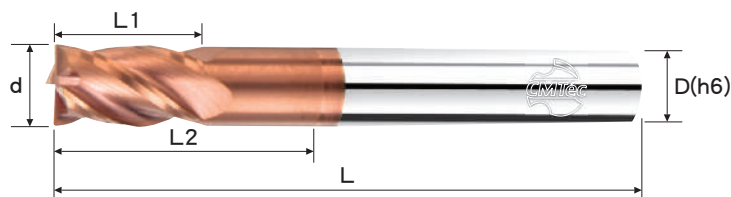


# N620 奈米鎢鋼平銑刀- 短刃型- 4刃

N620 NANO CARBIDE END MILLS- Square Type- Short Flute- 4F

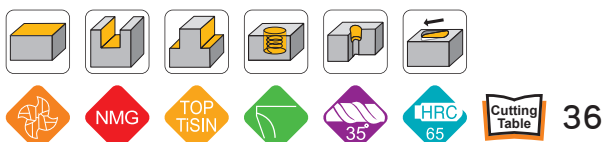
· NEDM40000A

· NED40000A



| 刃徑 d                  | 公差 Tolerance |
|-----------------------|--------------|
| $\phi < 3$            | 0 ~ -0.015   |
| $3 \leq \phi \leq 10$ | 0 ~ -0.03    |
| $10 < \phi$           | 0 ~ -0.03    |

|                      |   |
|----------------------|---|
| 超精銑 Bright Finishing | — |
| 精銑 Finishing         | ◎ |
| 中銑 Semi Finishing    | ◎ |
| 粗銑 Roughing          | ○ |

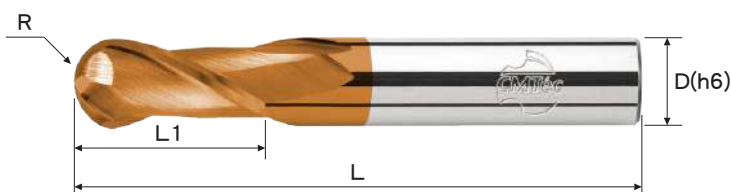


| 刃徑 d | 刃長 L1 | 有效長 L2 | 全長 L | 柄徑 D | 刃數 F | 鍍膜訂單編號<br>Coated Order No. |
|------|-------|--------|------|------|------|----------------------------|
| 1.0  | 1.0   | 2      | 50   | 4    | 4    | NEDM40100A                 |
| 1.5  | 1.5   | 3      | 50   | 4    | 4    | NEDM40150A                 |
| 2.0  | 2.0   | 4      | 50   | 4    | 4    | NEDM40200A                 |
| 2.5  | 2.5   | 5      | 50   | 4    | 4    | NEDM40250A                 |
| 3.0  | 3.0   | 8      | 50   | 6    | 4    | NED40300A                  |
| 4.0  | 4.0   | 10     | 50   | 6    | 4    | NED40400A                  |
| 5.0  | 5.0   | 14     | 50   | 6    | 4    | NED40500A                  |
| 6.0  | 6.0   | 16     | 50   | 6    | 4    | NED40600A                  |
| 8.0  | 8.0   | 24     | 60   | 8    | 4    | NED40800A                  |
| 10.0 | 10.0  | 32     | 75   | 10   | 4    | NED41000A                  |
| 12.0 | 12.0  | 36     | 75   | 12   | 4    | NED41200A                  |

# N620 奈米鎢鋼球型銑刀- 標準型- 2刃

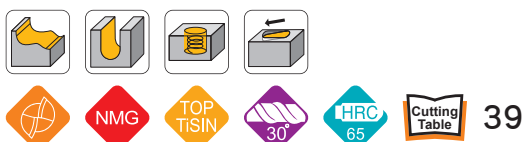
N620 NANO CARBIDE END MILLS- Ball Nose- 2F

· NEB20000A



| 半徑 R | 公差 Tolerance |
|------|--------------|
| R    | ±0.02        |

|                      |   |
|----------------------|---|
| 超精銑 Bright Finishing | ○ |
| 精銑 Finishing         | ◎ |
| 中銑 Semi Finishing    | ○ |
| 粗銑 Roughing          | — |



| 半徑 R | 刃長 L1 | 全長 L | 柄徑 D | 刃數 F | 鍍膜訂單編號<br>Coated Order No. |
|------|-------|------|------|------|----------------------------|
| 1.0R | 4     | 50   | 6    | 2    | NEB20100A                  |
| 1.5R | 6     | 50   | 6    | 2    | NEB20150A                  |
| 2.0R | 8     | 50   | 6    | 2    | NEB20200A                  |
| 3.0R | 12    | 50   | 6    | 2    | NEB20300A                  |
| 4.0R | 16    | 60   | 8    | 2    | NEB20400A                  |
| 5.0R | 20    | 75   | 10   | 2    | NEB20500A                  |
| 6.0R | 24    | 75   | 12   | 2    | NEB20600A                  |

Table 35

N620 奈米鎢鋼短刃型銑刀- 3刃(鍍膜) 切削條件表

## SOLID CARBIDE END MILLS- CUTTING CONDITION TABLE

## 側銑加工 Side Milling

## 溝銑加工 Slot Milling

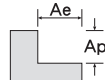
| 加工材質<br>Material              | 合金鋼<br>Alloy Steels                                                                                                               |               | 合金鋼<br>Alloy Steels |               | 調質鋼<br>Hardened Steels |               | 調質鋼<br>Hardened Steels |               | 鑄鐵<br>Cast Iron |               | 合金鋼<br>Alloy Steels                                                                                           | 合金鋼<br>Alloy Steels | 調質鋼<br>Hardened Steels | 鑄鐵<br>Cast Iron |            |               |        |       |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------|---------------|------------------------|---------------|------------------------|---------------|-----------------|---------------|---------------------------------------------------------------------------------------------------------------|---------------------|------------------------|-----------------|------------|---------------|--------|-------|
| 工件料號<br>Material Code         | SCM,SKT,SKD                                                                                                                       |               | SCM,SKT,SKD         |               | SKT,SKD                |               | SKT,SKD                |               | FC,FCD          |               | SCM,SKT,SKD                                                                                                   | SCM,SKT,SKD         | SKT,SKD                | FC,FCD          |            |               |        |       |
| 硬度<br>Hardness                | HRC20~30                                                                                                                          |               | HRC30~45            |               | HRC45~55               |               | HRC55~63               |               | HRC<30          |               | HRC20~30                                                                                                      | HRC30~45            | HRC45~55               | HRC<30          |            |               |        |       |
| 切削速度 Vc                       | 179m/min                                                                                                                          |               | 179m/min            |               | 134m/min               |               | 90m/min                |               | 179m/min        |               | 90m/min                                                                                                       | 89m/min             | 58m/min                | 107m/min        |            |               |        |       |
| 外徑<br>Diameter                | S<br>(rpm)                                                                                                                        | F<br>(mm/min) | S<br>(rpm)          | F<br>(mm/min) | S<br>(rpm)             | F<br>(mm/min) | S<br>(rpm)             | F<br>(mm/min) | S<br>(rpm)      | F<br>(mm/min) | S<br>(rpm)                                                                                                    | F<br>(mm/min)       | S<br>(rpm)             | F<br>(mm/min)   | S<br>(rpm) | F<br>(mm/min) |        |       |
| 3mm                           | 19,080                                                                                                                            | 1,260         | 19,080              | 790           | 14,310                 | 480           | 9,540                  | 310           | 19,080          | 1,575         | 9,540                                                                                                         | 625                 | 8,595                  | 355             | 6,210      | 256           | 11,430 | 945   |
| 4mm                           | 14,310                                                                                                                            | 1,305         | 14,310              | 820           | 10,710                 | 520           | 7,160                  | 330           | 14,310          | 1,620         | 7,155                                                                                                         | 652                 | 6,435                  | 373             | 4,635      | 270           | 8,595  | 990   |
| 6mm                           | 9,540                                                                                                                             | 1,440         | 9,540               | 945           | 7,155                  | 550           | 4,770                  | 360           | 9,540           | 1,800         | 4,770                                                                                                         | 747                 | 4,275                  | 409             | 3,105      | 297           | 5,715  | 1,080 |
| 8mm                           | 7,155                                                                                                                             | 1,305         | 7,155               | 895           | 5,355                  | 500           | 3,600                  | 330           | 7,155           | 1,620         | 3,600                                                                                                         | 729                 | 3,240                  | 396             | 2,340      | 270           | 4,275  | 945   |
| 10mm                          | 5,715                                                                                                                             | 1,170         | 5,715               | 880           | 4,275                  | 480           | 2,880                  | 280           | 5,715           | 1,440         | 3,600                                                                                                         | 706                 | 2,565                  | 378             | 1,845      | 234           | 3,420  | 855   |
| 12mm                          | 4,770                                                                                                                             | 1,170         | 4,770               | 860           | 3,600                  | 450           | 2,385                  | 280           | 4,770           | 1,440         | 2,385                                                                                                         | 661                 | 2,160                  | 364             | 1,530      | 234           | 2,880  | 855   |
| 切削量<br>Cutting Amount<br>(mm) | D≤6, Ap=1D, Ae=0.02D<br>D>6, Ap=1D, Ae=0.05D<br> |               |                     |               |                        |               |                        |               |                 |               | Ap=0.3D<br>Ap(Max)=3mm<br> |                     |                        |                 |            |               |        |       |

※ 切削公式 Cutting Formula : S(主軸轉速) = Vc(切削速度) × 1000 / D(外徑) / π (3.14)      F(進給速度) = fz(每刃進給量) × Z(刃數) × S(主軸轉速)

Table 36

N620 奈米鎢鋼短刃型銑刀- 4刃(鍍膜) 切削條件表

## SOLID CARBIDE END MILLS- CUTTING CONDITION TABLE

| 加工材質<br>Material           | 合金鋼<br>Alloy Steels                                                                                                              |               | 合金鋼<br>Alloy Steels |               | 調質鋼<br>Hardened Steels |               | 調質鋼<br>Hardened Steels |               | 鑄鐵<br>Cast Iron |               |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------|---------------|------------------------|---------------|------------------------|---------------|-----------------|---------------|
| 工件料號<br>Material Code      | SCM,SKT,SKD                                                                                                                      |               | SCM,SKT,SKD         |               | SKT,SKD                |               | SKT,SKD                |               | FC,FCD          |               |
| 硬度<br>Hardness             | HRC20~30                                                                                                                         |               | HRC30~45            |               | HRC45~55               |               | HRC55~63               |               | HRC<30          |               |
| 切削速度 Vc                    | 139m/min                                                                                                                         |               | 139m/min            |               | 118m/min               |               | 98m/min                |               | 158m/min        |               |
| 外徑<br>Diameter             | S<br>(rpm)                                                                                                                       | F<br>(mm/min) | S<br>(rpm)          | F<br>(mm/min) | S<br>(rpm)             | F<br>(mm/min) | S<br>(rpm)             | F<br>(mm/min) | S<br>(rpm)      | F<br>(mm/min) |
| 3mm                        | 14,750                                                                                                                           | 1,580         | 14,750              | 1,440         | 12,570                 | 1,040         | 10,490                 | 630           | 16,830          | 1,935         |
| 4mm                        | 10,990                                                                                                                           | 1,485         | 10,990              | 1,340         | 9,460                  | 980           | 7,875                  | 570           | 12,570          | 1,840         |
| 5mm                        | 8,810                                                                                                                            | 1,440         | 8,810               | 1,240         | 7,580                  | 910           | 6,290                  | 530           | 10,100          | 1,640         |
| 6mm                        | 7,380                                                                                                                            | 1,340         | 7,380               | 1,140         | 6,290                  | 830           | 5,250                  | 500           | 8,415           | 1,540         |
| 8mm                        | 5,500                                                                                                                            | 1,240         | 5,500               | 1,040         | 4,750                  | 760           | 3,960                  | 500           | 6,290           | 1,440         |
| 10mm                       | 4,410                                                                                                                            | 1,240         | 4,410               | 1,040         | 3,760                  | 760           | 3,170                  | 500           | 5,050           | 1,440         |
| 12mm                       | 3,660                                                                                                                            | 1,240         | 3,660               | 1,040         | 3,170                  | 760           | 2,630                  | 500           | 4,210           | 1,440         |
| 切削量<br>Cutting Amount (mm) | D≤6, Ap=1D, Ae=0.02D<br>D>6, Ap=1D, Ae=0.05D  |               |                     |               |                        |               |                        |               |                 |               |

※ 切削公式 Cutting Formula : S(主軸轉速) = Vc(切削速度) × 1000 / D(外徑) / π (3.14)      F(進給速度) = fz(每刃進給量) × Z(刃數) × S(主軸轉速)

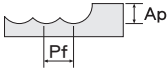
- 當加工聲音尖銳時，請調降主軸轉速(S) (10~40%)。 When the sound is piercing, please lower the spindle speed(S) (10~40%).
- 當機台震動太大時，請調降進給速度(F) (10~40%)。 When the machine is vibrating, please decrease the feed rate(F) (10~40%).
- 當主軸負載太大時，請調降進給速度(F) (10~40%)。 When the spindle load is high, please decrease the feed rate(F) (10~40%).
- 以上數據為建議值，適當的條件仍需視機台狀況，夾治具品質，潤滑冷卻系統...等而改變。

These are recommended values which depend on the condition of the machine, fixture, lubricating & cooling systems... etc. They may have to be adapted.

Table 39

N620 奈米鎢鋼短刃型 / 短刃長柄型球刀- 2刃(鍍膜) 切削條件表

## SOLID CARBIDE END MILLS- CUTTING CONDITION TABLE

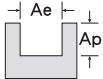
| 加工材質<br>Material              | 合金鋼<br>Alloy Steels                                                                                       |               | 合金鋼<br>Alloy Steels |               | 調質鋼<br>Hardened Steels |               | 調質鋼<br>Hardened Steels |               | 鑄鐵<br>Cast Iron |               |
|-------------------------------|-----------------------------------------------------------------------------------------------------------|---------------|---------------------|---------------|------------------------|---------------|------------------------|---------------|-----------------|---------------|
| 工件料號<br>Material Code         | SCM,SKT,SKD                                                                                               |               | SCM,SKT,SKD         |               | SKT,SKD                |               | SKT,SKD                |               | FC,FCD          |               |
| 硬度<br>Hardness                | HRC20~30                                                                                                  |               | HRC30~45            |               | HRC45~55               |               | HRC55~63               |               | HRC<30          |               |
| 切削速度 Vc                       | 230m/min                                                                                                  |               | 180m/min            |               | 140m/min               |               | 110m/min               |               | 230m/min        |               |
| 半徑<br>R                       | S<br>(rpm)                                                                                                | F<br>(mm/min) | S<br>(rpm)          | F<br>(mm/min) | S<br>(rpm)             | F<br>(mm/min) | S<br>(rpm)             | F<br>(mm/min) | S<br>(rpm)      | F<br>(mm/min) |
| 0.5R                          | 32,000                                                                                                    | 2,000         | 32,000              | 2,000         | 32,000                 | 1,700         | 32,000                 | 1,360         | 32,000          | 2,000         |
| 1.0R                          | 32,000                                                                                                    | 3,060         | 28,660              | 3,020         | 22,290                 | 1,870         | 17,520                 | 1,490         | 32,000          | 3,060         |
| 1.5R                          | 24,420                                                                                                    | 3,400         | 19,110              | 2,720         | 14,860                 | 1,700         | 11,680                 | 1,360         | 24,420          | 3,400         |
| 2.0R                          | 18,310                                                                                                    | 3,100         | 14,330              | 2,510         | 11,150                 | 1,620         | 8,760                  | 1,280         | 18,310          | 3,100         |
| 2.5R                          | 14,650                                                                                                    | 2,980         | 11,470              | 2,250         | 8,920                  | 1,450         | 7,010                  | 1,150         | 14,650          | 2,980         |
| 3.0R                          | 12,210                                                                                                    | 2,850         | 9,550               | 1,960         | 7,430                  | 1,320         | 5,840                  | 1,060         | 12,210          | 2,850         |
| 4.0R                          | 9,160                                                                                                     | 2,420         | 7,170               | 1,740         | 5,570                  | 1,150         | 4,380                  | 890           | 9,160           | 2,420         |
| 5.0R                          | 7,330                                                                                                     | 2,170         | 5,730               | 1,530         | 4,460                  | 980           | 3,500                  | 750           | 7,330           | 2,170         |
| 6.0R                          | 6,100                                                                                                     | 2,040         | 4,780               | 1,400         | 3,720                  | 820           | 2,920                  | 680           | 6,100           | 2,040         |
| 切削量<br>Cutting Amount<br>(mm) | Ap=0.02D<br>Pf=0.05D<br> |               |                     |               |                        |               |                        |               |                 |               |

※ 切削公式 Cutting Formula : S(主軸轉速) = Vc(切削速度) × 1000 / D(外徑) / π (3.14)      F(進給速度) = fz(每刃進給量) × Z(刃數) × S(主軸轉速)

Table 40

N620 奈米鎢鋼短刃長頸型銑刀- 2刃(鍍膜) 切削條件表

## SOLID CARBIDE END MILLS- CUTTING CONDITION TABLE

| 加工材質<br>Material              | 合金鋼<br>Alloy Steels                                                                 |               |            | 合金鋼<br>Alloy Steels |               |            | 調質鋼<br>Hardened Steels |               |            | 調質鋼<br>Hardened Steels |               |            | 鑄鐵<br>Cast Iron |               |            |
|-------------------------------|-------------------------------------------------------------------------------------|---------------|------------|---------------------|---------------|------------|------------------------|---------------|------------|------------------------|---------------|------------|-----------------|---------------|------------|
| 工件料號<br>Material Code         | SCM,SKT,SKD                                                                         |               |            | SCM,SKT,SKD         |               |            | SKT,SKD                |               |            | SKT,SKD                |               |            | FC,FCD          |               |            |
| 硬度<br>Hardness                | HRC20~30                                                                            |               |            | HRC30~45            |               |            | HRC45~55               |               |            | HRC 55~63              |               |            | HRC<30          |               |            |
| 切削速度 Vc                       | 59m/min                                                                             |               |            | 59m/min             |               |            | 42m/min                |               |            | 25m/min                |               |            | 67m/min         |               |            |
| 外徑<br>Diameter                | S<br>(rpm)                                                                          | F<br>(mm/min) | Ap<br>(mm) | S<br>(rpm)          | F<br>(mm/min) | Ap<br>(mm) | S<br>(rpm)             | F<br>(mm/min) | Ap<br>(mm) | S<br>(rpm)             | F<br>(mm/min) | Ap<br>(mm) | S<br>(rpm)      | F<br>(mm/min) | Ap<br>(mm) |
| 0.5mm- 2E                     | 25,200                                                                              | 270           | 0.045      | 25,200              | 135           | 0.038      | 18,900                 | 45            | 0.019      | 13,500                 | 27            | 0.009      | 25,200          | 360           | 0.049      |
| 0.5mm- 4E                     | 21,600                                                                              | 180           | 0.021      | 21,600              | 90            | 0.018      | 16,200                 | 27            | 0.009      | 13,500                 | 27            | 0.009      | 21,600          | 225           | 0.023      |
| 1.0mm- 6E                     | 18,000                                                                              | 540           | 0.07       | 17,100              | 450           | 0.06       | 10,800                 | 135           | 0.03       | 7,200                  | 45            | 0.014      | 18,000          | 630           | 0.07       |
| 1.0mm- 8E                     | 15,300                                                                              | 315           | 0.04       | 14,400              | 270           | 0.04       | 9,000                  | 90            | 0.02       | 7,200                  | 45            | 0.014      | 16,200          | 360           | 0.05       |
| 1.5mm- 8E                     | 10,800                                                                              | 315           | 0.1        | 9,900               | 270           | 0.08       | 6,300                  | 90            | 0.04       | 4,500                  | 45            | 0.021      | 11,700          | 360           | 0.11       |
| 2.0mm- 8E                     | 9,000                                                                               | 540           | 0.26       | 9,000               | 450           | 0.22       | 5,400                  | 135           | 0.11       | 3,600                  | 90            | 0.06       | 9,900           | 630           | 0.29       |
| 2.0mm- 10E                    | 7,200                                                                               | 315           | 0.24       | 8,100               | 270           | 0.2        | 4,500                  | 90            | 0.1        | 2,700                  | 45            | 0.05       | 8,100           | 360           | 0.26       |
| 2.0mm- 12E                    | 7,200                                                                               | 315           | 0.13       | 8,100               | 270           | 0.11       | 4,500                  | 90            | 0.06       | 2,700                  | 45            | 0.03       | 8,100           | 360           | 0.14       |
| 3.0mm- 08E                    | 6,300                                                                               | 540           | 0.36       | 6,300               | 450           | 0.3        | 4,500                  | 135           | 0.15       | 2,700                  | 90            | 0.08       | 7,200           | 630           | 0.39       |
| 3.0mm- 12E                    | 6,300                                                                               | 540           | 0.27       | 6,300               | 450           | 0.23       | 4,500                  | 135           | 0.11       | 2,700                  | 90            | 0.055      | 7,200           | 630           | 0.29       |
| 3.0mm- 16E                    | 6,300                                                                               | 315           | 0.2        | 5,400               | 270           | 0.17       | 3,600                  | 90            | 0.08       | 2,250                  | 45            | 0.04       | 6,300           | 360           | 0.22       |
| 3.0mm- 20E                    | 6,300                                                                               | 315           | 0.13       | 5,400               | 270           | 0.11       | 3,600                  | 90            | 0.05       | 2,250                  | 45            | 0.025      | 6,300           | 360           | 0.14       |
| 4.0mm- 16E                    | 4,500                                                                               | 540           | 0.36       | 4,500               | 450           | 0.3        | 2,700                  | 135           | 0.15       | 1,800                  | 90            | 0.075      | 4,500           | 630           | 0.39       |
| 4.0mm- 20E                    | 4,500                                                                               | 315           | 0.34       | 3,600               | 270           | 0.28       | 1,800                  | 90            | 0.14       | 900                    | 90            | 0.07       | 4,500           | 360           | 0.36       |
| 5.0mm- 20E                    | 3,600                                                                               | 450           | 0.45       | 3,150               | 450           | 0.38       | 1,800                  | 135           | 0.19       | 1,800                  | 90            | 0.09       | 3,600           | 540           | 0.49       |
| 5.0mm- 30E                    | 2,700                                                                               | 270           | 0.33       | 2,700               | 180           | 0.28       | 1,800                  | 135           | 0.14       | 1,800                  | 90            | 0.07       | 2,700           | 270           | 0.36       |
| 切削量<br>Cutting Amount<br>(mm) |  |               |            |                     |               |            |                        |               |            |                        |               |            |                 |               |            |

- 當加工聲音尖銳時，請調降主軸轉速(S) (10~40%)。 When the sound is piercing, please lower the spindle speed(S) (10~40%).
- 當機台震動太大時，請調降進給速度(F) (10~40%)。 When the machine is vibrating, please decrease the feed rate(F) (10~40%).
- 當主軸負載太大時，請調降進給速度(F) (10~40%)。 When the spindle load is high, please decrease the feed rate(F) (10~40%).
- 以上數據為建議值，適當的條件仍需視機台狀況，夾治具品質，潤滑冷卻系統...等而改變。  
These are recommended values which depend on the condition of the machine, fixture, lubricating & cooling systems... etc. They may have to be adapted.