

|  | MATERIAL                            | OPERATION                                    | CONDITION                | EDGE PREP.               | GRADE                  | Vc (m/min)            | fn (mm/rev)           | COOLANT               |                       |
|--|-------------------------------------|--|--------------------------|--------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| TURNING                                      | Hardened steel                      | finishing<br>ap < 0.5 mm                     |                          | SE                       | NBL050C                | 140 <b>190</b> 240    | 0.06 <b>0.14</b> 0.22 |                       |                       |
|  |                                     |  |                          | UE                       | NBL150C<br>tool life   | 120 <b>170</b> 220    | 0.06 <b>0.15</b> 0.24 |                       |                       |
|  |                                     |  |                          |                          | NBL250C<br>reliability | 100 <b>150</b> 200    |                       |                       |                       |
| THREADING                                    | Bearing steel                       | finishing<br>ap < 0.5 mm                     |                          | SE                       | NBL050C                | 120 <b>170</b> 220    | 0.05 <b>0.10</b> 0.15 |                       |                       |
|  |                                     |  |                          | UE                       | NBL150C<br>tool life   | 100 <b>150</b> 200    | 0.06 <b>0.13</b> 0.20 |                       |                       |
|  |                                     |  |                          |                          | NBL250C<br>reliability | 80 <b>130</b> 180     |                       |                       |                       |
|  |                                     |  | RE                       | NBL350C                  | 80 <b>120</b> 160      | 0.06 <b>0.16</b> 0.26 |                       |                       |                       |
|  |                                     | roughing<br>ap > 0.5 mm<br><b>SOLID PCBN</b> |                          | UE                       | NBH900U                | 100 <b>140</b> 180    | 0.15 <b>0.30</b> 0.45 |                       |                       |
|  | UE                                  |  | NBH950U                  | 80 <b>120</b> 160        | 0.10 <b>0.25</b> 0.40  |                       |                       |                       |                       |
| H  | Tool steel                          | finishing<br>ap < 0.5 mm                     |                          | SE                       | NBL150C                | 100 <b>140</b> 180    | 0.04 <b>0.09</b> 0.14 |                       |                       |
|  |                                     |  |                          | UE                       | NBL250C                | 80 <b>120</b> 160     | 0.05 <b>0.12</b> 0.19 |                       |                       |
|  |                                     |  |                          | RE                       | NBL350C                | 60 <b>100</b> 140     | 0.06 <b>0.13</b> 0.20 |                       |                       |
|  |                                     | roughing<br>ap > 0.5 mm<br><b>SOLID PCBN</b> |                          | UE                       | NBH900U                | 60 <b>100</b> 140     | 0.10 <b>0.30</b> 0.50 |                       |                       |
|  |                                     |  |                          | UE                       | NBH950U                | 40 <b>80</b> 120      | 0.10 <b>0.25</b> 0.40 |                       |                       |
|  |                                     | High speed steel                             | finishing<br>ap < 0.5 mm |                          | UE                     | NBL150C               | 100 <b>120</b> 140    | 0.05 <b>0.08</b> 0.11 |                       |
|  |                                     |  |                          |                          | UE                     | NBH500C               | 60 <b>120</b> 180     | 0.10 <b>0.30</b> 0.50 |                       |
| MILLING                                      | White cast iron                     | finishing<br>ap < 0.5 mm                     |                          | UE                       | NBH900U                | 40 <b>80</b> 120      | 0.10 <b>0.25</b> 0.40 |                       |                       |
|  |                                     |  |                          | UE                       | NBH500C                | 60 <b>90</b> 120      | 0.20 <b>0.40</b> 0.60 |                       |                       |
|  |                                     | roughing<br>ap > 0.5 mm<br><b>SOLID PCBN</b> |                          | UE                       | NBH950U                | 40 <b>60</b> 80       | 0.20 <b>0.35</b> 0.50 |                       |                       |
|  |                                     |  |                          | UE                       | NBH450C                | 400 <b>800</b> 1200   | 0.10 <b>0.25</b> 0.40 |                       |                       |
| K  | Gray cast iron                      | finishing<br>ap < 0.5 mm                     |                          | UE                       | NBH500C                | 600 <b>1000</b> 1400  | 0.10 <b>0.20</b> 0.30 |                       |                       |
|  |                                     |  |                          | UE                       | NBH500C                | 600 <b>1000</b> 1400  | 0.20 <b>0.40</b> 0.60 |                       |                       |
|  |                                     | roughing<br>ap > 0.5 mm<br><b>SOLID PCBN</b> |                          | UE                       | NBH900U<br>tool life   | 400 <b>800</b> 1200   | 0.20 <b>0.35</b> 0.50 |                       |                       |
|  |                                     |  |                          | UE                       | NBH950U<br>reliability | 400 <b>700</b> 1000   |                       |                       |                       |
|  |                                     | DRILLING                                     | ADI cast iron            | finishing<br>ap < 0.5 mm |                        | UE                    | NBL150C               | 500 <b>600</b> 700    | 0.05 <b>0.15</b> 0.25 |
|  | UE                                  |  |                          |                          | NBL250C                | 400 <b>500</b> 600    | 0.05 <b>0.15</b> 0.25 |                       |                       |
| roughing<br>ap > 0.5 mm<br><b>SOLID PCBN</b> |                                     |  |                          | UE                       | NBH500C                | 300 <b>400</b> 500    | 0.10 <b>0.25</b> 0.40 |                       |                       |
| P  | Sintered powder metal, high alloyed | finishing<br>ap < 0.5 mm                     |                          | UE                       | NBH900U<br>tool life   | 200 <b>250</b> 300    | 0.10 <b>0.25</b> 0.40 |                       |                       |
|  |                                     |  |                          | UE                       | NBH950U<br>reliability | 180 <b>230</b> 280    |                       |                       |                       |
| ACCESSORIES                                  | Sintered powder metal, low alloyed  | finishing<br>ap < 0.5 mm                     |                          | UE                       | NBL150C                | 80 <b>160</b> 240     | 0.05 <b>0.10</b> 0.15 |                       |                       |
|  |                                     | finishing<br>ap < 0.5 mm                     |                          | UE                       | NBH450C                | 140 <b>220</b> 300    | 0.10 <b>0.20</b> 0.30 |                       |                       |

Stable machining, continuous cut  
 General machining, light interruption  
 Unstable machining, interrupted cut

TURNING

THREADING

GROOVING

MILLING

DRILLING

ACCESSORIES

| SN                     | PCBN<br>Negative |                                       |      |        | ISO513                    | BL         |            |           |             | BH          |             |             |         | ◀ SINTERED POWDER METAL |
|------------------------|------------------|---------------------------------------|------|--------|---------------------------|------------|------------|-----------|-------------|-------------|-------------|-------------|---------|-------------------------|
|                        | Size             | IC                                    | S    | D1     |                           | NBL050C    | NBL150C    | NBL250C   | NBL350C     | NBH450C     | NBH500C     | NBH900U     | NBH950U |                         |
| <p>8 edges</p>         | <b>0903</b> □    | 9.525                                 | 3.18 | -      | <b>P</b>                  | 80<br>240  |            |           |             | 140<br>300  |             |             |         |                         |
|                        | <b>1204</b> □    | 12.70                                 | 4.76 | (5.16) | <b>M</b>                  |            |            |           |             |             |             |             |         |                         |
|                        | <b>1207</b> □    | 12.70                                 | 7.94 | -      | <b>K</b>                  |            |            |           | 400<br>1200 | 300<br>1400 | 200<br>1200 | 180<br>1000 |         |                         |
|                        |                  |                                       |      |        | <b>N</b>                  |            |            |           |             |             |             |             |         |                         |
|                        |                  |                                       |      |        | <b>S</b>                  |            |            |           |             |             |             |             |         |                         |
|                        |                  |                                       |      |        | <b>H</b>                  | 120<br>240 | 100<br>220 | 80<br>200 | 60<br>160   | 60<br>180   | 40<br>180   | 40<br>160   |         |                         |
| GRADE APPLICATION AREA |                  | Stable machining, continuous cut      |      |        |                           |            |            |           |             |             |             |             |         |                         |
| main application       |                  | General machining, light interruption |      |        | + Hardness<br>- Toughness |            |            |           |             |             |             |             |         |                         |
| applicable             |                  | Unstable machining, interrupted cut   |      |        | - Hardness<br>+ Toughness |            |            |           |             |             |             |             |         |                         |

| UNIVERSAL           | UE <b>K</b> <b>H</b> | SNGA | Size          | RE     | a <sub>p</sub> ▶<br>f <sub>n</sub> ▶           | 1.00<br><b>2.00</b><br>0.10 | 3.00<br>3.00<br>0.35 | BL      |         |         |         | BH      |         |         |         |   |   |
|---------------------|----------------------|------|---------------|--------|--|-----------------------------|----------------------|---------|---------|---------|---------|---------|---------|---------|---------|---|---|
|                     |                      |      |               |        |  |                             |                      | NBL050C | NBL150C | NBL250C | NBL350C | NBH450C | NBH500C | NBH900U | NBH950U |   |   |
| vertical            |                      | SNGA | 120404S-UE-8V | RE 0.4 | a <sub>p</sub> ▶ 0.07<br>f <sub>n</sub> ▶ 0.08 | <b>0.16</b><br><b>0.14</b>  | 0.25<br>0.20         |         |         |         |         |         |         |         |         | ● |   |
|                     |                      |      | 120408S-UE-8V | RE 0.8 | a <sub>p</sub> ▶ 0.07<br>f <sub>n</sub> ▶ 0.08 | <b>0.16</b><br><b>0.15</b>  | 0.25<br>0.22         | ○       | ○       |         |         |         |         |         |         |   | ● |
|                     |                      |      | 120412S-UE-8V | RE 1.2 | a <sub>p</sub> ▶ 0.07<br>f <sub>n</sub> ▶ 0.08 | <b>0.16</b><br><b>0.16</b>  | 0.25<br>0.24         |         |         |         |         |         |         |         |         |   | ● |
| solid               |                      | SNGA | 120412S-UE    | RE 1.2 | a <sub>p</sub> ▶ 1.00<br>f <sub>n</sub> ▶ 0.10 | <b>2.00</b><br><b>0.22</b>  | 3.00<br>0.35         |         |         |         |         |         |         |         |         | ● |   |
| solid, without hole |                      | SNGN | 090308S-UE    | RE 0.8 | a <sub>p</sub> ▶ 0.50<br>f <sub>n</sub> ▶ 0.10 | <b>1.50</b><br><b>0.20</b>  | 2.50<br>0.30         |         |         |         |         |         |         |         |         | ● |   |
|                     |                      |      | 090312S-UE    | RE 1.2 | a <sub>p</sub> ▶ 0.50<br>f <sub>n</sub> ▶ 0.10 | <b>1.50</b><br><b>0.22</b>  | 2.50<br>0.35         |         |         |         |         |         |         |         |         | ● |   |
|                     |                      |      | 090316S-UE    | RE 1.6 | a <sub>p</sub> ▶ 0.50<br>f <sub>n</sub> ▶ 0.10 | <b>1.50</b><br><b>0.25</b>  | 2.50<br>0.40         |         |         |         |         |         |         |         |         |   | ● |
|                     |                      | SNGN | 120408S-UE    | RE 0.8 | a <sub>p</sub> ▶ 1.00<br>f <sub>n</sub> ▶ 0.10 | <b>2.00</b><br><b>0.20</b>  | 3.00<br>0.30         |         |         |         |         |         |         |         |         |   | ● |
|                     |                      |      | 120412S-UE    | RE 1.2 | a <sub>p</sub> ▶ 1.00<br>f <sub>n</sub> ▶ 0.10 | <b>2.00</b><br><b>0.22</b>  | 3.00<br>0.35         |         |         |         |         |         |         |         |         |   | ● |
|                     |                      |      | 120416S-UE    | RE 1.6 | a <sub>p</sub> ▶ 1.00<br>f <sub>n</sub> ▶ 0.10 | <b>2.00</b><br><b>0.25</b>  | 3.00<br>0.40         |         |         |         |         |         |         |         |         |   | ○ |
| solid, with dimple  |                      | SNGX | 120712S-UE    | RE 1.2 | a <sub>p</sub> ▶ 1.00<br>f <sub>n</sub> ▶ 0.10 | <b>2.00</b><br><b>0.22</b>  | 3.00<br>0.35         |         |         |         |         |         |         |         |         | ○ |   |
|                     |                      |      | 120716S-UE    | RE 1.6 | a <sub>p</sub> ▶ 1.00<br>f <sub>n</sub> ▶ 0.10 | <b>2.00</b><br><b>0.25</b>  | 3.00<br>0.40         |         |         |         |         |         |         |         |         | ○ |   |

● stock standard, ○ non-standard stock

