



真好鑽

Ø10 ~ Ø30

- 最小尺寸可達10mm
- 刀片有4個切削刃口，內刃外刃共用同一款刀片

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真好鑽

尺寸範圍

3xD : Ø10 – Ø30 mm.

4xD : Ø16 – Ø30 mm.

最小切屑

- 內刃、外刃分割切屑，切屑細分後，切削快速，排屑容易
- 高速切削，一定使用切削液

切削表面優異，尺寸安定

- 內外切削力平衡，加工表面優異，尺寸穩定



3xD & 4xD



刀片有4個切削刃口
ALTiN鍍層

刀片與SPD外刃共用，刀片更換容易



≈ 切削底面平整



斜面可加工

不用預加工平面，就可直接鑽孔

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真好鑽



Coolant 冷却

鑽孔一定要有冷却液，
鑽孔深度1xD以內可用外部給水

外部冷却給水時，要直接給水在鑽頭頭部區域

刀片規範

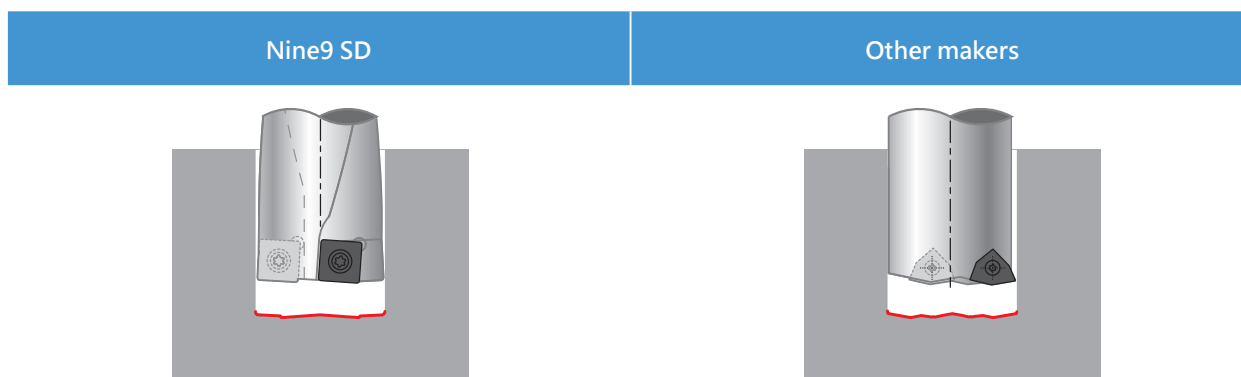
刀片

特性

- 双角度刀片，加工表面優異，進給率高
- 双角度刀片，主離隙角更耐衝擊，第二離隙角可提高進給率
- 內刃、外刃同一款刀片
- 刀片有4個切削刃口，更經濟
- 加工表面優異
- 加工尺寸穩定



NC2032



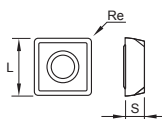
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真好鑽

▶ 刀片 >>

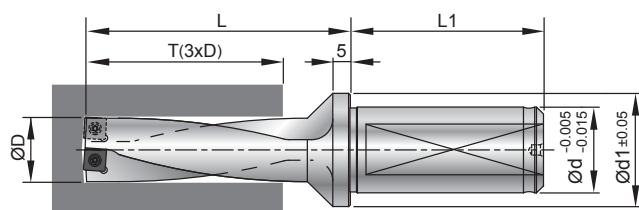
NC2032: K20F底材，ALTiN鍍層，泛用於鋼鐵，鑄鐵，不鏽鋼，硬化鋼 < HRC50

| Part No. | 鍍層 | 材質 | 尺寸 | | | 螺絲 | 扳手 | |
|------------|--------|-------|------|------|------|-----|--------------------|-------|
| | | | L | S | re | | | |
| N9GX04T002 | NC2032 | ALTiN | K20F | 4.07 | 1.8 | 0.2 | *NS-18037 0.6Nm | NK-T6 |
| N9GX05T103 | NC2032 | ALTiN | K20F | 5.07 | 2.0 | 0.3 | *NS-20045 0.6Nm | NK-T6 |
| N9GX060204 | NC2032 | ALTiN | K20F | 6.35 | 2.38 | 0.4 | *NS-22055 0.9Nm | NK-T7 |
| N9GX070304 | NC2032 | ALTiN | K20F | 7.94 | 3.18 | 0.4 | *NS-25060 0.9Nm | NK-T7 |
| N9GX090308 | NC2032 | ALTiN | K20F | 9.52 | 3.18 | 0.8 | NS-30072 2.0Nm | NK-T9 |



*建議使用扭力起子，參考6-22頁

刀桿 3xD 10mm ~ 30mm



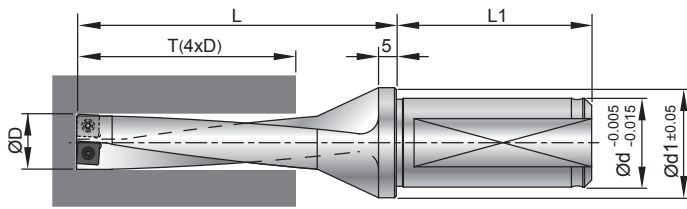
| Order No. | ØD | T | L | d | d1 | L1 | 刀片 螺絲 / 扳手 | Radial Adjustment | D max |
|------------|------|------|-----|----|----|----|--------------------|----------------------|-------|
| 99313-10 | 10.0 | 30.0 | 49 | 20 | 27 | 49 | | 0.25 | 10.5 |
| 99313-10.3 | 10.3 | 30.9 | 52 | 20 | 27 | 49 | | 0.25 | 10.8 |
| 99313-10.5 | 10.5 | 31.5 | 52 | 20 | 27 | 49 | N9GX04T002 | 0.25 | 11.0 |
| 99313-11 | 11.0 | 33.0 | 52 | 20 | 27 | 49 | *NS-18037 0.6Nm | 0.20 | 11.4 |
| 99313-11.5 | 11.5 | 34.5 | 55 | 20 | 27 | 49 | NK-T6 | 0.20 | 11.9 |
| 99313-12 | 12.0 | 36.0 | 55 | 20 | 27 | 49 | | 0.15 | 12.3 |
| 99313-12.5 | 12.5 | 37.5 | 58 | 20 | 27 | 49 | | 0.15 | 12.8 |
| 99313-13 | 13.0 | 39.0 | 58 | 20 | 27 | 49 | | 0.30 | 13.6 |
| 99313-13.5 | 13.5 | 40.5 | 61 | 20 | 27 | 49 | N9GX05T103 | 0.30 | 14.1 |
| 99313-14 | 14.0 | 42.0 | 61 | 20 | 27 | 49 | | 0.25 | 14.5 |
| 99313-14.5 | 14.5 | 43.5 | 64 | 20 | 27 | 49 | *NS-20045 0.6Nm | 0.25 | 15.0 |
| 99313-15 | 15.0 | 45.0 | 64 | 20 | 27 | 49 | NK-T6 | 0.20 | 15.4 |
| 99313-15.5 | 15.5 | 46.5 | 67 | 20 | 27 | 49 | | 0.20 | 15.9 |
| 99313-16 | 16.0 | 48.0 | 74 | 25 | 31 | 55 | | 0.40 | 16.8 |
| 99313-16.5 | 16.5 | 49.5 | 76 | 25 | 31 | 55 | | 0.40 | 17.3 |
| 99313-17 | 17.0 | 51.0 | 76 | 25 | 31 | 55 | | 0.35 | 17.7 |
| 99313-17.5 | 17.5 | 52.5 | 78 | 25 | 31 | 55 | N9GX060204 | 0.35 | 18.2 |
| 99313-18 | 18.0 | 54.0 | 78 | 25 | 31 | 55 | *NS-22055 0.9Nm | 0.30 | 18.6 |
| 99313-18.5 | 18.5 | 55.5 | 80 | 25 | 31 | 55 | NK-T7 | 0.30 | 19.1 |
| 99313-19 | 19.0 | 57.0 | 80 | 25 | 31 | 55 | | 0.25 | 19.5 |
| 99313-19.5 | 19.5 | 58.5 | 85 | 25 | 31 | 55 | | 0.25 | 20.0 |
| 99313-20 | 20.0 | 60.0 | 85 | 25 | 31 | 55 | | 0.50 | 21.0 |
| 99313-20.5 | 20.5 | 61.5 | 87 | 25 | 31 | 55 | | 0.50 | 21.5 |
| 99313-21 | 21.0 | 63.0 | 87 | 25 | 31 | 55 | N9GX070304 | 0.45 | 21.9 |
| 99313-21.5 | 21.5 | 64.5 | 88 | 25 | 31 | 55 | | 0.45 | 22.4 |
| 99313-22 | 22.0 | 66.0 | 88 | 25 | 31 | 55 | *NS-25060 0.9Nm | 0.40 | 22.8 |
| 99313-22.5 | 22.5 | 67.5 | 90 | 25 | 31 | 55 | NK-T7 | 0.40 | 23.3 |
| 99313-23 | 23.0 | 69.0 | 90 | 25 | 31 | 55 | | 0.35 | 23.7 |
| 99313-23.5 | 23.5 | 70.5 | 92 | 25 | 31 | 55 | | 0.35 | 24.2 |
| 99313-24 | 24.0 | 72.0 | 92 | 25 | 31 | 55 | | 0.30 | 24.6 |
| 99313-25 | 25.0 | 75.0 | 114 | 32 | 43 | 58 | | 0.50 | 26.0 |
| 99313-26 | 26.0 | 78.0 | 115 | 32 | 43 | 58 | N9GX090308 | 0.50 | 27.0 |
| 99313-27 | 27.0 | 81.0 | 117 | 32 | 43 | 58 | | 0.40 | 27.8 |
| 99313-28 | 28.0 | 84.0 | 126 | 32 | 43 | 58 | *NS-30072 2.0Nm | 0.40 | 28.8 |
| 99313-29 | 29.0 | 87.0 | 127 | 32 | 43 | 58 | NK-T9 | 0.30 | 29.6 |
| 99313-30 | 30.0 | 90.0 | 130 | 32 | 43 | 58 | | 0.30 | 30.6 |

*建議使用扭力起子，參考6-22頁

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真好鑽

刀桿 4xD 16mm ~ 30mm



| Order No. | ØD | T | L | Ød | Ød1 | L1 | 刀片 螺絲 / 扳手 | Radial Adjustment | D max |
|-----------|----|-----|-----|----|-----|----|---------------------------------------------|---------------------------------------------|-------|
| 99314-16 | 16 | 64 | 90 | 25 | 31 | 55 | ☐ N9GX060204 *NS-22055 0.9Nm NK-T7 | 0.40 | 16.8 |
| 99314-17 | 17 | 68 | 93 | 25 | 31 | 55 | | 0.35 | 17.7 |
| 99314-18 | 18 | 72 | 96 | 25 | 31 | 55 | | 0.30 | 18.6 |
| 99314-19 | 19 | 76 | 99 | 25 | 31 | 55 | | 0.25 | 19.5 |
| 99314-20 | 20 | 80 | 105 | 25 | 31 | 55 | | ☐ N9GX070304 *NS-25060 0.9Nm NK-T7 | 0.50 |
| 99314-21 | 21 | 84 | 108 | 25 | 31 | 55 | 0.45 | | 21.9 |
| 99314-22 | 22 | 88 | 110 | 25 | 31 | 55 | 0.40 | | 22.8 |
| 99314-23 | 23 | 92 | 113 | 25 | 31 | 55 | 0.35 | | 23.7 |
| 99314-24 | 24 | 96 | 116 | 25 | 31 | 55 | 0.30 | | 24.6 |
| 99314-25 | 25 | 100 | 139 | 32 | 43 | 58 | ☐ N9GX090308 NS-30072 2.0Nm NK-T9 | 0.50 | 26.0 |
| 99314-26 | 26 | 104 | 141 | 32 | 43 | 58 | | 0.50 | 27.0 |
| 99314-27 | 27 | 108 | 144 | 32 | 43 | 58 | | 0.40 | 27.8 |
| 99314-28 | 28 | 112 | 154 | 32 | 43 | 58 | | 0.40 | 28.8 |
| 99314-29 | 29 | 116 | 156 | 32 | 43 | 58 | | 0.30 | 29.6 |
| 99314-30 | 30 | 120 | 160 | 32 | 43 | 58 | | 0.30 | 30.6 |

*建議使用扭力起子，參考6-22頁

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加工應用

參數計算

| 應用狀態 | * 平坦表面 | 十字孔 | 堆疊鑽孔加工 | 圓形工件偏心鑽孔 |
|-----------------------|--------|------|---------|----------|
| 工件形狀 | | | | |
| 切削速度線速 Vc (m/min.) | 100% | 80% | 80%~70% | 80%~60% |
| 進給率 (mm/rev.) | 100% | 80% | 80%~70% | 80%~60% |
| 應用狀態 | 半邊孔 | 凹面加工 | 斜角面加工 | 圓錐體表面鑽孔 |
| 工件形狀 | | | | |
| 切削速度線速 Vc (m/min.) | 80% | 80% | 80%~70% | 80%~70% |
| 進給率 (mm/rev.) | 80% | 80% | 80%~70% | 80%~70% |

* SPD 不適用

切削資料

| 工件材質 | T= Length/ Dia. | Vc (m/min.) | f (mm/rev.) | | | | | Grade of insert |
|------------------------------|-----------------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|--------------------|
| | | | N9GX 04T002 | N9GX 05T103 | N9GX 060204 | N9GX 070304 | N9GX 090308 | |
| | | | Dia. 10~12.5 | Dia. 13~15.5 | Dia. 16~19.5 | Dia. 20~24 | Dia. 25~30 | |
| 低碳鋼 C<0.3% Ex.:S25C, SS41 | T=3D | 80~250 | 0.03~0.06 | 0.04~0.08 | 0.06~0.10 | 0.06~0.10 | 0.08~0.12 | NC2032 |
| | T=4D | 60~180 | — | — | 0.06~0.10 | 0.06~0.10 | 0.08~0.12 | |
| 中碳鋼 C>0.3% Ex.:S50C, P5 | T=3D | 80~300 | 0.04~0.08 | 0.06~0.10 | 0.06~0.12 | 0.08~0.12 | 0.08~0.15 | NC2032 |
| | T=4D | 60~150 | — | — | 0.06~0.12 | 0.08~0.12 | 0.08~0.15 | |
| 低合金鋼 C<0.3% Ex.:SCM415 | T=3D | 80~250 | 0.04~0.08 | 0.04~0.08 | 0.06~0.10 | 0.06~0.10 | 0.08~0.12 | NC2032 |
| | T=4D | 60~150 | — | — | 0.06~0.10 | 0.06~0.10 | 0.08~0.12 | |
| 低合金鋼 C>0.3% Ex.:SCM440 | T=3D | 80~250 | 0.04~0.08 | 0.04~0.10 | 0.06~0.12 | 0.06~0.12 | 0.08~0.15 | NC2032 |
| | T=4D | 60~150 | — | — | 0.06~0.12 | 0.06~0.12 | 0.08~0.15 | |
| 高合金鋼 Ex.:SKD11 | T=3D | 60~150 | 0.03~0.06 | 0.04~0.08 | 0.06~0.10 | 0.06~0.10 | 0.08~0.12 | NC2032 |
| | T=4D | 50~100 | — | — | 0.06~0.10 | 0.06~0.10 | 0.08~0.12 | |
| 鑄鋼 | T=3D | 80~180 | 0.03~0.06 | 0.04~0.08 | 0.06~0.10 | 0.06~0.10 | 0.08~0.12 | NC2032 |
| | T=4D | 60~120 | — | — | 0.06~0.10 | 0.06~0.10 | 0.08~0.12 | |
| 不鏽鋼 Ex.:SUS304 | T=3D | 60~150 | 0.03~0.06 | 0.04~0.08 | 0.04~0.10 | 0.06~0.10 | 0.06~0.12 | NC2032 |
| | T=4D | 50~100 | — | — | 0.04~0.10 | 0.06~0.10 | 0.06~0.12 | |
| 鑄鐵 Ex.:FC25 | T=3D | 80~120 | 0.04~0.08 | 0.06~0.08 | 0.06~0.08 | 0.06~0.10 | 0.08~0.12 | NC2032 |
| | T=4D | 60~100 | — | — | 0.06~0.08 | 0.06~0.10 | 0.08~0.12 | |
| 熱處理鋼 <HRC50° Ex.:SKD61 | T=3D | 60~100 | 0.03~0.06 | 0.04~0.08 | 0.05~0.08 | 0.06~0.08 | 0.06~0.10 | NC2032 |
| | T=4D | 40~80 | — | — | 0.05~0.08 | 0.06~0.08 | 0.06~0.10 | |

* 在CNC車床上，鑽頭中心的最大偏心值為+0.2 mm / -0.5 mm

| 公制 | | 英制 | |
|-------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------|
| $S = \frac{Vc \times 1000}{\pi \times d}$ | d = diameter -mm S = Spindle Speed -r.p.m. Vc = Cutting Speed -m/min. | $S = \frac{(3.82 \times SFM)}{d}$ | d = diameter-inch S = Spindle Speed-r.p.m. SFM = Surface Speed-ft./min. Vc (m/min.) x 3.28 |
| $F = S \times f$ | f = mm/rev. F = mm/min. | $F = f \times S$ | f = IPR = inch/rev. F = IPM=RPM x f / 25.4. |

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真好鑽