

**Nine9**® *New*

## **3xD Super Drill**

3xD indexable drills from 10mm up to 30mm.

Tough and Nickel plated drill body.

4 cutting edges per insert, same insert for outer and inner insert.



## Main features:

- Smallest indexable drill from diameter 10 mm, 3xD.
- Dual-relief angle insert, maximum feed rate is possible.
- Unique design of the central and peripheral insert position, the cutting chips are divided into more pieces, making swarf excavation more efficient.
- The central insert and peripheral insert are identical, therefore insert costs are less and stock management is easier.
- Better surface finish, Better form accuracy.

*Patent Pending*



## Insert

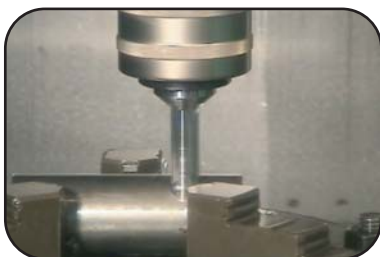
- K20F grade carbide insert, fully ground, multi-layer TiAlN coated, universal type for all kind of materials.
- Fine lapping on the cutting edge, good chip breaking condition.
- Patented Dual-relief angle insert:
  - Primary relief angle: 7 degree for increasing toughness of the cutting edge.
  - Secondary relief angle: 11 degree for increasing axial feed rate.
- Square insert with 4 cutting edges, Low cost!

## Insert position

- Thanks to the special arranged insert position, the cutting chips will be split into more pieces for optimized cutting chip removing flow.
- The cutting edge of the insert is nearly to perpendicular to the axial line, which makes the lateral cutting force minimized. It helps to reduce chattering even on unstable drilling conditions.

## Tough body

- The body is made by high alloy tool steel.
- The body is hardened and Nickel plated.
- Two drilled coolant holes help supply a large volume of coolant to flush out the swarf.



【 Cone 】

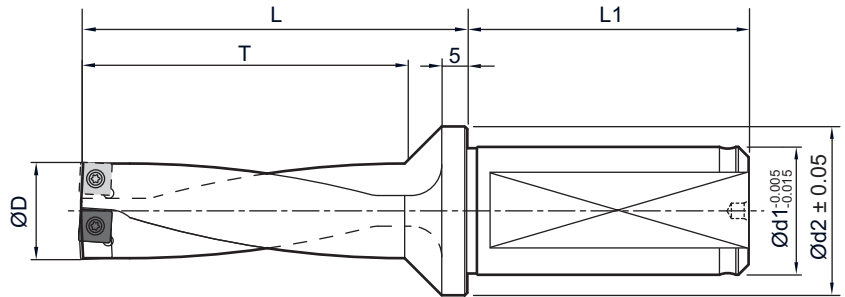


【 Half diameter 】



【 Plunge drilling 】

## Dimensions and ordering code

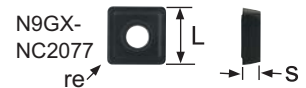
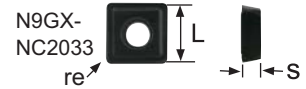


Ordering code	D	T	L	d1	d2	L1	Insert Screw / Key	Radial Adjustment	D max
00-99313-10.0	10.0	35.25	49	20	27	49	N9GX04T002 NS-18037 NK-T6 Torque: 0.4Nm	0.25	10.5
* 00-99313-10.3	10.3	38.5	52	20	27	49		0.25	10.8
00-99313-10.5	10.5	38.5	52	20	27	49		0.25	11.0
00-99313-11.0	11.0	38.75	52	20	27	49		0.20	11.4
00-99313-11.5	11.5	42.0	55	20	27	49		0.20	11.9
00-99313-12.0	12.0	42.25	55	20	27	49		0.15	12.3
00-99313-12.5	12.5	45.5	58	20	27	49		0.15	12.8
00-99313-13.0	13.0	45.75	58	20	27	49	N9GX05T103 NS-20045 NK-T6 Torque: 0.6Nm	0.30	13.6
00-99313-13.5	13.5	49.0	61	20	27	49		0.30	14.1
00-99313-14.0	14.0	49.25	61	20	27	49		0.25	14.5
00-99313-14.5	14.5	52.5	64	20	27	49		0.25	15.0
00-99313-15.0	15.0	52.75	64	20	27	49		0.20	15.4
00-99313-15.5	15.5	54.0	66	20	27	49		0.20	15.9
00-99313-16.0	16.0	54.25	66	25	33	55		N9GX060204 NS-22055 NK-T7 Torque: 0.9Nm	0.40
00-99313-16.5	16.5	55.5	69	25	33	55	0.40		17.3
00-99313-17.0	17.0	55.75	69	25	33	55	0.35		17.7
00-99313-17.5	17.5	59.0	72	25	33	55	0.35		18.2
00-99313-18.0	18.0	59.25	72	25	33	55	0.30		18.6
00-99313-18.5	18.5	63.5	76	25	33	55	0.30		19.1
00-99313-19.0	19.0	63.75	76	25	33	55	0.25		19.5
00-99313-19.5	19.5	69.0	81	25	33	55	0.25	20.0	
00-99313-20.0	20.0	69.25	81	25	33	55	N9GX070304 NS-25060 NK-T7 Torque: 1.2Nm	0.50	21.0
00-99313-20.5	20.5	72.5	84	25	33	55		0.50	21.5
00-99313-21.0	21.0	72.75	84	25	33	55		0.45	21.9
00-99313-21.5	21.5	76.0	87	25	33	55		0.45	22.4
00-99313-22.0	22.0	76.25	87	25	33	55		0.40	22.8
00-99313-22.5	22.5	80.5	91	25	33	55		0.40	23.3
00-99313-23.0	23.0	80.75	91	25	33	55		0.35	23.7
00-99313-23.5	23.5	85.0	95	25	33	55	0.35	24.2	
00-99313-24.0	24.0	85.25	95	25	33	55	0.30	24.6	
00-99313-25.0	25.0	75.0	99	32	43	58	N9GX090308 NS-30072 NK-T9 Torque: 2.0Nm	0.50	26.0
00-99313-26.0	26.0	78.0	102	32	43	58		0.40	27.0
00-99313-27.0	27.0	81.0	105	32	43	58		0.40	27.8
00-99313-28.0	28.0	84.0	109	32	43	58		0.30	28.8
00-99313-29.0	29.0	87.0	112	32	43	58		0.30	29.6
00-99313-30.0	30.0	90.0	117	32	43	58		0.30	30.6

\* Prebored to Tapping M12 x P1.25.

## Features of the insert

- Patented Dual-relief angle insert.
- Square insert, 4 cutting edges, low cost.
- Fine lapping on the cutting edge, good chip breaking condition.
- Fully ground carbide insert, multi-layer TiAlN coated.
  - **Grade NC2033:** K20F grade, TiAlN coated, higher hardness, good for high carbon steel, high alloy steel, hardened steel and casting iron.
  - **Grade NC2077:** P35 grade, TiAlN coated, tough and sharp cutting edge, for long cutting chip material, such as low carbon steel, low carbon alloy steel, stainless steel and non-ferrous metal.



Ordering code			Dimensions			Insert Screw	Screw Key
Code of insert	Grade		L	S	re	Ordering code	Ordering code
01-N9GX04T002	NC2033	NC2077	4.0	1.8	0.2	00-NS-18037	00-NK-T6
01-N9GX05T103	NC2033	NC2077	5.0	2.0	0.2	00-NS-20045	00-NK-T6
01-N9GX060204	NC2033	NC2077	6.35	2.38	0.4	00-NS-22055	00-NK-T7
01-N9GX070304	NC2033	NC2077	7.94	3.18	0.4	00-NS-25060	00-NK-T7
01-N9GX090308	NC2033	NC2077	9.52	3.18	0.8	00-NS-30072	00-NK-T9

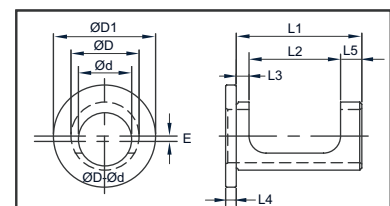
## Cutting Data

- Coolant must be supplied through the centre coolant hole.
- Do not use pecking drilling cycle even when drilling on an unstable surface.
- The middle value of each recommended cutting data are the initial choice for the regular condition.
- The feed rate must be well selected for optimized shape of cutting chip. Please see the cutting chip chart on next page to have the direction of choosing the best cutting data.
- The maximum misalignment of the drill center is +0.2 mm/-0.5 mm on the CNC lathe.

Work piece material	Grade of insert	Cutting Speed Vc m/min.	Feed rate mm/rev.				
			N9GX04T002 Dia. 10~12.5	N9GX05T103 Dia. 13~15.5	N9GX060204 Dia. 16~19.5	N9GX070304 Dia. 20~24	N9GX090308 Dia. 25~30
Carbon steel C<0.3%	NC2077	120-180-240	0.04-0.05-0.06	0.06-0.07-0.08	0.10-0.11-0.12	0.10-0.12-0.14	0.10-0.13-0.15
Carbon steel C>0.3%	NC2033	150-225-300	0.06-0.07-0.08	0.08-0.09-0.10	0.10-0.11-0.12	0.10-0.13-0.15	0.10-0.13-0.15
Low alloy steel C<0.3%	NC2077	120-180-240	0.04-0.05-0.06	0.06-0.07-0.08	0.08-0.09-0.10	0.10-0.11-0.12	0.10-0.11-0.12
High alloy steel & C>0.3%	NC2033	80-115-150	0.04-0.05-0.06	0.06-0.07-0.08	0.08-0.09-0.10	0.10-0.11-0.12	0.10-0.11-0.12
Hardened steel <HRC 50°	NC2033	80-90-100	0.04-0.05-0.06	0.06-0.07-0.08	0.06-0.07-0.08	0.08-0.09-0.10	0.08-0.09-0.10
Stainless steel	NC2077	100-125-150	0.04-0.05-0.06	0.06-0.07-0.08	0.08-0.09-0.10	0.10-0.11-0.12	0.10-0.11-0.12
Casting Iron	NC2033	80-90-100	0.06-0.07-0.08	0.08-0.09-0.10	0.10-0.11-0.12	0.08-0.09-0.10	0.08-0.09-0.10

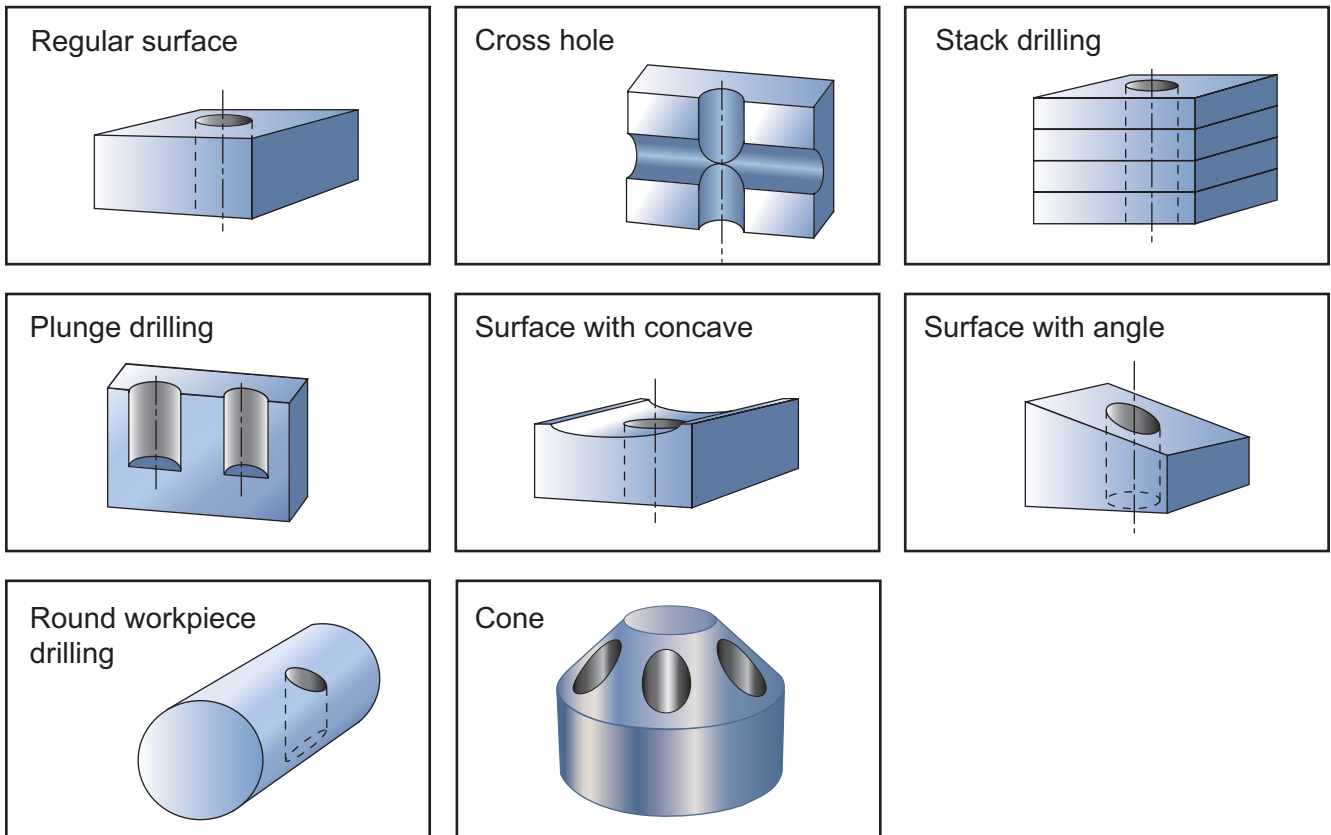
## Eccentric Ring

- Eccentric adjustable range E= ± 0.2 mm.



Ordering code	Part No.	ØD	Ød	ØD1	L1	L2	L3	L4	L5
00-99302-2520	LS25-ID20	25	20	41	43	33	3	4	7
00-99302-3225	LS32-ID25	32	25	48	59	41	6	5	12
00-99302-4032	LS40-ID32	40	32	58	69	43	6	5	20

## Application of drill in different conditions



## Adjustment on CNC Lathe

### Centre height on the lathe:

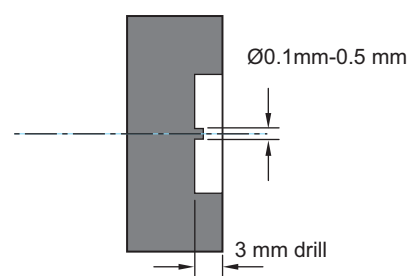
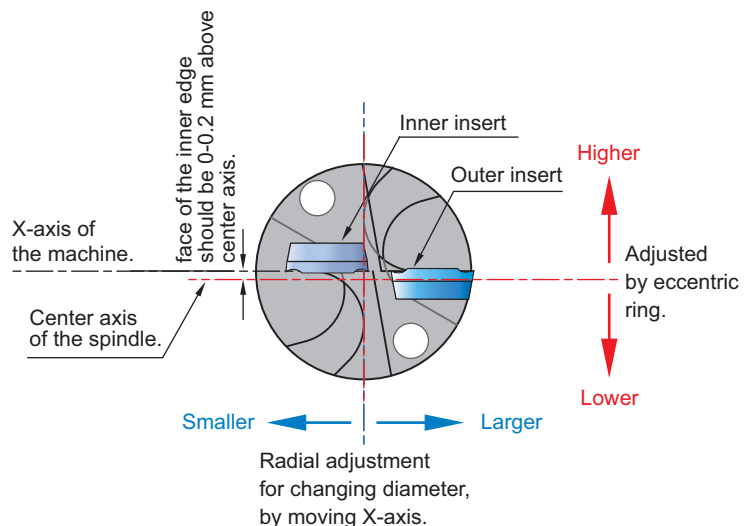
- The face of the inner edge must be 0-0.2 mm over the centre.
- The height of the inner edge can be adjusted by eccentric ring.

### Diameter of the drill:

- The diameter of the drilled hole can be adjusted along X-axis of the lathe. The maximum radial adjustment is shown on the specification of the product.

### Check the centre height of the inner insert:

- Drill 3 mm depth and check that there is a small pip at the centre of the bottom of the hole. The pip should be between 0.1mm and 0.5mm in diameter.
- If there is no pip; the inner insert must be adjusted to be over the centre.
- If the pip is larger than 0.5mm diameter; the centre of the drill should be adjusted lower.



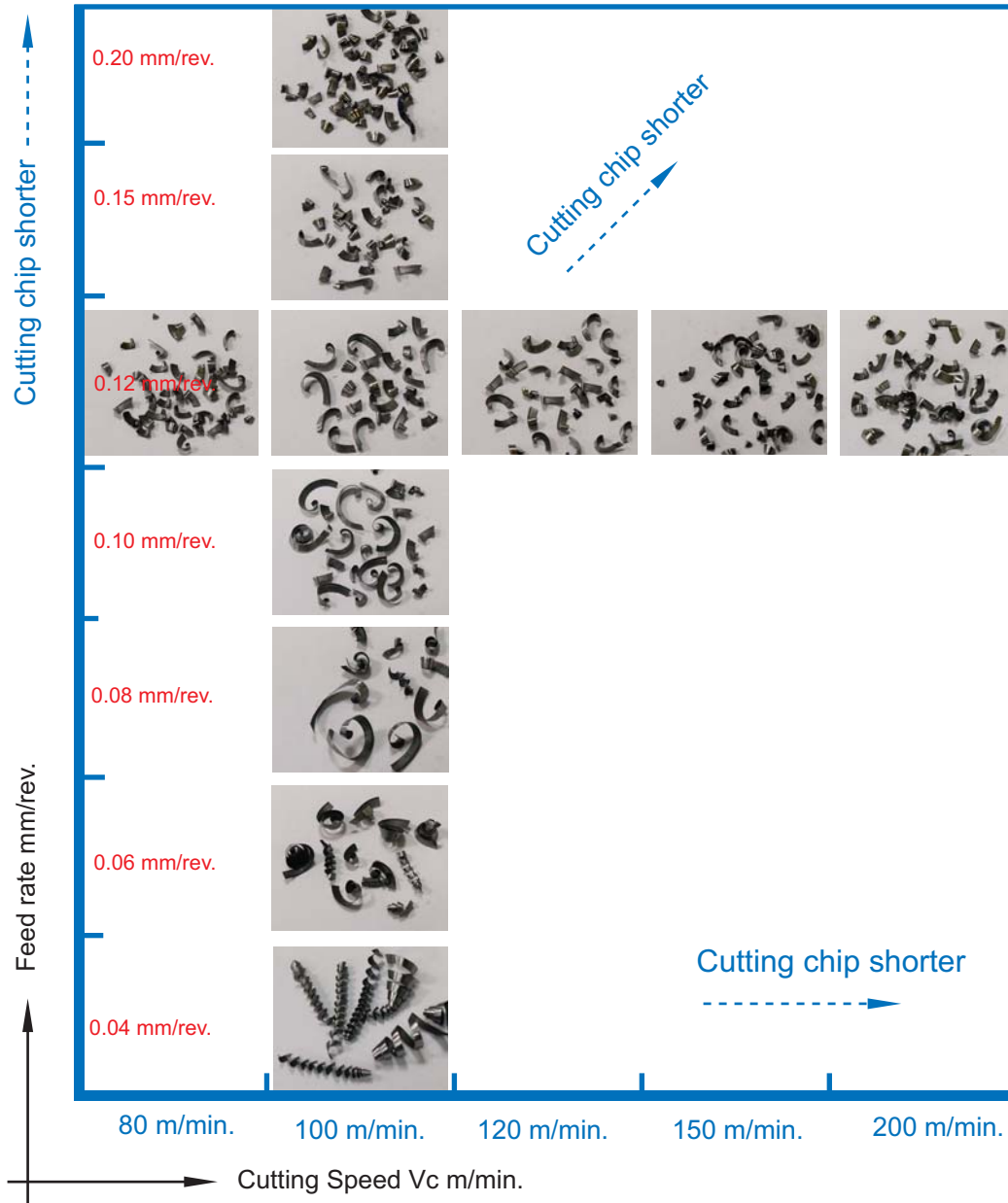


# 3xD Super Drills

Diameter range: 10mm ~ 30mm

## Cutting chip chart of Power Drill 99313

- You may judge the shape of the cutting chip to optimize cutting speed and feed rate and tool life.
- The higher cutting speed may create short chip, but the tool life will be shorter. The higher feed rate also creates shorter chip, but the insert will be broken.
- The best cutting condition should be made by optimized the cutting speed and feed rate. This chart is for operation to get the hints how to choose the next test cutting data, until the best condition made.



**Jimmore International Corp.**

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