

專利號:
US 7,455,487 B2

-  Cycle Time
-  Roughness
-  Position Accuracy
-  True Roundness



高速搪刀

容易調整 / 高效率 / 低成本

間隙式搪刀和萬轉搪刀都是採用偏心原理，來作搪孔尺寸的微調，因此調整時，不會有背隙產生



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高速搪刀

萬轉搪刀

搪刀家族成員

99101: 0.03mm/div · 調整範圍±0.5mm · 尺寸範圍 \varnothing 6.5mm ~ \varnothing 25.5mm.

99121: 0.01mm/div · 調整範圍±0.1mm · 尺寸範圍 \varnothing 5mm ~ \varnothing 25mm

99146: 0.01mm/div · 調整範圍±0.12mm · 動平衡G6.3 10,000rpm

尺寸範圍 \varnothing 5mm ~ \varnothing 50mm · 尺寸可自行更換

99151: 深孔加工 · 可達4 ~ 6xD · 尺寸範圍 \varnothing 1mm ~ \varnothing 20mm



99101
99121



99146-BT30
99146-BT40
99146-BT50



99146-SB32



99151A-xxxW

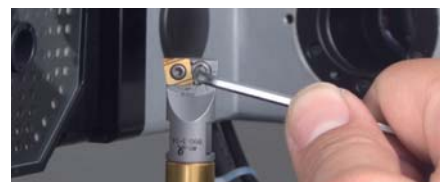


直接式精搪刀

本結構主要是利用刀片斜邊角度位置不同，產生直徑方向微量之尺寸變化，此結構應用於單尺寸搪刀，深孔搪刀，特殊搪刀...，可輕易控制 μ 之精度

99021 直接式微調刀桿

99043 鎖牙式微調刀頭



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高速搪刀

微調搪孔頭

容易調整

高精度容易調整

0.02mm/div · 游標刻劃 $2\mu\text{m}$



System

龍捲風萬轉搪刀

龍捲風萬轉搪刀

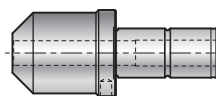
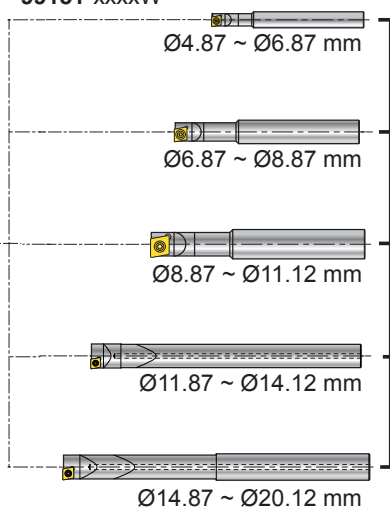
Solid Carbide Shank
99151-xxxxW

»»» page: 5-16

Ø4.87 ~ Ø20.12 mm



Insert
CC...03
CC...04
CC...06



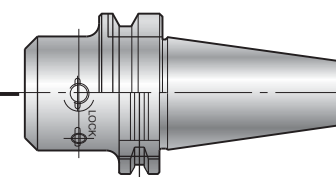
99151A-04...15.5
Adapter

»»» page: 5-16

Quick Change
Adjustment boring head shank

ANSI CAT40
DIN 69893 HSK63A
JIS 6339/MAS BT 30/40/50
SB32

Side lock Ø32mm



99146-xxxH

»»» page: 5-11

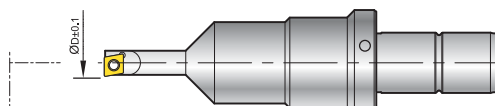
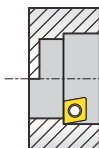
5

高速搪刀



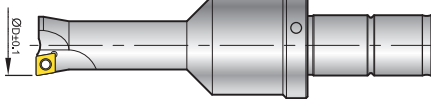
Insert
CC...03
CC...04
CC...06

Ø5 ~ Ø50 mm



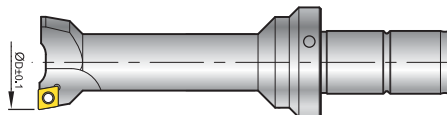
Ø5 ~ Ø10 mm
99146-xxS

»»» page: 5-12



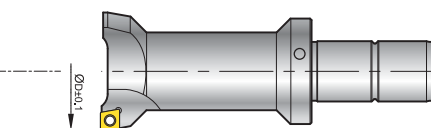
Ø11 ~ Ø25 mm
99146-xxS

»»» page: 5-12



Ø26 ~ Ø39 mm
99146-xxA

»»» page: 5-13



Ø40 ~ Ø50 mm
99146-xxA

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System

99101 / 99121 間隙式搪刀

刀片

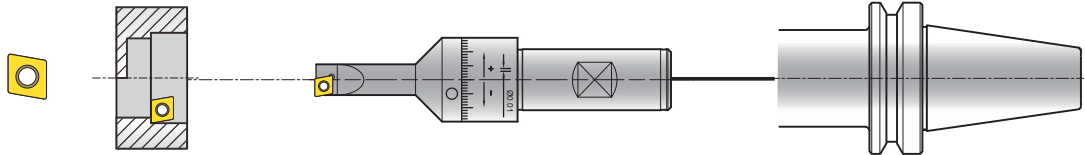
CC...03
CC...04
CC...06

Ø5 ~ Ø52 mm

99101-07...52
99121-05...52

»»» page: 5-9

側固刀桿
油壓刀桿
筒夾刀桿



99021 / 99043 直接式微調搪刀

刀片

CC...06
CC...09

Ø14 ~ Ø25 mm

直柄型

99021

»»» page: 5-21

油壓刀桿
筒夾刀桿



鎖牙型

99043-xx

»»» page: 5-22

延長桿

鋼柄 / 鎢鋼接桿

99801-xxS / 99801-xxW

»»» page: 5-22

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高速搪刀

99148 微調搪孔頭

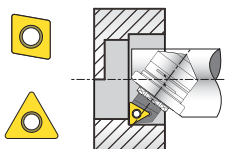
任何 ISO 刀片 Ø25.7 ~ Ø60.6 mm

CC..06

TC..09

TC..11

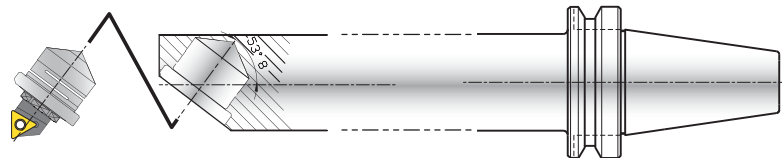
TC..16



Any available shank

微調搪孔頭
99148-xxxx

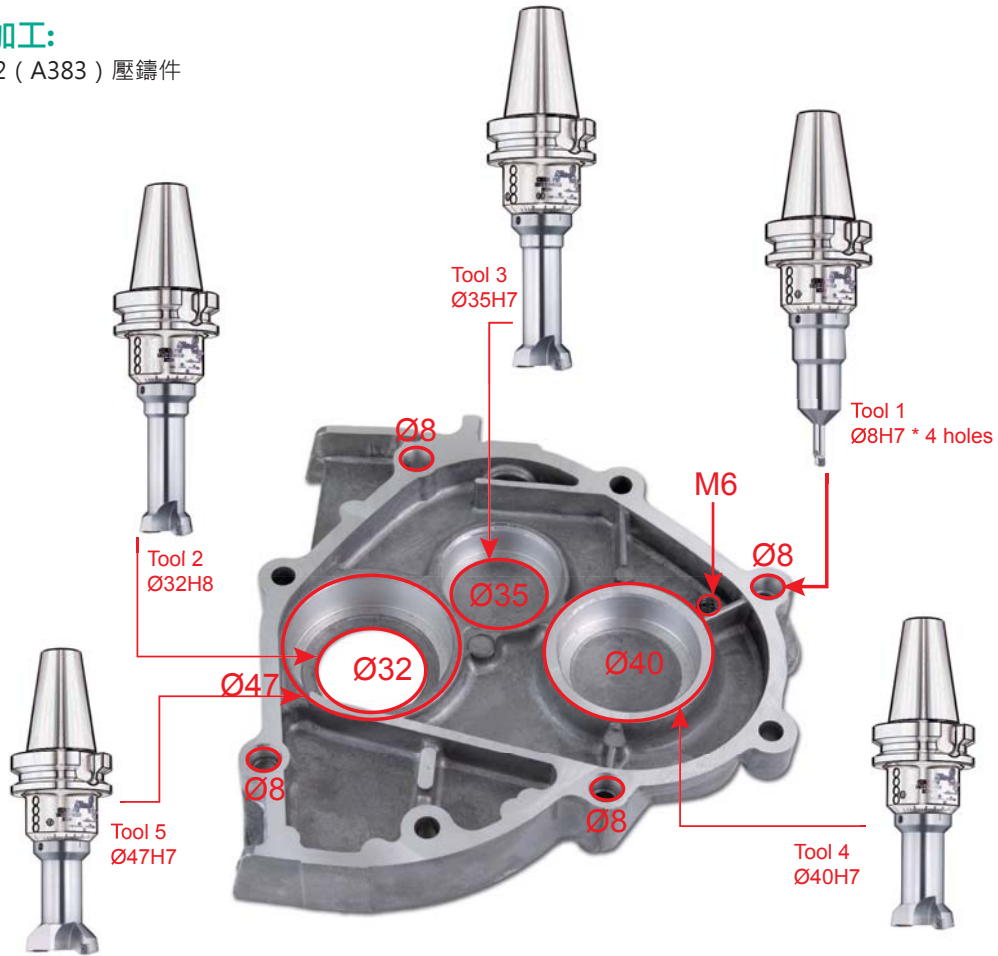
»»» page: 5-24



應用範例

機車引擎側蓋加工:

加工材料：ADC-12 (A383) 壓鑄件
機器主軸：BT40




TOOL LIST by Nine9 Boring Bar 99146-series :

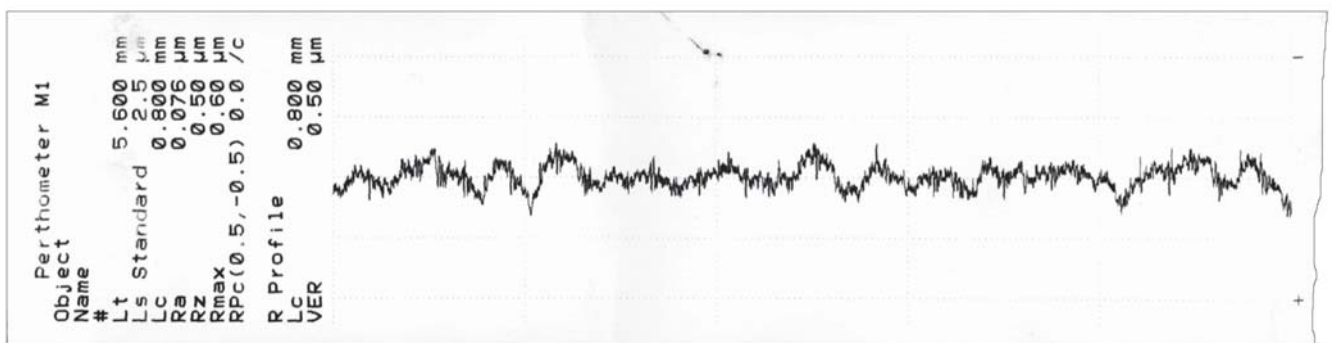
| No. | Boring Bar | Grade of insert | Dia. mm | Depth | r.p.m. | F = mm/min. | Machining time |
|-----|------------|---------------------|---------|-------|--------|-------------|----------------|
| 1 | 99146-08A | CCGT040102 NC30 | Ø8H7 | 8 mm | 8000 | 400 | 1.2 sec. |
| 2 | 99146-32A | CCGT060202HP NC9031 | Ø32H8 | 8 mm | 2985 | 209 | 2.3 sec. |
| 3 | 99146-35A | | Ø35H7 | 12 mm | 2730 | 191 | 3.8 sec. |
| 4 | 99146-40A | | Ø40H7 | 15 mm | 2400 | 168 | 5.4 sec. |
| 5 | 99146-47A | | Ø47H7 | 15 mm | 2030 | 142 | 6.4 sec. |

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高速搪刀

Working Example

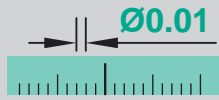
| | Material | Vc m/min. | f mm/rev. | Roughness | | | Tool holder | Insert |
|---|----------------|--------------|--------------|-----------|--------|-------|----------------|---------------------|
| | | | | Ra | Rz | Rmax | | |
|  | Al alloy, 6061 | 150 | 0.2 | 0.076µm | 0.50µm | 0.6µm | 99146-BT40-26A | CCGH0602U NC9096 |



99146龍捲風萬轉搪刀



尺寸範圍：
4.87mm ~ 50.12mm



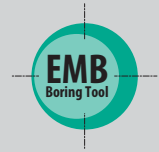
0.01mm/div
可在刀具設定儀
預先調尺寸



調整範圍
+0.12 / -0.13mm.



動平衡
G6.3 10000 r.p.m



尺寸調整時
不用消除背隙

容易操作

- 尺寸調整容易，可在刀具設定儀預先調尺寸或在切削中心機上直接調整
- 尺寸調整時，不用消除背隙
- 更換頭部快速，尺寸變換容易

低成本的小孔徑精搪刀

- 比其他精搪刀更經濟

搪刀頭部從5mm到50mm可更換

- 頭部尺寸齊全，更換快速，不影響動平衡

高轉速

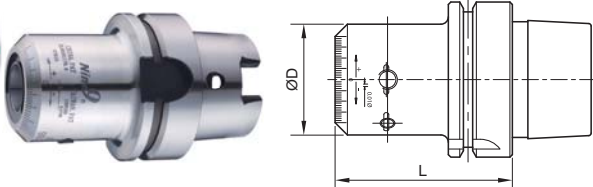
- 高轉速設計，動平衡G6.3 10,000rpm
- 刀片加工鋁合金700m/min
- 階級孔，加倒角，加平面特殊搪刀頭部可訂製

微調搪刀柄

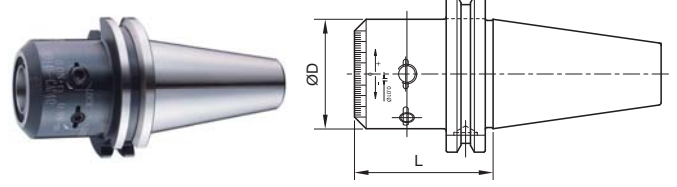
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高速搪刀

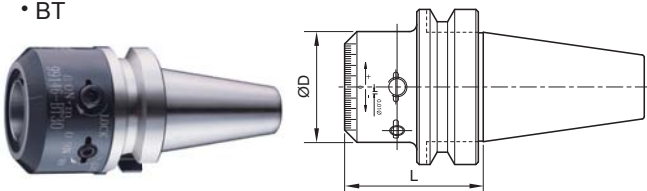
• HSK63



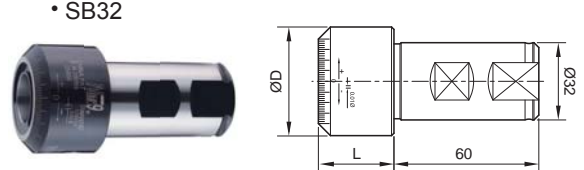
• CAT40



• BT



• SB32

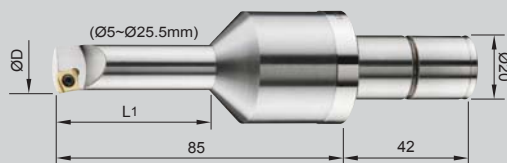


| Part No. | Type | ØD | L |
|---------------|---------------|----|------|
| 99146-HSK63AH | HSK63A-146-72 | 45 | 72 |
| 99146-CAT40H | CAT40-146-56 | 45 | 56.3 |
| 99146-BT30H | BT30-146-51 | 45 | 51.3 |
| 99146-BT40H | BT40-146-56 | 45 | 56.3 |
| 99146-BT50H | BT50-146-77 | 45 | 77.3 |
| 99146-SB32H | SB32-146-31 | 45 | 31.3 |

99146龍捲風萬轉搪刀

搪刀頭部 Ø5~Ø25

- 高合金鋼頭部
- 搪孔深度：L1, 2 ~ 3xD



- * 可依加工需求訂購中心出水型頭部。
- * 可訂製特殊規格。

ISO application



| Order No. | Part No. | ØD | L1 | 刀片/螺絲/扳手 | Order No. | Part No. | ØD | L1 | 刀片/螺絲/扳手 |
|-------------|--------------|-------------|-------|---|--------------|--------------|-------------|-------|---|
| 99146-0500S | C20-0500-10L | 4.87~5.12 | 10.00 | CC...030102 NS-16030* 0.4Nm / NK-T6 | 99146-1725S | C20-1725-42L | 17.12~17.37 | 42.50 | CC...060204 螺絲: NS-25045* 0.9Nm 扳手: NK-T7 |
| 99146-0600S | C20-0600-12L | 5.87~6.12 | 12.00 | | 99146-1750S | C20-1750-43L | 17.37~17.62 | 43.75 | |
| 99146-0700S | C20-0700-14L | 6.87~7.12 | 14.00 | | 99146-1775S | C20-1775-43L | 17.62~17.87 | 43.75 | |
| 99146-0800S | C20-0800-16L | 7.87~8.12 | 16.00 | | 99146-1800S | C20-1800-45L | 17.87~18.12 | 45.00 | |
| 99146-0900S | C20-0900-18L | 8.87~9.12 | 18.00 | | 99146-1825S | C20-1825-45L | 18.12~18.37 | 45.00 | |
| 99146-1000S | C20-1000-25L | 9.87~10.12 | 25.00 | | 99146-1850S | C20-1850-46L | 18.37~18.62 | 46.25 | |
| 99146-1025S | C20-1025-25L | 10.12~10.37 | 25.00 | | 99146-1875S | C20-1875-46L | 18.62~18.87 | 46.25 | |
| 99146-1050S | C20-1050-26L | 10.37~10.62 | 26.25 | | 99146-1900S | C20-1900-47L | 18.87~19.12 | 47.50 | |
| 99146-1075S | C20-1075-26L | 10.62~10.87 | 26.25 | | 99146-1925S | C20-1925-47L | 19.12~19.37 | 47.50 | |
| 99146-1100S | C20-1100-27L | 10.87~11.12 | 27.50 | | 99146-1950S | C20-1950-48L | 19.37~19.62 | 48.75 | |
| 99146-1125S | C20-1125-27L | 11.12~11.37 | 27.50 | | 99146-1975S | C20-1975-48L | 19.62~19.87 | 48.75 | |
| 99146-1150S | C20-1150-28L | 11.37~11.62 | 28.75 | | 99146-2000S | C20-2000-50L | 19.87~20.12 | 50.00 | |
| 99146-1175S | C20-1175-28L | 11.62~11.87 | 28.75 | | 99146-2025S | C20-2025-50L | 20.12~20.37 | 50.00 | |
| 99146-1200S | C20-1200-30L | 11.87~12.12 | 30.00 | | 99146-2050S | C20-2050-50L | 20.37~20.62 | 50.00 | |
| 99146-1225S | C20-1225-30L | 12.12~12.37 | 30.00 | | 99146-2075S | C20-2075-50L | 20.62~20.87 | 50.00 | |
| 99146-1250S | C20-1250-31L | 12.37~12.62 | 31.25 | | 99146-2100S | C20-2100-50L | 20.87~21.12 | 50.00 | |
| 99146-1275S | C20-1275-31L | 12.62~12.87 | 31.25 | | 99146-2125S | C20-2125-50L | 21.12~21.37 | 50.00 | |
| 99146-1300S | C20-1300-32L | 12.87~13.12 | 32.50 | 99146-2150S | C20-2150-50L | 21.37~21.62 | 50.00 | | |
| 99146-1325S | C20-1325-32L | 13.12~13.37 | 32.50 | 99146-2175S | C20-2175-50L | 21.62~21.87 | 50.00 | | |
| 99146-1350S | C20-1350-33L | 13.37~13.62 | 33.75 | 99146-2200S | C20-2200-50L | 21.87~22.12 | 50.00 | | |
| 99146-1375S | C20-1375-33L | 13.62~13.87 | 33.75 | 99146-2225S | C20-2225-50L | 22.12~22.37 | 50.00 | | |
| 99146-1400S | C20-1400-35L | 13.87~14.12 | 35.00 | 99146-2250S | C20-2250-50L | 22.37~22.62 | 50.00 | | |
| 99146-1425S | C20-1425-35L | 14.12~14.37 | 35.00 | 99146-2275S | C20-2275-50L | 22.62~22.87 | 50.00 | | |
| 99146-1450S | C20-1450-36L | 14.37~14.62 | 36.25 | 99146-2300S | C20-2300-50L | 22.87~23.12 | 50.00 | | |
| 99146-1475S | C20-1475-36L | 14.62~14.87 | 36.25 | 99146-2325S | C20-2325-50L | 23.12~23.37 | 50.00 | | |
| 99146-1500S | C20-1500-37L | 14.87~15.12 | 37.50 | 99146-2350S | C20-2350-50L | 23.37~23.62 | 50.00 | | |
| 99146-1525S | C20-1525-37L | 15.12~15.37 | 37.50 | 99146-2375S | C20-2375-50L | 23.62~23.87 | 50.00 | | |
| 99146-1550S | C20-1550-38L | 15.37~15.62 | 38.75 | 99146-2400S | C20-2400-50L | 23.87~24.12 | 50.00 | | |
| 99146-1575S | C20-1575-38L | 15.62~15.87 | 38.75 | 99146-2425S | C20-2425-50L | 24.12~24.37 | 50.00 | | |
| 99146-1600S | C20-1600-40L | 15.87~16.12 | 40.00 | 99146-2450S | C20-2450-50L | 24.37~24.62 | 50.00 | | |
| 99146-1625S | C20-1625-40L | 16.12~16.37 | 40.00 | 99146-2475S | C20-2475-50L | 24.62~24.87 | 50.00 | | |
| 99146-1650S | C20-1650-41L | 16.37~16.62 | 41.25 | 99146-2500S | C20-2500-50L | 24.87~25.12 | 50.00 | | |
| 99146-1675S | C20-1675-41L | 16.62~16.87 | 41.25 | 99146-2525S | C20-2525-50L | 25.12~25.37 | 50.00 | | |
| 99146-1700S | C20-1700-42L | 16.87~17.12 | 42.50 | 99146-2550S | C20-2550-50L | 25.37~25.62 | 50.00 | | |

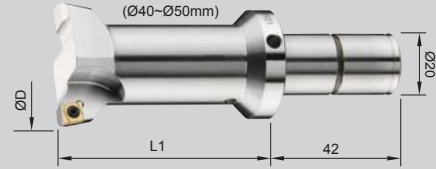
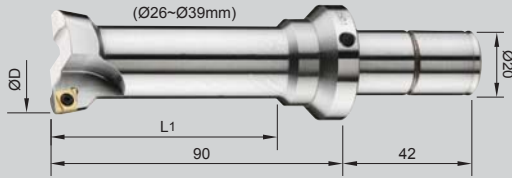
*建議使用扭力起子·參考6-22頁

5
高速搪刀

99146龍捲風萬轉搪刀

搪刀頭部 Ø26~Ø50

- 高合金鋼頭部
- 搪孔深度：L1, 2 ~ 3xD



Ø26~Ø39mm

* 可依加工需求訂購中心出水型頭部。

Ø40~Ø50mm

* 可依加工需求訂購中心出水型頭部。

| Order No. | Part No. | ØD | L1 | 刀片/螺絲/ 扳手 |
|-----------|--------------|-------------|-------|---|
| 99146-26A | C20-2600-50L | 25.87~26.12 | 50.00 | CC..060204 螺絲: NS-25060* 扳手: NK-T7 |
| 99146-27A | C20-2700-50L | 26.87~27.12 | 50.00 | |
| 99146-28A | C20-2800-50L | 27.87~28.12 | 50.00 | |
| 99146-29A | C20-2900-50L | 28.87~29.12 | 50.00 | |
| 99146-30A | C20-3000-50L | 29.87~30.12 | 50.00 | |
| 99146-31A | C20-3100-70L | 30.87~31.12 | 70.00 | |
| 99146-32A | C20-3200-70L | 31.87~32.12 | 70.00 | |
| 99146-33A | C20-3300-70L | 32.87~33.12 | 70.00 | |
| 99146-34A | C20-3400-70L | 33.87~34.12 | 70.00 | |
| 99146-35A | C20-3500-70L | 34.87~35.12 | 70.00 | |
| 99146-36A | C20-3600-70L | 35.87~36.12 | 70.00 | |
| 99146-37A | C20-3700-70L | 36.87~37.12 | 70.00 | |
| 99146-38A | C20-3800-70L | 37.87~38.12 | 70.00 | |
| 99146-39A | C20-3900-70L | 38.87~39.12 | 70.00 | |

| Order No. | Part No. | ØD | L1 | 刀片/螺絲/ 扳手 |
|-----------|--------------|-------------|-------|---|
| 99146-40A | C20-4000-70L | 39.87~40.12 | 70.00 | CC..060204 螺絲: NS-25060* 扳手: NK-T7 |
| 99146-41A | C20-4100-70L | 40.87~41.12 | 70.00 | |
| 99146-42A | C20-4200-70L | 41.87~42.12 | 70.00 | |
| 99146-43A | C20-4300-70L | 42.87~43.12 | 70.00 | |
| 99146-44A | C20-4400-70L | 43.87~44.12 | 70.00 | |
| 99146-45A | C20-4500-70L | 44.87~45.12 | 70.00 | |
| 99146-46A | C20-4600-70L | 45.87~46.12 | 70.00 | |
| 99146-47A | C20-4700-70L | 46.87~47.12 | 70.00 | |
| 99146-48A | C20-4800-70L | 47.87~48.12 | 70.00 | |
| 99146-49A | C20-4900-70L | 48.87~49.12 | 70.00 | |
| 99146-50A | C20-5000-70L | 49.87~50.12 | 70.00 | |

*建議使用扭力起子·參考6-22頁

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高速搪刀

套組

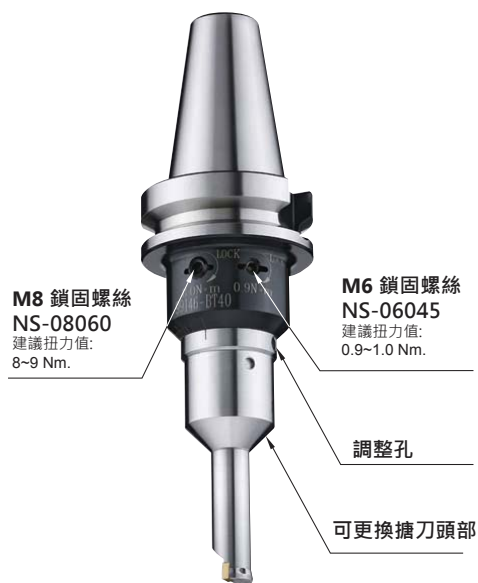
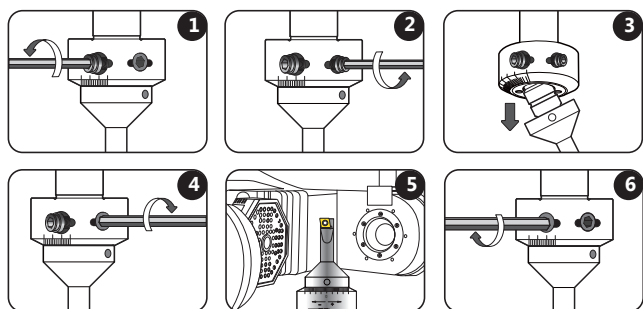
| Order No. | 內容 |
|--------------------|--------------|
| 99146-BT30-05SET | BT30H 微調搪刀柄 |
| 99146-BT40-05SET | BT40H 微調搪刀柄 |
| 99146-BT50-05SET | BT50H 微調搪刀柄 |
| 99146-CAT40-05SET | CAT40H 微調搪刀柄 |
| 99146-HSK63A-05SET | HSK63A 微調搪刀柄 |

微調搪刀柄: 1支
搪刀頭部: Ø5~Ø50 任何 5 支
配件: 3~5 支

• 注意: 套組不包含刀片·請分開訂購。

99146龍捲風萬轉搪刀 - 組裝流程

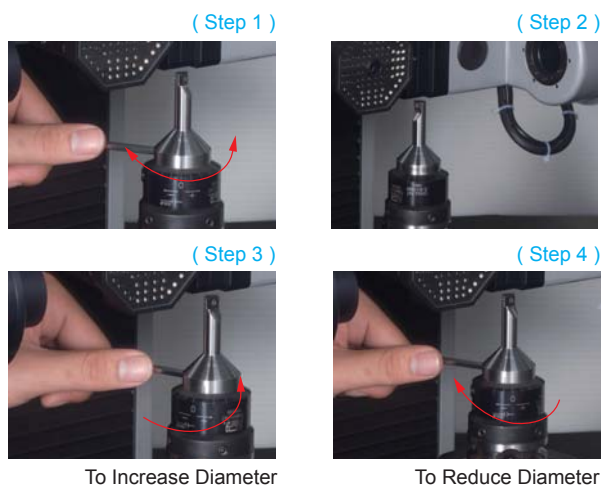
1. 用4mm扳手鬆開M8螺絲，不用取出螺絲
2. 用3mm扳手鬆開M6螺絲，不用取出螺絲
3. 取下舊頭部，更換新尺寸的頭部
4. 鎖緊M6預壓螺絲，扭力設定0.9 – 1.0Nm
5. 刀具設定儀預先調尺寸
6. 鎖緊M8鎖固螺絲，扭力設定8-9 Nm



- 尺寸調整步驟

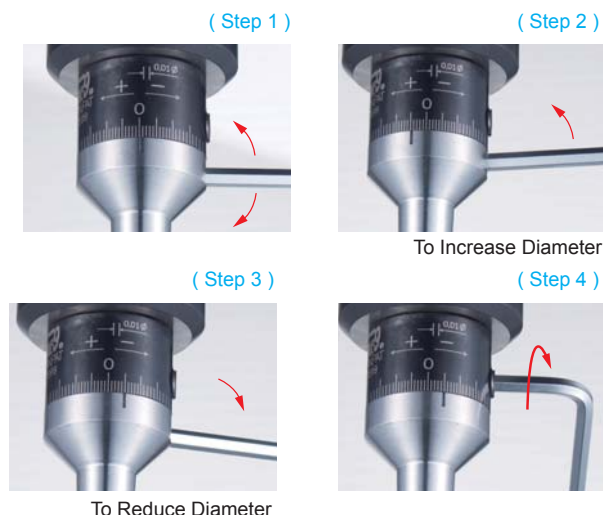
在刀具設定儀

1. 鬆開M8螺絲
2. 設定頭部在中間位置 (Step 1)
3. 量測尺寸值，並設定需要的尺寸 (Step 2)
4. 試加工後，依據所需的尺寸作調整 (Step 3, 4)
5. 鎖固M8螺絲



在切削中心機或銑床上的調整方式

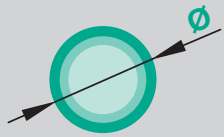
1. 設定在所需尺寸位置 (Step 1)
2. 鎖固M8螺絲
3. 先試搪一個孔，3 ~ 5mm深
4. 量測加工尺寸
5. 根據加工尺寸大小，作尺寸調整 (Step 2, 3)
6. 鎖緊M8鎖固螺絲 (Step 4)



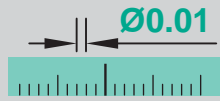
5

高速搪刀

99151深孔搪刀4 ~ 6xD



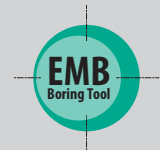
尺寸範圍:
4.87mm ~ 20.12mm



0.01mm/div
可在刀具設定儀
預先調尺寸



調整範圍
+0.12 / -0.13mm.



尺寸調整時
不用消除背隙

容易操作

- 4 ~ 6xD加工深度 · 動平衡良好

經濟實惠

- 低成本 · 高效率 · 可取代端銑刀、搪孔刀
- 更換刀片可切削各種不同材種

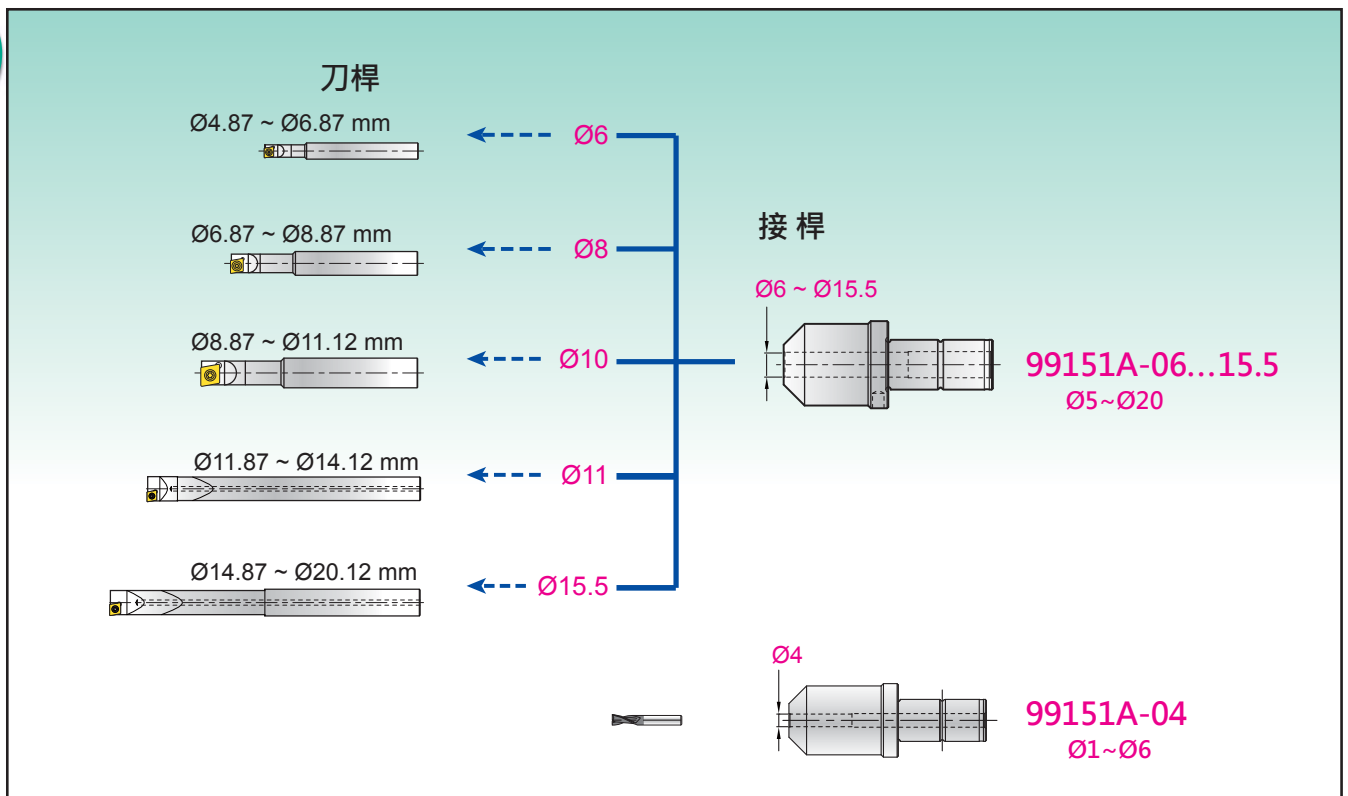
應用

- 取代端銑刀 · 尤其是小孔徑搪孔
- 電子零件 · 精密零組件加工



5

高速搪刀



99151龍捲風萬轉搪刀

接桿

• 搪孔刀經濟型解決方案



| Order No. | Part No. | ØD | L |
|-------------|------------|------|------|
| 99151A-04 | C20-ID04 | 4 | 49 |
| 99151A-06 | C20-ID06 | 6 | 52 |
| 99151A-08 | C20-ID08 | 8 | 49 |
| 99151A-10 | C20-ID10 | 10 | 42 |
| 99151A-11 | C20-ID11 | 11 | 21.5 |
| 99151A-15.5 | C20-ID15.5 | 15.5 | 21.5 |

鎢鋼刀桿 Ø5~Ø20

• 搪孔深度：L1, 4~6xD

| Order No. | Part No. | ØD | Ød | Ød1 | L1 | L | 刀片/螺絲/扳手 | Fig. |
|--------------|-----------------|-------------|------|-----|--------|-----|---|------|
| 99151-0500W | C06-0500-20L | 4.87~5.12 | 6 | - | 20.00 | 70 | CCGT030102 螺絲: NS-16030 0.4Nm 扳手:NK-T6 | |
| 99151-0525W | C06-0525-20L | 5.12~5.37 | 6 | - | 20.00 | 70 | | |
| 99151-0550W | C06-0550-22L | 5.37~5.62 | 6 | - | 22.00 | 70 | | |
| 99151-0575W | C06-0575-22L | 5.62~5.87 | 6 | - | 22.00 | 70 | | |
| 99151-0600W | C06-0600-24L | 5.87~6.12 | 6 | - | 24.00 | 70 | | |
| 99151-0625W | C06-0625-24L | 6.12~6.37 | 6 | - | 24.00 | 70 | | |
| 99151-0650W | C06-0650-26L | 6.37~6.62 | 6 | - | 26.00 | 70 | | |
| 99151-0675W | C06-0675-26L | 6.62~6.87 | 6 | - | 26.00 | 70 | | |
| 99151-0700W | C08-0700-28L | 6.87~7.12 | 8 | - | 28.00 | 85 | CCGT040102 螺絲: NS-20036 0.6Nm 扳手:NK-T6 | |
| 99151-0725W | C08-0725-28L | 7.12~7.37 | 8 | - | 28.00 | 85 | | |
| 99151-0750W | C08-0750-30L | 7.37~7.62 | 8 | - | 30.00 | 85 | | |
| 99151-0775W | C08-0775-30L | 7.62~7.87 | 8 | - | 30.00 | 85 | | |
| 99151-0800W | C08-0800-32L | 7.87~8.12 | 8 | - | 32.00 | 85 | | |
| 99151-0825W | C08-0825-32L | 8.12~8.37 | 8 | - | 32.00 | 85 | | |
| 99151-0850W | C08-0850-34L | 8.37~8.62 | 8 | - | 34.00 | 85 | | |
| 99151-0875W | C08-0875-34L | 8.62~8.87 | 8 | - | 34.00 | 85 | | |
| 99151-0900W | C10-0900-36L | 8.87~9.12 | 10 | - | 36.00 | 110 | CC...060204 螺絲: NS-25045 0.9Nm 扳手:NK-T7 | |
| 99151-0925W | C10-0925-36L | 9.12~9.37 | 10 | - | 36.00 | 110 | | |
| 99151-0950W | C10-0950-38L | 9.37~9.62 | 10 | - | 38.00 | 110 | | |
| 99151-0975W | C10-0975-38L | 9.62~9.87 | 10 | - | 38.00 | 110 | | |
| 99151-1000W | C10-1000-40L | 9.87~10.12 | 10 | - | 40.00 | 110 | | |
| 99151-1025W | C10-1025-40L | 10.12~10.37 | 10 | - | 40.00 | 110 | | |
| 99151-1050W | C10-1050-42L | 10.37~10.62 | 10 | - | 42.00 | 110 | | |
| 99151-1075W | C10-1075-42L | 10.62~10.87 | 10 | - | 42.00 | 110 | | |
| 99151-1100W | C10-1100-44L | 10.87~11.12 | 10 | - | 44.00 | 110 | | |
| 99151-1200WS | C11-1200-120L | 11.87~12.12 | 11 | - | 70.00 | 120 | CC...060204 螺絲: NS-25045 0.9Nm 扳手:NK-T7 | |
| 99151-1300WS | C11-1300-120L | 12.87~13.12 | 11 | - | 70.00 | 120 | | |
| 99151-1400WS | C11-1400-120L | 13.87~14.12 | 11 | - | 70.00 | 120 | | |
| 99151-1500W | C15.5-1500-180L | 14.87~15.12 | 15.5 | 14 | 90.00 | 180 | CC...060204 螺絲: NS-25060 0.9Nm 扳手:NK-T7 | |
| 99151-1600W | C15.5-1600-180L | 15.87~16.12 | 15.5 | 15 | 90.00 | 180 | | |
| 99151-1700W | C15.5-1700-180L | 16.87~17.12 | 15.5 | - | 100.00 | 180 | | |
| 99151-1800W | C15.5-1800-180L | 17.87~18.12 | 15.5 | - | 100.00 | 180 | | |
| 99151-1900W | C15.5-1900-180L | 18.87~19.12 | 15.5 | - | 100.00 | 180 | | |
| 99151-2000W | C15.5-2000-180L | 19.87~20.12 | 15.5 | - | 100.00 | 180 | | |

5

高速搪刀

研磨刀片

| 刀片 | | 敘述 | CCGT030102 | CCGT040102 | CCGW040102 | CCGH0602U | CCFT060204 | CCFW060204 | CCFT060204HP | CCMW060204 | | |
|----|----------|------------------------------|------------|------------|------------|-----------|------------|------------|--------------|------------|------|------|
| | NC30 | K20F、TiAlN鍍層適用於鑄鐵、碳鋼、合金鋼、不鏽鋼 | • | • | | | | | | | | |
| | DM | PCD焊刃經拋光處理後，可用於精修表面加工且延長刀具壽命 | | | • | | | | | • | | |
| | NC2032 | K20F、AlTiN 鍍層、適用於高速加工鑄鐵 | | | | | | • | | | | |
| | NC2033 | K20F、TiAlN鍍層、適用於碳鋼、合金鋼、不鏽鋼 | | | | | • | | | | | |
| | NC9031 | K20F、TiN鍍層、適用於鋁合金、銅及非鐵金屬 | | | | | | | • | | | |
| | NC9036 | K20F、DLC鍍層、壽命長、適用於鋁合金、銅及非鐵金屬 | • | • | | | • | | | | | |
| | U-XP9001 | K20F、適用於鋁合金鏡面加工 | | | | • | | | | | | |
| 尺寸 | | | | lc | 3.5 | 4.3 | 4.3 | 6.35 | 6.35 | 6.35 | 6.35 | 6.35 |
| | | | S | 1.4 | 1.8 | 1.8 | 2.38 | 2.38 | 2.38 | 2.38 | 2.38 | 2.38 |
| | | | re | 0.2 | 0.2 | 0.2 | - | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |

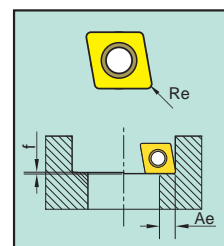
*建議使用扭力起子，請參考 6-22 頁

5

切削資料

- Note: Super fine finishing insert **U-XP9001** and **DM** with special specified cutting width **0.15mm**.(Radius) (see table below)

Spindle speed $S = \frac{V_c \times 1000}{\pi \times D}$ r.p.m. Feed rate: $f \times S$ mm/min.



| 工件材質 | Cutting conditions or surface finishes | Grade of insert | Cutting Speed Vc(m/min.) | feed rate f (mm/rev.) | Re0.2 | Re0.4 |
|-----------------------------------|--|-----------------|--------------------------|-----------------------|---------|-------|
| | | | | | Ae (mm) | |
| 碳鋼 | Regular cutting | NC2033 | 120-150-200 | 0.05-0.07-0.10 | 0.05 | 0.1 |
| | Interrupted cutting | NC30 | 100-120-140 | 0.04-0.05-0.08 | 0.05 | 0.1 |
| 合金鋼 | Regular cutting | NC2033 | 100-120-140 | 0.05-0.07-0.10 | 0.05 | 0.1 |
| | Interrupted cutting | NC30 | 80-100-120 | 0.04-0.05-0.08 | 0.05 | 0.1 |
| 不鏽鋼 | Regular cutting | NC2033 | 80-100-120 | 0.05-0.07-0.10 | 0.05 | 0.1 |
| | Interrupted cutting | NC30 | 70-80-100 | 0.05-0.07-0.10 | 0.05 | 0.1 |
| 鑄鐵 | Regular cutting | NC2032 NC30 | 80-100-120 | 0.05-0.07-0.10 | 0.05 | 0.1 |
| | Regular cutting | NC9036 NC9031 | 150-200-300 | 0.05-0.07-0.10 | 0.05 | 0.1 |
| Brass, Bronze and Al-alloy Si >6% | Super mirror finish | U-XP9001 | 150-200-300 | 0.15-0.2-0.25 | 0.05 | |
| | Regular cutting | NC9036 NC9031 | 150-200-300 | 0.05-0.07-0.10 | 0.05 | 0.1 |
| | Super finished | DM | 500-1000-2000 | 0.05-0.07-0.10 | 0.05 | 0.1 |
| 鋁、鋁合金 非鐵材質 | Super mirror finish | U-XP9001 | 150-200-300 | 0.15-0.20-0.25 | 0.05 | |
| | Regular cutting | NC30 | 80-100-120 | 0.04-0.06-0.08 | 0.05 | 0.1 |