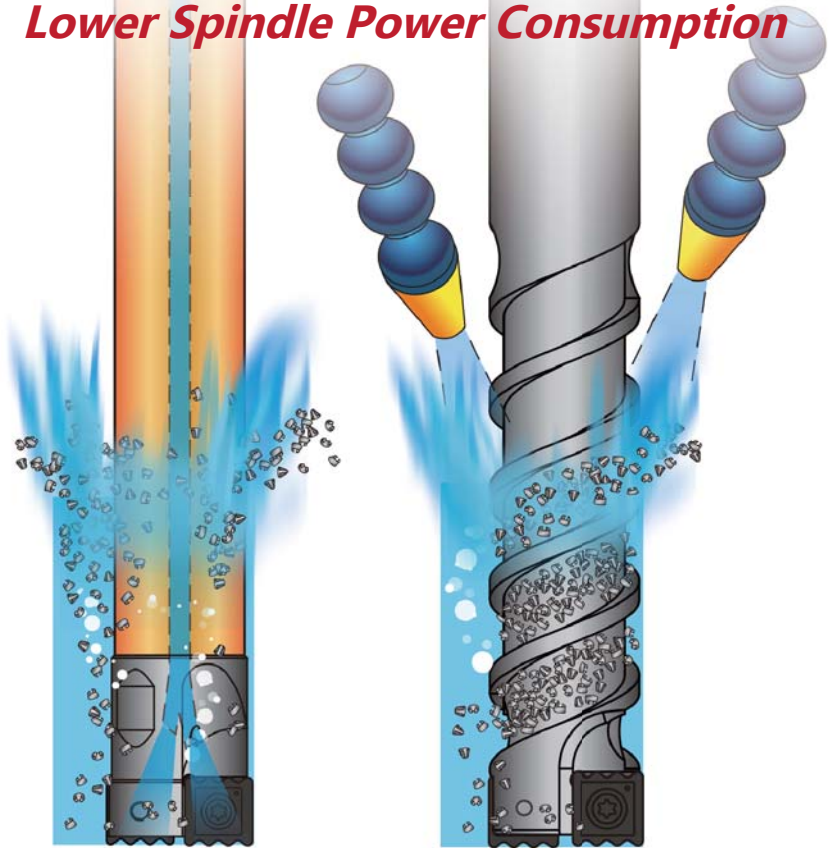







Cat. 02

NC Helix Drill

*One tool performs multiple functions
Lower Spindle Power Consumption*



- Only six tools for drilling $\varnothing 13 \sim \varnothing 65$ mm 
- One insert for all kind of materials 
- One tool performs multiple patterns 
- Chip removal expert - roughing and slotting 
- The drilling is performed by helical interpolation 
- (circular ramping milling, 20° Max. angle ramping.)

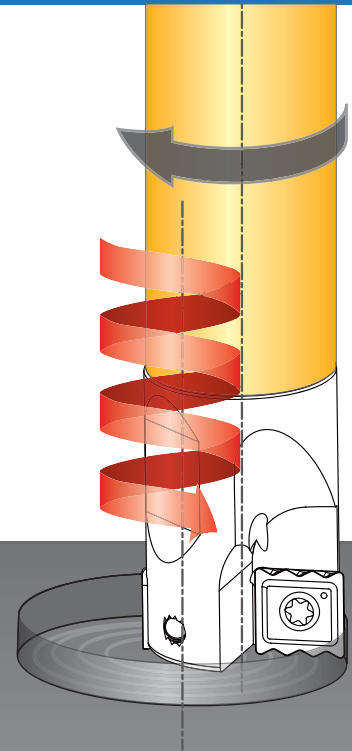


Principle and Benefit

The expert to remove excess materials - rough milling, drilling and slotting

One tool performs multiple functions.

It cuts a hole by helical interpolation; the serrated cutting edge makes cutting chip short and easily to be removed.



Feature 1

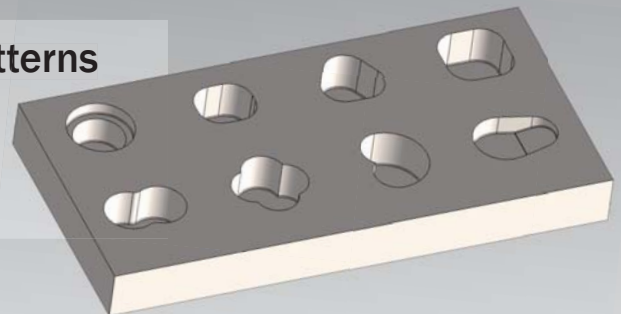
Lower Spindle Power Consumption Fast and Easy!

- Thanks to the small cutting load of the serrated cutting edge and helical interpolation, low power consumption of the spindle is required.
- Circular ramping milling, Maximum ramping angle is 20°

Feature 2

One tool performs multiple patterns

- Not only a drill, but an end mill tool.
- Small path radius to cut a hole or step hole, various shape of cavity on different materials.



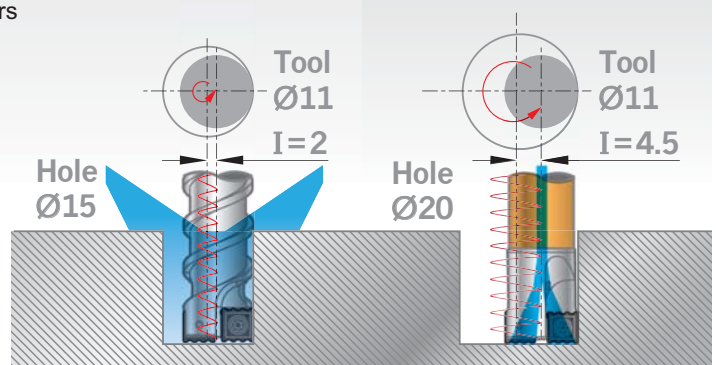
Feature 3

Only six tools for drilling $\text{Ø}13\sim\text{Ø}65$ mm

- The hole is cut by helical interpolation. Just one tool can machine different diameters and depth of holes.

• Example:

$\text{Ø}11$ NC Helix drill can drill $\text{Ø}15$ and $\text{Ø}20$, just programmed different circular radius $I=2\text{mm}$ and $I=4.5\text{mm}$.



Feature 4

Special geometry insert to cut different materials

- Serrated cutting edge makes the cutting chips short and small, therefore easier to be removed.
- For almost all kind of materials, excellent for soft and long cutting chip materials!, such as low carbon steel, stainless steel, Titanium and Inconel.
- Eliminate swarf and vibration problems while drilling difficult cut materials or deeper hole.



Chip

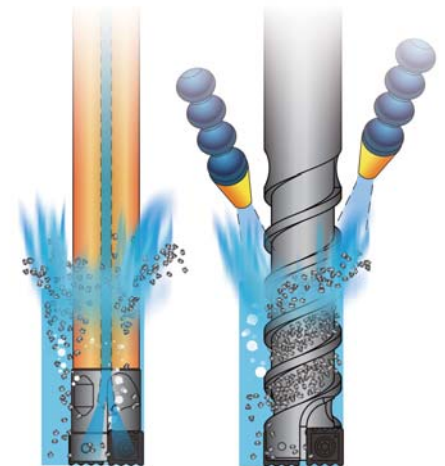
NC2032:

- * K20F micro grain carbide insert, TiAlN Coated.
- * One insert has 2 cutting edges.

Feature 5

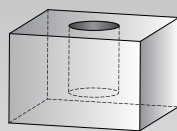
Two types of NC Helix drill for your options

- **Cylindrical Shank**
with helical groove is designed for CNC machines without internal coolant supply. The design of helical groove takes away the cutting chips while rotating.
- **Screw-fit Tool Holder**
is applicable to fit into almost all extension bars in the market. It has internal coolant through center, the cutting chips can be flushed out from hole together with the coolant.

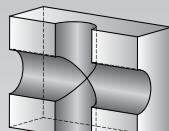


Feature 6

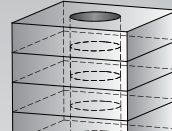
Applicable in different conditions



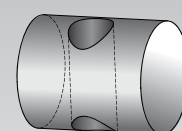
Regular Surface



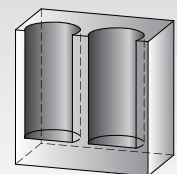
Cross Holes



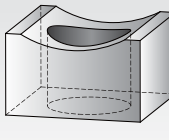
Stack Drilling



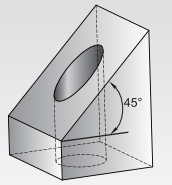
Round Work Piece Offset Drilling



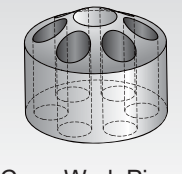
Partial Hole Drilling



Concave Surfaces



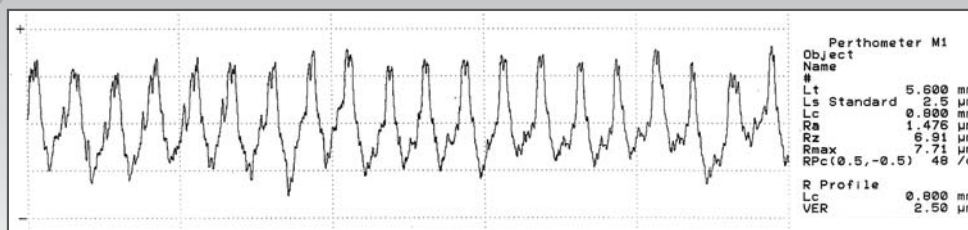
Angled Surfaces



Cone Work Piece Offset Drilling

Feature 7

Flatness Measuring



Flatness

Insert

NC2032:

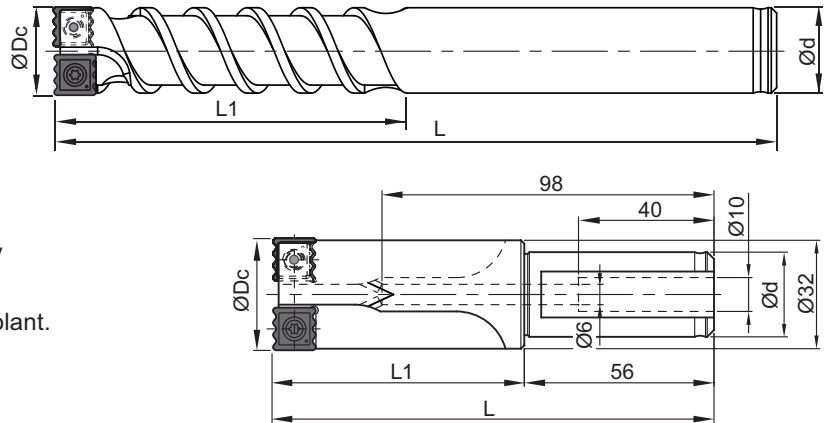
Micro grain carbide insert, one insert has 2 cutting edges.

Ordering Code	Grade	Coating	Dimensions			Screw	Key	
			L	S	Re			
01-N9MX04T002-NC2032	K20F	TiAlN		4.75	1.8	0.2	NS-18037 / 0.6Nm	NK-T6
01-N9MX05T103-NC2032				5.75	2.0	0.3	NS-20045 / 0.6Nm	NK-T6
01-N9MX070204-NC2032				7.5	2.4	0.4	NS-25045 / 1.2Nm	NK-T7
01-N9MX100306-NC2032				10	3.18	0.6	NS-30072 / 2.0Nm	NK-T9
01-N9MX12T308-NC2032				12.5	3.97	0.8	NS-35080 / 3.0Nm	NK-T15

Holder

Cylindrical Shank Helical Chip-Removing Groove

- Made from high alloy steel and hardened.
- Special designed helical groove generates coolant chip-removing-stream.
- The helical groove is designed to take swarf away from the cutting zone with the coolant.
- Designed for the CNC machines with external coolant.

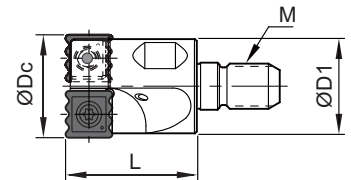


Ordering Code	Type	Capable of drill dia. mm		Ød	ØDc	L	L1	Max. Depth	Insert type	Max. ramping angle
		Dmin.	Dmax.							
00-99321-010-1320	BC10-HD11-1320	13	20	10	11	80	40	30	N9MX04T002	20°
00-99321-012-1525	BC12-HD13-1525	15	25	12	13	100	50	36	N9MX05T103	20°
00-99321-016-2030	BC16-HD17-2030	20	30	16	17	135	65	50	N9MX070204	20°
00-99321-020-2540	BC20-HD22-2540	25	40	20	22	170	80	60	N9MX100306	20°
00-99321-025-3050	BC25-HD27-3050	30	50	25	27	220	100	75	N9MX12T308	20°
*00-99321-025-4265	SL25-HD33-4265	42	65	25	33	130	74	50	N9MX12T308	9°

*00-99321-025-4265 is Ø25mm Side Lock Shank.

Screw Fit Cutter Centre Coolant

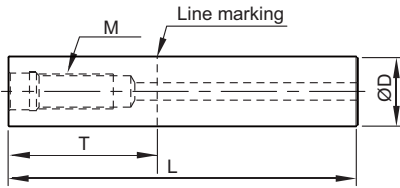
- The holder is made from high alloy steel and hardened, standard screw-fit body adapts to almost any kind of the screw-fit tool holder or extension bar in the market.
- Designed for the CNC machines with centre coolant.



Ordering Code	Type	Capable of drill dia. mm		ØDc	ØD1	L	M	Insert type	Max. ramping angle
		Dmin.	Dmax.						
00-99323-010-1320	M05-HD11-1320	13	20	11	10	20	M5	N9MX04T002	20°
00-99323-012-1525	M06-HD13-1525	15	25	13	12	25	M6	N9MX05T103	20°
00-99323-016-2030	M08-HD17-2030	20	30	17	16	25	M8	N9MX070204	20°
00-99323-020-2540	M10-HD22-2540	25	40	22	20	30	M10	N9MX100306	20°
00-99323-025-3050	M12-HD27-3050	30	50	27	25	35	M12	N9MX12T308	20°

■ Extension Bar - Steel Type

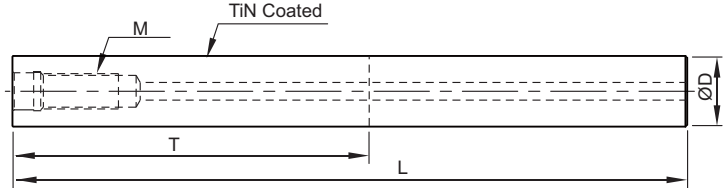
- T is the maximum overhang length.
- With internal coolant hole.



Ordering Code	Type	ØD	T	L	M
00-99801-12S	BC12-075M06S	12	25	75	M6
00-99801-16S	BC16-090M08S	16	35	90	M8
00-99801-20S	BC20-100M10S	20	40	100	M10
00-99801-25S	BC25-120M12S	25	50	120	M12

■ Extension Bar - Solid Carbide Type

- T is the maximum overhang length.
- With internal coolant hole.

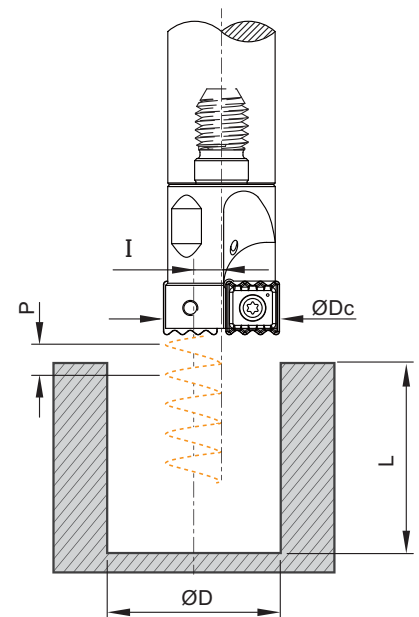


Ordering Code	Type	ØD	T	L	M
00-99801-10W	BC10-100M05W	10	60	100	M5
00-99801-12W	BC12-100M06W	12	60	100	M6
00-99801-16W	BC16-150M08W	16	80	150	M8
00-99801-20W	BC20-200M10W	20	100	200	M10
00-99801-25W	BC25-200M12W	25	125	200	M12

The NC Helix Drill is programing with "Helical interpolation" on CNC machine, the CNC controller must have 3-axis simultaneously motion function.

■ Cutting Parameters (S & F)

$S = \frac{V_c \times 1000}{D_c \times \pi}$	D _c = Dia. of Drill	mm
	D = Drilling diameter	mm
	L = Depth of Drilling	mm
$I = \frac{(D - D_c)}{2}$	V _c = Cutting Speed	m/min.
	S = Spindle Speed	r.p.m.
	f = Feed rate	mm/rev.
$F = S \times f$	F = Table feed rate	mm/min.
	d = Circular diameter	mm
	I = Circular radius	mm
$d = D - D_c$	P = Pitch of helical interpolation	mm



■ Cutting time (T)

$T = \frac{\pi \times d \times L \times 60}{F \times P} \text{ sec.}$	T = Cutting time	sec.
	d = Circular diameter (D-D _c)	mm
	L = Depth of Drilling	mm
	F = Table feed rate	mm/min.
	P = Pitch of helical interpolation	mm

■ Example

- Material : S45C (JIS)
- Tool : 00-99321-016-BC16-HD17, D_c= Ø17
- Insert : N9MX070204-NC2032

D: Ø30mm, L=20mm

S= (120 x 1000) / 17 / 3.14 = 2248 r.p.m.

F=S x f → 2248 x 0.26 = 584 mm/min.

P=4mm

(refer cutting data P for Carbon Steel 0.45%C)

d=D-D_c → 30-17 = 13 mm

$$T = \frac{3.14 \times 13 \times 20 \times 60}{584 \times 4} = 21 \text{ sec.}$$

$$Q = \frac{3.14 \times 30^2 \times 20 \times 60}{4 \times 1000 \times 21} = 40.3 \text{ cm}^3 / \text{min}$$

■ Chip removal Volume (Q)

$Q = \frac{\pi \times D^2 \times L \times 60}{4 \times 1000 \times T} \text{ cm}^3 / \text{min}$	Q = Chip removal volume	cm ³ / min
	D = Drilling diameter	mm
	L = Depth of Drilling	mm
	T = Cutting time	sec.



Just one tool can cut holes from $\varnothing 20$ to $\varnothing 30$ mm

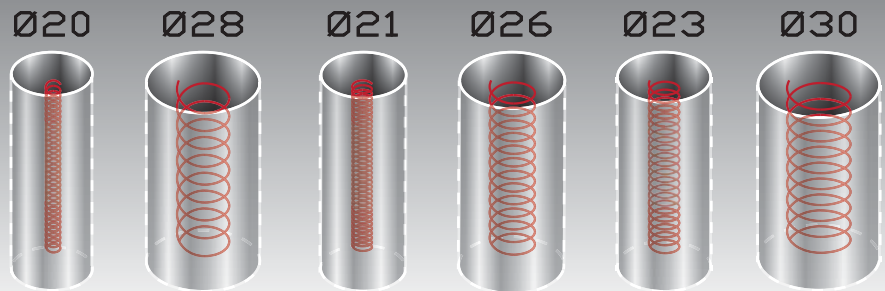
quickly and easy!



- Material : S50C (JIS)
- Tool : 00-99321-016-2030 BC16-HD17-2030
- Insert : N9MX070204-NC2032
- Coolant : **External coolant**



Up to 3xD with external coolant can drill direct. No need to peck drill or dwell in operation. Circular helical cutting is easy setting by NC machine program. Saving your tool inventory and cost!



Making a hole $\varnothing 60 \times 27$ mm only by one tool Eliminates 2nd operation from before process

Machine load 8%



- Work Material : Stainless Steel SS304
- Tool : 00-99321-025-4265 ($\varnothing 25$ mm Side Lock Shank)
- Insert : N9MX12T308-NC2032

■ Cutting Data:

Dc mm	D mm	L mm	Vc m/min.	S r.p.m.	f mm/rev.	F mm/min.	I mm	P mm	T sec.	Q cm ³ /mm
$\varnothing 33$	$\varnothing 60$	27	100	1000	0.2	200	13.5	4	172	26.6



BT30 Machine, Drilling hole Ø30, Drilling Depth 3.3xDc



- Work Material : S50C (JIS), High carbon steel
- Tool : 00-99321-020-2540 BC20-HD22-2540
- Insert : N9MX100306-NC2032
- Machine : BT30, 5.5 Kw < External coolant >

Maximum drilling capacity of the 5.5 kw spindle is Ø16 mm.

■ Cutting Data:

Dc mm	D mm	L mm	Vc m/min.	S r.p.m.	f mm/rev.	F mm/min.	I mm	P mm	T sec.
Ø22	Ø30	70	200	2893	0.2	600	4	2.8	62

* 3000 r.p.m. is used.

Only Low spindle power required!

- ▶ Drill bigger holes on a small spindle power machine, such as Tapping Center or small spindle power machine.
- ▶ One tool can make different diameter of holes, more flexible and less occupied tool magazine of CNC machines.



Reduce drilling cycle time. To make step hole Ø53.5 & Ø45 by one tool



- Work Material : S50C (JIS). High carbon steel
- Tool : 99323-LS32-HD40 (Non-standard size)
- Insert : N9MX12T309-NC2032
- Machine : BT40, 22.5 Kw < Centre coolant >

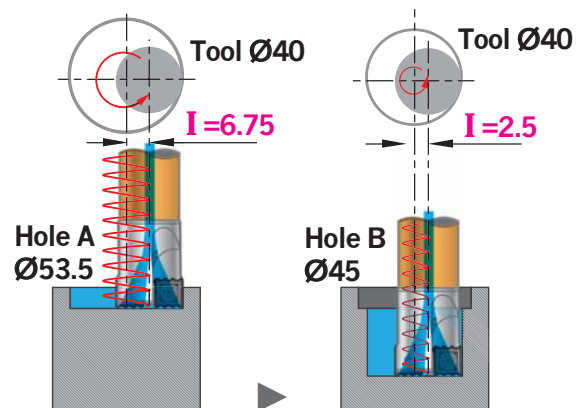
■ Cutting Data:

Hole	Dc mm	D mm	L mm	Vc m/min.	S r.p.m.	f mm/rev.	F mm/min.	I mm	P mm	T sec.
A	Ø40	Ø53.5	10	300	2400	0.15	360	6.75	5.0	14
B		Ø45.0	32	300	2400	0.15	360	2.5	2.0	42

■ Application:

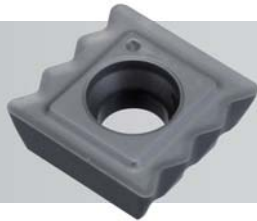
Port of hydraulic port for plug-in valve, cylinders, counter bore for bolt, and more!

Just one "NC Helix Drill" can machine different diameter and depth holes!

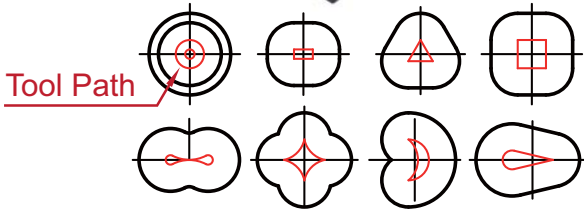
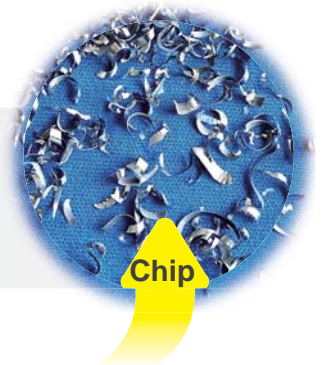




Special geometry insert to cut different materials



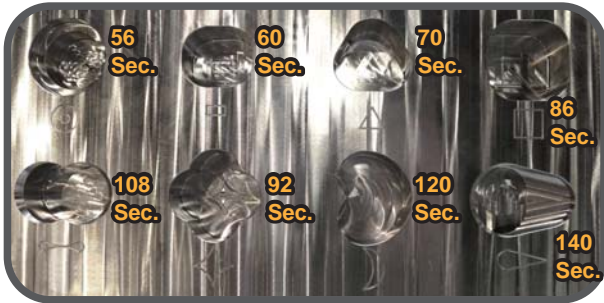
- ▶ Serrated cutting edge makes the cutting chips short and small, easier to be flushed out the drilled hole.
- ▶ For almost all kind of materials, good for soft and long cutting chip materials!



- Tool : 00-99323-016-2030 M08-HD17-2030
- Insert : N9MX070204-NC2032
- Machine : BT40, 22.5KW <Centre coolant>

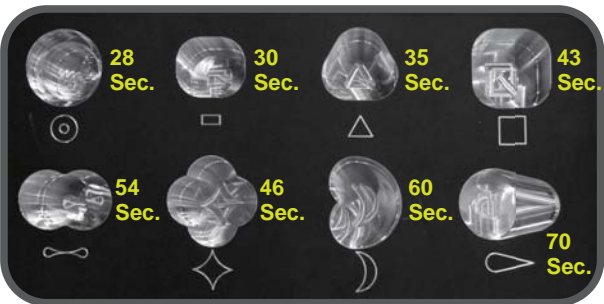
Material: SUS304 (Stainless steel 304)

Vc	Cutting Speed	=	150 m/min.
S	Spindle speed	=	2800 r.p.m.
f	Feed rate	=	0.1 mm/rev.
F	Table feed rate	=	280 mm/min.
L	Depth of Drilling	=	16 mm



Material: AL6061T6 (Aluminium 6061T6)

Vc	Cutting Speed	=	300 m/min.
S	Spindle speed	=	5600 r.p.m.
f	Feed rate	=	0.1 mm/rev.
F	Table feed rate	=	560 mm/min.
L	Depth of Drilling	=	16 mm



Material: Acrylic

Vc	Cutting Speed	=	300 m/min.
S	Spindle speed	=	5600 r.p.m.
f	Feed rate	=	0.1 mm/rev.
F	Table feed rate	=	560 mm/min.
L	Depth of Drilling	=	16 mm



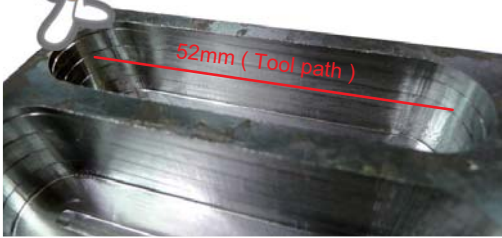
One tool performs multiple patterns

Not only a drill, but an end mill tool. Maximum ramping angle is 20°, small path radius to cut hole, counter-sink hole, various shape of cavity on different material. Less inventory of different sizes of drills and indexable end mills, **NC Helix Drill cuts it all !**





Replace your end mill by NC Helix Drill. Make the impossible become possible!



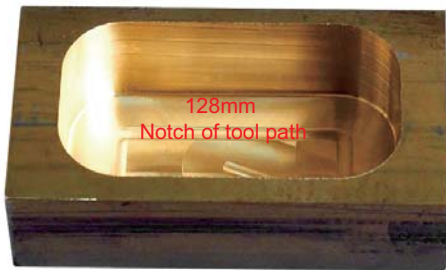
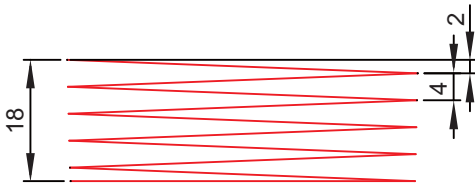
◀ Rough Slotting

- **Dimension: W:17mm x D:18mm x L:70mm.**
- Work Material : S45C (JIS), Medium Carbon Steel
- Tool : 00-99323-016-2030 M08-HD17-2030
- Insert : N9MX070204-NC2032
- Machine : BT40 < Centre coolant, emulsion >

■ Cutting Data:

Dc mm	L mm	Vc m/min.	S r.p.m.	f mm/rev.	F mm/min.	P mm	T sec.	Q cm ³ /mm
Ø17	70	200	3800	0.1	380	4*	91	34

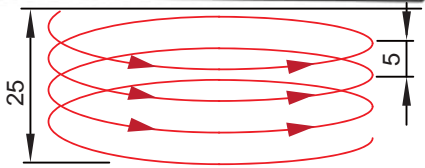
* Ramping depth per cut= 2 mm



- **Dimension: W:40mm x D:25mm x L:70mm.**
- Work Material : C95400, Aluminium Bronze
- Tool : 00-99323-020-2540 M10-HD22-2540
- Insert : N9MX100306-NC2032
- Machine : HAAS BT40 < External / Centre coolant >

■ Cutting Data:

Dc mm	L mm	Vc m/min.	S r.p.m.	f mm/rev.	F mm/min.	P mm	T sec.	Q cm ³ /mm
Ø22	70	350	5000	0.2	1000	5	23	212

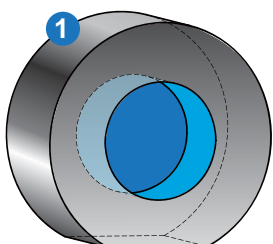


NC2032 insert grade is able to cut Titanium in different conditions

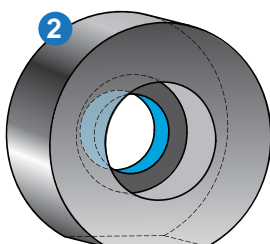


- Work Material : Ti6Al4V, Titanium
- Tool : 00-99323-016-2030 M08-HD17-2030
- Insert : N9MX070204-NC2032
- Machine : HAAS VM-3, BT40, 22.5KW

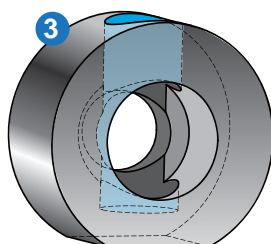
Fig.	Dc mm	D mm	L mm	Vc m/min.	S r.p.m.	f mm/rev.	F mm/min.	P mm	T sec.
1	Ø17	Ø30.5	20	60	1200	0.05	60	2	423
2		Ø20.5	20	60	1200	0.03	36	1	366
3		Ø20	50	60	1200	0.03	36	1	785
5		Ø20	20	60	1200	0.05	60	2	94



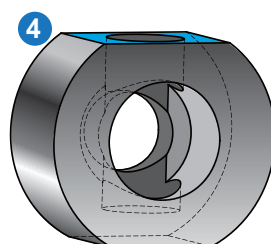
Counter sink
for M20 bolt



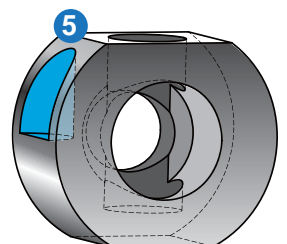
For M20
bolt hole



Cross hole



Surfacing



Half hole
on radius



Before you start, please pay attention the following conditions >>

- Tool path of moving downward by CCW (G03) direction is recommended.
- Reduce 25% cutting speed (Vc) for first trial.
- Reduce 25% cutting speed (Vc) if OAL is longer.
- Reduce 25% cutting speed (Vc) while applying on 4 axis and 5 axis machine or the clamping is unstable.
- Reduce 30% pitch if chip evacuations is concerned. Afterward, it can increase to get higher efficiency.
- For external coolant supply, lower pressure higher volume is recommended. Keep coolant fulfill inside the hole.

■ 00-99321-010-1320 ■ 00-99323-010-1320

Drilling dia. Work piece material		Vc m/min.		Ø13		Ø14		Ø16		Ø18		Ø20	
		00-99321	00-99323	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm
P	Carbon steel 0.25%C	132	220	0.070	1.00	0.100	1.250	0.140	1.50	0.180	1.750	0.200	2.00
	Carbon steel 0.45% C	120	200	0.070	1.00	0.100	1.250	0.140	1.50	0.180	1.750	0.200	2.00
	Carbon steel 0.60%C	108	180	0.063	0.90	0.090	1.125	0.126	1.35	0.162	1.575	0.180	1.80
	Low alloy steel	96	160	0.056	0.80	0.080	1.000	0.112	1.20	0.144	1.400	0.160	1.60
	High alloy steel	72	120	0.056	0.80	0.080	1.000	0.112	1.20	0.144	1.400	0.160	1.60
M	Stainless steel	72	120	0.056	0.80	0.080	1.000	0.112	1.20	0.144	1.400	0.160	1.60
K	Cast Iron	96	160	0.070	1.00	0.100	1.250	0.140	1.50	0.180	1.750	0.200	2.00
N	Al	180	300	0.070	1.50	0.100	1.875	0.140	2.25	0.180	2.625	0.200	3.00
	Cu	144	240	0.070	1.20	0.100	1.500	0.140	1.80	0.180	2.100	0.200	2.40
S	Ni- Alloy	24	40	0.028	0.80	0.040	1.000	0.056	1.20	0.072	1.400	0.080	1.60
	Titanium	48	80	0.028	0.80	0.040	1.000	0.056	1.20	0.072	1.400	0.080	1.60

■ 00-99321-012-1525 ■ 00-99323-012-1525

Drilling dia. Work piece material		Vc m/min.		Ø15		Ø17		Ø20		Ø22		Ø25	
		00-99321	00-99323	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm
P	Carbon steel 0.25%C	132	220	0.090	2.00	0.130	2.250	0.160	2.50	0.200	2.75	0.220	3.00
	Carbon steel 0.45% C	120	200	0.090	2.00	0.130	2.250	0.160	2.50	0.200	2.75	0.220	3.00
	Carbon steel 0.60%C	108	180	0.081	1.80	0.117	2.025	0.144	2.25	0.180	2.475	0.198	2.70
	Low alloy steel	96	160	0.072	1.60	0.104	1.800	0.128	2.00	0.160	2.200	0.176	2.40
	High alloy steel	72	120	0.072	1.60	0.104	1.800	0.128	2.00	0.160	2.200	0.176	2.40
M	Stainless steel	72	120	0.072	1.60	0.104	1.800	0.128	2.00	0.160	2.200	0.176	2.40
K	Cast Iron	96	160	0.090	2.00	0.130	2.250	0.160	2.50	0.200	2.750	0.220	3.00
N	Al	180	300	0.090	3.00	0.130	3.375	0.160	3.75	0.200	4.125	0.220	4.50
	Cu	144	240	0.090	2.40	0.130	2.700	0.160	3.00	0.200	3.300	0.220	3.60
S	Ni- Alloy	24	40	0.036	1.60	0.052	1.800	0.064	2.00	0.080	2.200	0.088	2.40
	Titanium	48	80	0.036	1.60	0.052	1.800	0.064	2.00	0.080	2.200	0.088	2.40

■ 00-99321-016-2030 ■ 00-99323-016-2030

Drilling dia. Work piece material		Vc m/min.		Ø20		Ø22		Ø25		Ø27		Ø30	
		00-99321	00-99323	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm
P	Carbon steel 0.25%C	132	220	0.100	3.00	0.150	3.25	0.200	3.50	0.240	3.750	0.260	4.00
	Carbon steel 0.45% C	120	200	0.100	3.00	0.150	3.25	0.200	3.50	0.240	3.750	0.260	4.00
	Carbon steel 0.60%C	108	180	0.090	2.70	0.135	2.925	0.180	3.15	0.216	3.375	0.234	3.60
	Low alloy steel	96	160	0.080	2.40	0.120	2.600	0.160	2.80	0.192	3.000	0.208	3.20
	High alloy steel	72	120	0.080	2.40	0.120	2.600	0.160	2.80	0.192	3.000	0.208	3.20
M	Stainless steel	72	120	0.080	2.40	0.120	2.600	0.160	2.80	0.192	3.000	0.208	3.20
K	Cast Iron	96	160	0.100	3.00	0.150	3.250	0.200	3.50	0.240	3.750	0.260	4.00
N	Al	180	300	0.100	4.50	0.150	4.875	0.200	5.25	0.240	5.625	0.260	6.00
	Cu	144	240	0.100	3.60	0.150	3.900	0.200	4.20	0.240	4.500	0.260	4.80
S	Ni- Alloy	24	40	0.040	2.40	0.060	2.600	0.080	2.80	0.096	3.000	0.104	3.20
	Titanium	48	80	0.040	2.40	0.060	2.600	0.080	2.80	0.096	3.000	0.104	3.20



Before you start, please pay attention the following conditions >>

- Tool path of moving downward by CCW (G03) direction is recommended.
- Reduce 25% cutting speed (Vc) for first trial.
- Reduce 25% cutting speed (Vc) if OAL is longer.
- Reduce 25% cutting speed (Vc) while applying on 4 axis and 5 axis machine or the clamping is unstable.
- Reduce 30% pitch if chip evacuations is concerned. Afterward, it can increase to get higher efficiency.
- For external coolant supply, lower pressure higher volume is recommended. Keep coolant fulfill inside the hole.

■ 00-99321-020-2540 ■ 00-99323-020-2540

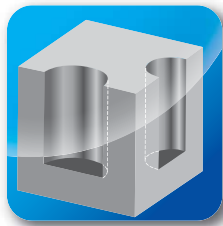
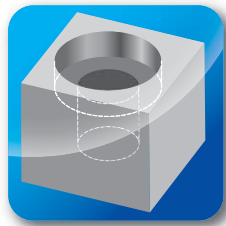
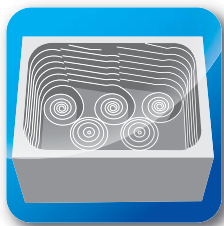
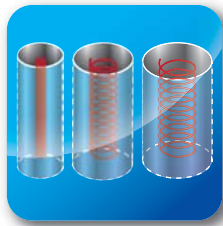
Work piece material	Drilling dia.	Vc m/min.		Ø25		Ø28		Ø32		Ø36		Ø40	
		00-99321	00-99323	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm
P	Carbon steel 0.25%C	132	220	0.120	3.00	0.170	3.50	0.230	4.00	0.280	4.50	0.30	5.00
	Carbon steel 0.45% C	120	200	0.120	3.00	0.170	3.50	0.230	4.00	0.280	4.50	0.30	5.00
	Carbon steel 0.60%C	108	180	0.108	2.70	0.153	3.15	0.207	3.60	0.252	4.05	0.27	4.50
	Low alloy steel	96	160	0.096	2.40	0.136	2.80	0.184	3.20	0.224	3.60	0.24	4.00
	High alloy steel	72	120	0.096	2.40	0.136	2.80	0.184	3.20	0.224	3.60	0.24	4.00
M	Stainless steel	72	120	0.096	2.40	0.136	2.80	0.184	3.20	0.224	3.60	0.24	4.00
K	Cast Iron	96	160	0.120	3.00	0.170	3.50	0.230	4.00	0.280	4.50	0.30	5.00
N	Al	180	300	0.120	4.50	0.170	5.25	0.230	6.00	0.280	6.75	0.30	7.50
	Cu	144	240	0.120	3.60	0.170	4.20	0.230	4.80	0.280	5.40	0.30	6.00
S	Ni- Alloy	24	40	0.048	2.40	0.068	2.80	0.092	3.20	0.112	3.60	0.12	4.00
	Titanium	48	80	0.048	2.40	0.068	2.80	0.092	3.20	0.112	3.60	0.12	4.00

■ 00-99321-025-3050 ■ 00-99323-025-3050

Work piece material	Drilling dia.	Vc m/min.		Ø30		Ø35		Ø40		Ø45		Ø50	
		00-99321	00-99323	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm
P	Carbon steel 0.25%C	132	220	0.130	4.00	0.200	4.50	0.280	5.00	0.320	5.50	0.340	6.00
	Carbon steel 0.45% C	120	200	0.130	4.00	0.200	4.50	0.280	5.00	0.320	5.50	0.340	6.00
	Carbon steel 0.60%C	108	180	0.117	3.60	0.180	4.05	0.252	4.50	0.288	4.95	0.306	5.40
	Low alloy steel	96	160	0.104	3.20	0.160	3.60	0.224	4.00	0.256	4.40	0.272	4.80
	High alloy steel	72	120	0.104	3.20	0.160	3.60	0.224	4.00	0.256	4.40	0.272	4.80
M	Stainless steel	72	120	0.104	3.20	0.160	3.60	0.224	4.00	0.256	4.40	0.272	4.80
K	Cast Iron	96	160	0.130	4.00	0.200	4.50	0.280	5.00	0.320	5.50	0.340	6.00
N	Al	180	300	0.130	6.00	0.200	6.75	0.280	7.50	0.320	8.25	0.340	9.00
	Cu	144	240	0.130	4.80	0.200	5.40	0.280	6.00	0.320	6.60	0.340	7.20
S	Ni- Alloy	24	40	0.052	3.20	0.080	3.60	0.112	4.00	0.128	4.40	0.136	4.80
	Titanium	48	80	0.052	3.20	0.080	3.60	0.112	4.00	0.128	4.40	0.136	4.80

■ 00-99321-025-4265

Work piece material	Drilling dia.	Vc m/min.		Ø42		Ø50		Ø55		Ø60		Ø65	
		00-99321-025-4265		f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm	f mm/rev.	P mm
P	Carbon steel 0.25%C	220		0.200	5.00	0.240	5.25	0.30	5.50	0.320	5.75	0.340	6.00
	Carbon steel 0.45% C	200		0.200	5.00	0.240	5.25	0.30	5.50	0.320	5.75	0.340	6.00
	Carbon steel 0.60%C	180		0.180	4.50	0.216	4.72	0.27	4.95	0.288	5.17	0.306	5.40
	Low alloy steel	160		0.160	4.00	0.192	4.20	0.24	4.40	0.256	4.60	0.272	4.80
	High alloy steel	120		0.160	4.00	0.192	4.20	0.24	4.40	0.256	4.60	0.272	4.80
M	Stainless steel	120		0.160	4.00	0.192	4.20	0.24	4.40	0.256	4.60	0.272	4.80
K	Cast Iron	160		0.200	5.00	0.240	5.25	0.30	5.50	0.320	5.75	0.340	6.00
N	Al	300		0.200	7.50	0.240	7.87	0.30	8.25	0.320	8.62	0.340	9.00
	Cu	240		0.200	6.00	0.240	6.30	0.30	6.60	0.320	6.90	0.340	7.20
S	Ni- Alloy	40		0.080	4.00	0.096	4.20	0.12	4.40	0.128	4.60	0.136	4.80
	Titanium	80		0.080	4.00	0.096	4.20	0.12	4.40	0.128	4.60	0.136	4.80



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