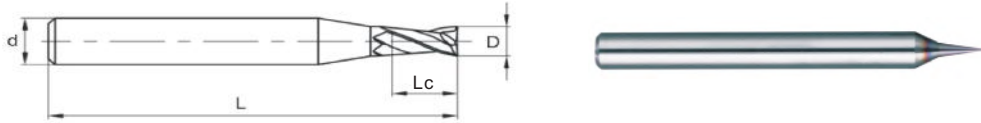


# Micro Square End Mill



## 2 FLUTES SQUARE



|                           |             |                      |                |                 |                  |                   |
|---------------------------|-------------|----------------------|----------------|-----------------|------------------|-------------------|
|                           | 2Flutes     | Cobalt 10%           | HRC 48         | X3H Coating     | UMG 0.5µm        | Materials Carbide |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                  |                   |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys | Copper Alloys     |
| <HRC35                    | <HRC48      | HRC48-55             | HRC55-60       |                 |                  |                   |
|                           |             |                      |                |                 | ●                | ●                 |

| Order No.   | D(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|-------------|-------|-------|--------|-------|--------|-------|
| TMALS010-2F | 0.10  | 4     | 0.2    | 50    | 2      | ▲     |
| TMALS015-2F | 0.15  | 4     | 0.3    | 50    | 2      | ▲     |
| TMALS020-2F | 0.20  | 4     | 0.4    | 50    | 2      | ▲     |
| TMALS025-2F | 0.25  | 4     | 0.5    | 50    | 2      | ▲     |
| TMALS030-2F | 0.30  | 4     | 0.6    | 50    | 2      | ▲     |
| TMALS035-2F | 0.35  | 4     | 0.7    | 50    | 2      | ▲     |
| TMALS040-2F | 0.40  | 4     | 0.8    | 50    | 2      | ▲     |
| TMALS045-2F | 0.45  | 4     | 0.9    | 50    | 2      | ▲     |
| TMALS050-2F | 0.50  | 4     | 1.0    | 50    | 2      | ▲     |
| TMALS060-2F | 0.60  | 4     | 1.2    | 50    | 2      | ▲     |
| TMALS070-2F | 0.70  | 4     | 1.4    | 50    | 2      | ▲     |
| TMALS080-2F | 0.80  | 4     | 1.6    | 50    | 2      | ▲     |
| TMALS090-2F | 0.90  | 4     | 1.8    | 50    | 2      | ▲     |

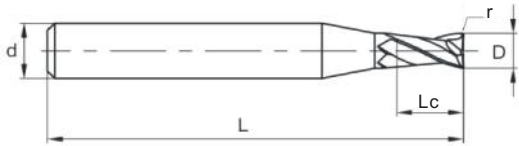
Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B103

|   |
|---|
| TCM45<br>for General Steels                             |
| TOTIME65<br>for Die Steels<br>Hardened Steels           |
| TOTIME48<br>for Non-ferrous<br>Metal                    |
| TOTIME3839<br>for General Steels<br>Cast Irons          |
| TDIA<br>for Graphite                                    |
| Micro Diameter<br>for Aluminium Alloys<br>Copper Alloys |
| ZSTNB/ZSTNR<br>for General Steels<br>Die Steels         |
| CBN<br>High Hardness<br>Materials                       |

# Micro Corner Radius End Mill

## 2 FLUTES CORNER RADIUS



|                           |             |                      |                |                 |                  |                   |
|---------------------------|-------------|----------------------|----------------|-----------------|------------------|-------------------|
|                           | 2Flutes     | Cobalt 10%           | HRC 48         | X3H Coating     | UMG 0.5µm        | Materials Carbide |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                  |                   |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys | Copper Alloys     |
| <HRC35                    | <HRC48      | HRC48-55             | HRC55-60       |                 |                  |                   |
|                           |             |                      |                |                 | ●                | ●                 |

| Order No.     | D(mm) | r(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|---------------|-------|-------|-------|--------|-------|--------|-------|
| TMALCR0202-2F | 0.2   | 0.02  | 4     | 0.4    | 50    | 2      | ▲     |
| TMALCR0205-2F | 0.2   | 0.05  | 4     | 0.4    | 50    | 2      | ▲     |
| TMALCR0305-2F | 0.3   | 0.05  | 4     | 0.6    | 50    | 2      | ▲     |
| TMALCR0310-2F | 0.3   | 0.10  | 4     | 0.6    | 50    | 2      | ▲     |
| TMALCR0405-2F | 0.4   | 0.05  | 4     | 0.8    | 50    | 2      | ▲     |
| TMALCR0410-2F | 0.4   | 0.10  | 4     | 0.8    | 50    | 2      | ▲     |
| TMALCR0505-2F | 0.5   | 0.05  | 4     | 1.0    | 50    | 2      | ▲     |
| TMALCR0510-2F | 0.5   | 0.10  | 4     | 1.0    | 50    | 2      | ▲     |
| TMALCR0605-2F | 0.6   | 0.05  | 4     | 1.2    | 50    | 2      | ▲     |
| TMALCR0610-2F | 0.6   | 0.10  | 4     | 1.2    | 50    | 2      | ▲     |
| TMALCR0705-2F | 0.7   | 0.05  | 4     | 1.4    | 50    | 2      | ▲     |
| TMALCR0710-2F | 0.7   | 0.10  | 4     | 1.4    | 50    | 2      | ▲     |
| TMALCR0805-2F | 0.8   | 0.05  | 4     | 1.6    | 50    | 2      | ▲     |
| TMALCR0810-2F | 0.8   | 0.10  | 4     | 1.6    | 50    | 2      | ▲     |

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions B103

TOTIME45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-ferrous  
Metal

TOTIME3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for Aluminium Alloys  
Copper Alloys

ZSTN/ZSTNR  
for General Steels  
Die Steels

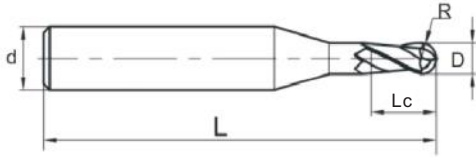
CBN  
High Hardness  
Materials



# Micro Ball Nose End Mill



## 2 FLUTES BALL NOSE



|                           |             |                      |                |                 |                   |               |
|---------------------------|-------------|----------------------|----------------|-----------------|-------------------|---------------|
| 2Flutes                   | Cobalt 10%  | HRC 48               | X3H Coating    | UMG 0.5µm       | Materials Carbide |               |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                   |               |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys  | Copper Alloys |
| <HRC35                    | <HRC48      | HRC48-55             | HRC55-60       |                 |                   |               |
|                           |             |                      |                |                 | ●                 | ●             |

| Order No.   | D(mm) | R(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|-------------|-------|-------|-------|--------|-------|--------|-------|
| TMALB020-2F | 0.2   | 0.10  | 4     | 0.4    | 50    | 2      | ▲     |
| TMALB030-2F | 0.3   | 0.15  | 4     | 0.6    | 50    | 2      | ▲     |
| TMALB040-2F | 0.4   | 0.20  | 4     | 0.8    | 50    | 2      | ▲     |
| TMALB050-2F | 0.5   | 0.25  | 4     | 1.0    | 50    | 2      | ▲     |
| TMALB060-2F | 0.6   | 0.30  | 4     | 1.2    | 50    | 2      | ▲     |
| TMALB070-2F | 0.7   | 0.35  | 4     | 1.4    | 50    | 2      | ▲     |
| TMALB080-2F | 0.8   | 0.40  | 4     | 1.6    | 50    | 2      | ▲     |

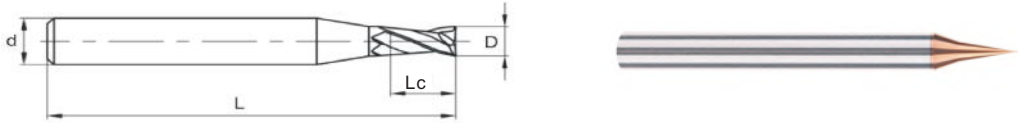
▲ Stock    △ Non-Stock  
Recommended Cutting Conditions B103

|   |
|---|
| TCM45<br>for General Steels                             |
| TOTIME65<br>for Die Steels<br>Hardened Steels           |
| TOTIME48<br>for Non-ferrous<br>Metal                    |
| TOTIME3839<br>for General Steels<br>Cast Irons          |
| TDIA<br>for Graphite                                    |
| Micro Diameter<br>for Aluminium Alloys<br>Copper Alloys |
| ZSTNB/ZSTNR<br>for General Steels<br>Die Steels         |
| CBN<br>High Hardness<br>Materials                       |

# Micro Square End Mill



2 FLUTES SQUARE



|                           |             |                      |                |                 |                  |                   |
|---------------------------|-------------|----------------------|----------------|-----------------|------------------|-------------------|
|                           | 2Flutes     | Cobalt 10%           | HRC 48         | AP Coating      | MG 0.8µm         | Materials Carbide |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                  |                   |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys | Copper Alloys     |
| <HRC35                    | HRC35-45    | HRC45-55             | HRC55-60       |                 |                  |                   |
| ●                         | ●           |                      |                | ●               |                  |                   |

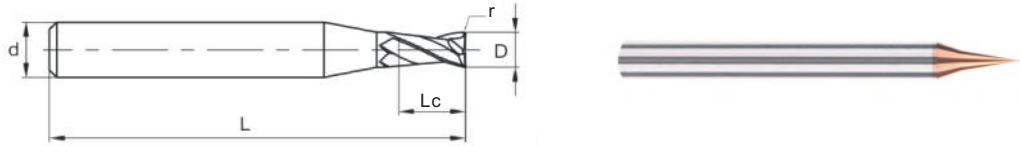
| Order No.  | D(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|------------|-------|-------|--------|-------|--------|-------|
| TMUS010-2F | 0.10  | 4     | 0.2    | 50    | 2      | ▲     |
| TMUS015-2F | 0.15  | 4     | 0.3    | 50    | 2      | ▲     |
| TMUS020-2F | 0.20  | 4     | 0.4    | 50    | 2      | ▲     |
| TMUS025-2F | 0.25  | 4     | 0.5    | 50    | 2      | ▲     |
| TMUS030-2F | 0.30  | 4     | 0.6    | 50    | 2      | ▲     |
| TMUS035-2F | 0.35  | 4     | 0.7    | 50    | 2      | ▲     |
| TMUS040-2F | 0.40  | 4     | 0.8    | 50    | 2      | ▲     |
| TMUS045-2F | 0.45  | 4     | 0.9    | 50    | 2      | ▲     |
| TMUS050-2F | 0.50  | 4     | 1.0    | 50    | 2      | ▲     |
| TMUS060-2F | 0.60  | 4     | 1.2    | 50    | 2      | ▲     |
| TMUS070-2F | 0.70  | 4     | 1.4    | 50    | 2      | ▲     |
| TMUS080-2F | 0.80  | 4     | 1.6    | 50    | 2      | ▲     |
| TMUS090-2F | 0.90  | 4     | 1.8    | 50    | 2      | ▲     |

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions B104

# Micro Corner Radius End Mill



## 2 FLUTES CORNER RADIUS



|                           |             |                      |                |                 |                  |                   |  |
|---------------------------|-------------|----------------------|----------------|-----------------|------------------|-------------------|--|
|                           | 2Flutes     | Cobalt 10%           | HRC 48         | AP Coating      | MG 0.8μm         | Materials Carbide |  |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                  |                   |  |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys | Copper Alloys     |  |
| <HRC35                    | HRC35-45    | HRC45-55             | HRC55-60       |                 |                  |                   |  |
| ●                         | ●           |                      |                | ●               |                  |                   |  |

| Order No.    | D(mm) | r(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|--------------|-------|-------|-------|--------|-------|--------|-------|
| TMUCR0202-2F | 0.2   | 0.02  | 4     | 0.4    | 50    | 2      | ▲     |
| TMUCR0205-2F | 0.2   | 0.05  | 4     | 0.4    | 50    | 2      | ▲     |
| TMUCR0305-2F | 0.3   | 0.05  | 4     | 0.6    | 50    | 2      | ▲     |
| TMUCR0310-2F | 0.3   | 0.10  | 4     | 0.6    | 50    | 2      | ▲     |
| TMUCR0405-2F | 0.4   | 0.05  | 4     | 0.8    | 50    | 2      | ▲     |
| TMUCR0410-2F | 0.4   | 0.10  | 4     | 0.8    | 50    | 2      | ▲     |
| TMUCR0505-2F | 0.5   | 0.05  | 4     | 1.0    | 50    | 2      | ▲     |
| TMUCR0510-2F | 0.5   | 0.10  | 4     | 1.0    | 50    | 2      | ▲     |
| TMUCR0605-2F | 0.6   | 0.05  | 4     | 1.2    | 50    | 2      | ▲     |
| TMUCR0610-2F | 0.6   | 0.10  | 4     | 1.2    | 50    | 2      | ▲     |
| TMUCR0705-2F | 0.7   | 0.05  | 4     | 1.4    | 50    | 2      | ▲     |
| TMUCR0710-2F | 0.7   | 0.10  | 4     | 1.4    | 50    | 2      | ▲     |
| TMUCR0805-2F | 0.8   | 0.05  | 4     | 1.6    | 50    | 2      | ▲     |
| TMUCR0810-2F | 0.8   | 0.10  | 4     | 1.6    | 50    | 2      | ▲     |

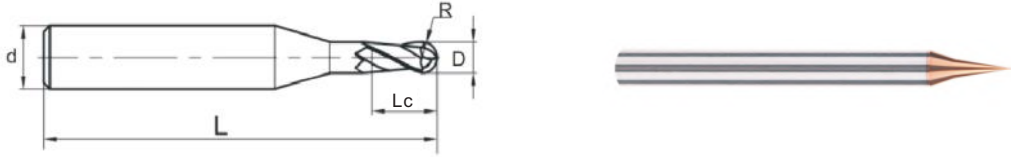
▲ Stock    △ Non-Stock  
Recommended Cutting Conditions B104

|   |
|---|
| TCM45<br>for General Steels                                     |
| TOTIME65<br>for Die Steels<br>Hardened Steels                   |
| TOTIME48<br>for Non-ferrous<br>Metal                            |
| TOTIME3839<br>for General Steels<br>Cast Irons                  |
| TDIA<br>for Graphite  |
| Micro Diameter<br>for Stainless Steel<br>Cast Iron, Alloy Steel |
| ZSTNB/ZSTNR<br>for General Steels<br>Die Steels                 |
| CBN<br>High Hardness<br>Materials                               |

# Micro Ball Nose End Mill



## 2 FLUTES BALL NOSE



|                           |             |                      |                |                 |                  |                   |
|---------------------------|-------------|----------------------|----------------|-----------------|------------------|-------------------|
|                           | 2Flutes     | Cobalt 10%           | HRC 48         | AP Coating      | MG 0.8µm         | Materials Carbide |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                  |                   |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys | Copper Alloys     |
| <HRC35                    | HRC35-45    | HRC45-55             | HRC55-60       |                 |                  |                   |
| ●                         | ●           |                      |                | ●               |                  |                   |

| Order No.  | D(mm) | R(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|------------|-------|-------|-------|--------|-------|--------|-------|
| TMUB020-2F | 0.2   | 0.10  | 4     | 0.4    | 50    | 2      | ▲     |
| TMUB030-2F | 0.3   | 0.15  | 4     | 0.6    | 50    | 2      | ▲     |
| TMUB040-2F | 0.4   | 0.20  | 4     | 0.8    | 50    | 2      | ▲     |
| TMUB050-2F | 0.5   | 0.25  | 4     | 1.0    | 50    | 2      | ▲     |
| TMUB060-2F | 0.6   | 0.30  | 4     | 1.2    | 50    | 2      | ▲     |
| TMUB070-2F | 0.7   | 0.35  | 4     | 1.4    | 50    | 2      | ▲     |
| TMUB080-2F | 0.8   | 0.40  | 4     | 1.6    | 50    | 2      | ▲     |

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions B104

TCM45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-ferrous  
Metal

TOTIME3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for Stainless Steel  
Cast Iron, Alloy Steel

ZSTNB/ZSTNR  
for General Steels  
Die Steels

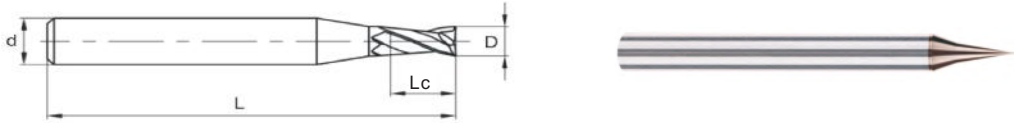
CBN  
High Hardness  
Materials



# Micro Square End Mill



## 2 FLUTES SQUARE



|                           |             |                      |                |                 |                   |               |
|---------------------------|-------------|----------------------|----------------|-----------------|-------------------|---------------|
|                           | Cobalt 10%  | HRC 48               | X6H Coating    | MG 0.8µm        | Materials Carbide |               |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                   |               |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys  | Copper Alloys |
| <HRC35                    | HRC35-45    | HRC48-55             | HRC55-60       |                 |                   |               |
|                           |             | ●                    | ●              |                 |                   |               |

| Order No.  | D(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|------------|-------|-------|--------|-------|--------|-------|
| TMHS010-2F | 0.10  | 4     | 0.2    | 50    | 2      | ▲     |
| TMHS015-2F | 0.15  | 4     | 0.3    | 50    | 2      | ▲     |
| TMHS020-2F | 0.20  | 4     | 0.4    | 50    | 2      | ▲     |
| TMHS025-2F | 0.25  | 4     | 0.5    | 50    | 2      | ▲     |
| TMHS030-2F | 0.30  | 4     | 0.6    | 50    | 2      | ▲     |
| TMHS035-2F | 0.35  | 4     | 0.7    | 50    | 2      | ▲     |
| TMHS040-2F | 0.40  | 4     | 0.8    | 50    | 2      | ▲     |
| TMHS045-2F | 0.45  | 4     | 0.9    | 50    | 2      | ▲     |
| TMHS050-2F | 0.50  | 4     | 1.0    | 50    | 2      | ▲     |
| TMHS060-2F | 0.60  | 4     | 1.2    | 50    | 2      | ▲     |
| TMHS070-2F | 0.70  | 4     | 1.4    | 50    | 2      | ▲     |
| TMHS080-2F | 0.80  | 4     | 1.6    | 50    | 2      | ▲     |
| TMHS090-2F | 0.90  | 4     | 1.8    | 50    | 2      | ▲     |

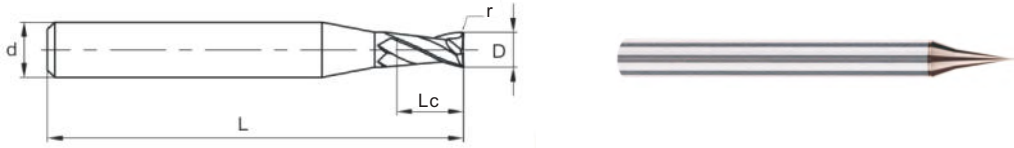
▲ Stock    △ Non-Stock  
Recommended Cutting Conditions B105

|   |
|---|
| TCM45<br>for General Steels                     |
| TOTIME65<br>for Die Steels<br>Hardened Steels   |
| TOTIME48<br>for Non-ferrous<br>Metal            |
| TOTIME3839<br>for General Steels<br>Cast Irons  |
| TDIA<br>for Graphite                            |
| Micro Diameter<br>for Hardend Steel             |
| ZSTNB/ZSTNR<br>for General Steels<br>Die Steels |
| CBN<br>High Hardness<br>Materials               |

# Micro Corner Radius End Mill



## 2 FLUTES CORNER RADIUS



|                           |             |                      |                |                 |                  |                   |
|---------------------------|-------------|----------------------|----------------|-----------------|------------------|-------------------|
|                           | 2Flutes     | Cobalt 10%           | HRC 48         | X6H Coating     | UMG 0.5µm        | Materials Carbide |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                  |                   |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys | Copper Alloys     |
| <HRC35                    | HRC35-45    | HRC48-55             | HRC55-60       |                 |                  |                   |
|                           |             | ●                    | ●              |                 |                  |                   |

| Order No.    | D(mm) | r(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|--------------|-------|-------|-------|--------|-------|--------|-------|
| TMHCR0202-2F | 0.2   | 0.02  | 4     | 0.4    | 50    | 2      | ▲     |
| TMHCR0205-2F | 0.2   | 0.05  | 4     | 0.4    | 50    | 2      | ▲     |
| TMHCR0305-2F | 0.3   | 0.05  | 4     | 0.6    | 50    | 2      | ▲     |
| TMHCR0310-2F | 0.3   | 0.10  | 4     | 0.6    | 50    | 2      | ▲     |
| TMHCR0405-2F | 0.4   | 0.05  | 4     | 0.8    | 50    | 2      | ▲     |
| TMHCR0410-2F | 0.4   | 0.10  | 4     | 0.8    | 50    | 2      | ▲     |
| TMHCR0505-2F | 0.5   | 0.05  | 4     | 1.0    | 50    | 2      | ▲     |
| TMHCR0510-2F | 0.5   | 0.10  | 4     | 1.0    | 50    | 2      | ▲     |
| TMHCR0605-2F | 0.6   | 0.05  | 4     | 1.2    | 50    | 2      | ▲     |
| TMHCR0610-2F | 0.6   | 0.10  | 4     | 1.2    | 50    | 2      | ▲     |
| TMHCR0705-2F | 0.7   | 0.05  | 4     | 1.4    | 50    | 2      | ▲     |
| TMHCR0710-2F | 0.7   | 0.10  | 4     | 1.4    | 50    | 2      | ▲     |
| TMHCR0805-2F | 0.8   | 0.05  | 4     | 1.6    | 50    | 2      | ▲     |
| TMHCR0810-2F | 0.8   | 0.10  | 4     | 1.6    | 50    | 2      | ▲     |

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions B105

TOTIME45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-ferrous  
Metal

TOTIME3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for Hardend Steel

ZSTNB/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials

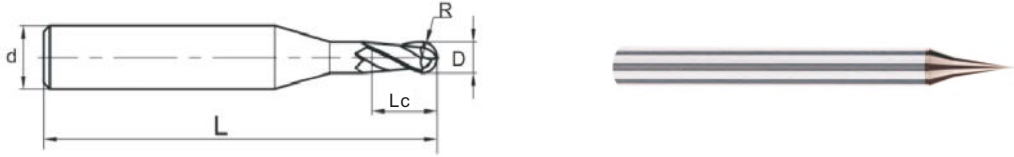




# Micro Ball Nose End Mill



## 2 FLUTES BALL NOSE



|                           |             |                      |                |                 |                  |                   |
|---------------------------|-------------|----------------------|----------------|-----------------|------------------|-------------------|
|                           | 2Flutes     | Cobalt 10%           | HRC 48         | X6H Coating     | UMG 0.5µm        | Materials Carbide |
| ● 1st Recommendation      |             | ○ 2nd Recommendation |                |                 |                  |                   |
| Carbon Steel<br>Cast Iron | Alloy Steel | Hardened Steel       | Hardened Steel | Stainless Steel | Aluminium Alloys | Copper Alloys     |
| <HRC35                    | HRC35-45    | HRC48-55             | HRC55-60       |                 |                  |                   |
|                           |             | ●                    | ●              |                 |                  |                   |

| Order No.  | D(mm) | R(mm) | d(mm) | Lc(mm) | L(mm) | Flutes | Stock |
|------------|-------|-------|-------|--------|-------|--------|-------|
| TMHB020-2F | 0.2   | 0.10  | 4     | 0.4    | 50    | 2      | ▲     |
| TMHB030-2F | 0.3   | 0.15  | 4     | 0.6    | 50    | 2      | ▲     |
| TMHB040-2F | 0.4   | 0.20  | 4     | 0.8    | 50    | 2      | ▲     |
| TMHB050-2F | 0.5   | 0.25  | 4     | 1.0    | 50    | 2      | ▲     |
| TMHB060-2F | 0.6   | 0.30  | 4     | 1.2    | 50    | 2      | ▲     |
| TMHB070-2F | 0.7   | 0.35  | 4     | 1.4    | 50    | 2      | ▲     |
| TMHB080-2F | 0.8   | 0.40  | 4     | 1.6    | 50    | 2      | ▲     |

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions B105

|   |
|---|
| TCM45<br>for General Steels                     |
| TOTIME65<br>for Die Steels<br>Hardened Steels   |
| TOTIME48<br>for Non-ferrous<br>Metal            |
| TOTIME3839<br>for General Steels<br>Cast Irons  |
| TDIA<br>for Graphite                            |
| Micro Diameter<br>for Hardend Steel             |
| ZSTNB/ZSTNR<br>for General Steels<br>Die Steels |
| CBN<br>High Hardness<br>Materials               |

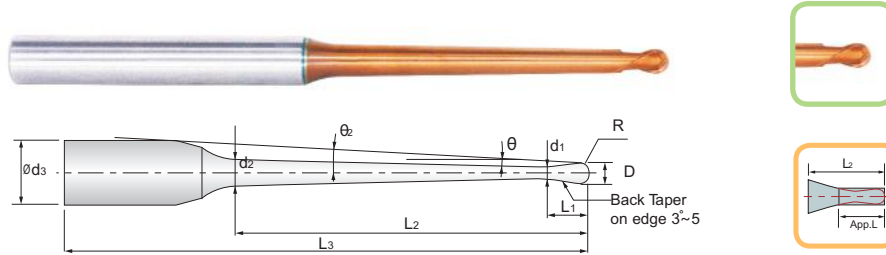


# ZSTNB20... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE

The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.



※R2 or higher is not applied to Back draft type.

| Order No.         | Dimension(mm) |      |      |      |      |      |      |      |      |        | Effective Neck Length |      |      |      |      | Stock |      |
|-------------------|---------------|------|------|------|------|------|------|------|------|--------|-----------------------|------|------|------|------|-------|------|
|                   | R             | D    | L2   | θ    | L1   | d1   | d2   | L3   | d3   | App. L | θ2                    | 0.5° | 1°   | 1.5° | 2°   |       | 3°   |
| ZSTNB2002-1-04    | 0.10          | 0.20 | 1.0  | 0.4  | 0.15 | 0.17 | 0.18 | 50   | 4    | 1.35   | 10.9                  | 1.5  | 1.7  | 1.8  | 2.0  | 2.3   | ▲    |
| ZSTNB2002-1.5-04  |               |      | 1.5  | 0.4  |      |      | 0.19 |      |      | 1.77   | 10.4                  | 2.0  | 2.2  | 2.4  | 2.6  | 2.9   | ▲    |
| ZSTNB2002-2-09    |               |      | 2.0  | 0.9  |      |      | 0.23 |      |      | 1.10   | 10.1                  | x    | 2.8  | 3.1  | 3.4  | 3.9   | ▲    |
| ZSTNB2002-2.5-09  |               |      | 2.5  | 0.9  |      |      | 0.24 |      |      | 1.10   | 9.6                   | x    | 3.3  | 3.7  | 4.0  | 4.5   | ▲    |
| ZSTNB2003-2-04    | 0.15          | 0.30 | 2.0  | 0.4  | 0.25 | 0.28 | 0.29 | 50   | 4    | 2.19   | 10.0                  | 2.5  | 2.8  | 3.0  | 3.2  | 3.5   | ▲    |
| ZSTNB2003-3-09    |               |      | 3.0  | 0.9  |      |      | 0.36 |      |      | 1.20   | 9.3                   | x    | 3.8  | 4.2  | 4.5  | 5.1   | ▲    |
| ZSTNB2003-4-09    |               |      | 4.0  | 0.9  |      |      | 0.39 |      |      | 1.20   | 8.6                   | x    | 4.8  | 5.3  | 5.7  | 6.3   | ▲    |
| ZSTNB2004-2-04    | 0.20          | 0.40 | 2.0  | 0.4  | 0.30 | 0.37 | 0.39 | 50   | 4    | 2.20   | 10.0                  | 2.5  | 2.8  | 3.0  | 3.2  | 3.5   | ▲    |
| ZSTNB2004-3-04    |               |      | 3.0  | 0.4  |      |      | 0.41 |      |      | 2.44   | 9.1                   | 3.6  | 3.9  | 4.1  | 4.4  | 4.8   | ▲    |
| ZSTNB2004-4-04    |               |      | 4.0  | 0.4  |      |      | 0.42 |      |      | 2.44   | 8.4                   | 4.7  | 5.2  | 5.6  | 5.9  | 6.5   | ▲    |
| ZSTNB2004-4-09    |               |      | 4.0  | 0.9  |      |      | 0.49 |      |      | 1.25   | 8.5                   | x    | 4.8  | 5.3  | 5.7  | 6.3   | ▲    |
| ZSTNB2004-5-04    |               |      | 5.0  | 0.4  |      |      | 0.44 |      |      | 2.44   | 7.8                   | 5.7  | 6.3  | 6.7  | 7.1  | 7.7   | ▲    |
| ZSTNB2004-5-09    |               |      | 5.0  | 0.9  |      |      | 0.52 |      |      | 1.25   | 7.9                   | x    | 5.9  | 6.4  | 6.8  | 7.5   | ▲    |
| ZSTNB2005-4-04    | 0.25          | 0.50 | 4.0  | 0.4  | 0.35 | 0.47 | 0.52 | 50   | 4    | 2.49   | 8.4                   | 4.6  | 5.0  | 5.3  | 5.5  | 5.9   | ▲    |
| ZSTNB2005-8-09    |               |      | 8.0  | 0.9  |      |      | 0.71 |      |      | 1.30   | 6.5                   | x    | 8.9  | 9.6  | 10.1 | 10.9  | ▲    |
| ZSTNB2005-12-09   |               |      | 12.0 | 0.9  |      |      | 0.84 |      |      | 1.30   | 5.3                   | x    | 13.0 | 13.9 | 14.5 | 15.4  | ▲    |
| ZSTNB20054-2-04   | 0.27          | 0.54 | 2.0  | 0.4  | 0.37 | 0.52 | 0.54 | 50   | 4    | 1.80   | 10.0                  | 2.3  | 2.5  | 2.7  | 2.8  | 3.0   | ▲    |
| ZSTNB20054-4-04   |               |      | 4.0  |      |      |      | 0.57 |      |      | 1.80   | 8.4                   | 4.5  | 4.9  | 5.2  | 5.5  | 5.9   | ▲    |
| ZSTNB20054-5-04   |               |      | 5.0  |      |      |      | 0.59 |      |      | 1.80   | 7.8                   | 5.5  | 6.0  | 6.3  | 6.6  | 7.1   | ▲    |
| ZSTNB20054-6-04   |               |      | 6.0  |      |      |      | 0.60 |      |      | 1.80   | 7.2                   | 6.7  | 7.3  | 7.8  | 8.2  | 8.8   | ▲    |
| ZSTNB20054-6.5-04 |               |      | 6.5  |      |      |      | 0.61 |      |      | 1.80   | 7.0                   | 7.2  | 7.9  | 8.3  | 8.7  | 9.4   | ▲    |
| ZSTNB20054-7-04   |               |      | 7.0  |      |      |      | 0.61 |      |      | 1.80   | 6.8                   | 7.7  | 8.4  | 8.9  | 9.3  | 10.0  | ▲    |
| ZSTNB2006-2-04    |               |      | 0.30 |      |      |      | 0.60 |      |      | 2.0    | 0.4                   | 0.40 | 0.57 | 0.59 | 50   | 4     | 2.17 |
| ZSTNB2006-4-04    | 4.0           | 0.62 |      | 2.54 | 8.4  | 4.6  |      | 5.0  | 5.2  | 5.5    |                       |      |      | 5.9  |      |       | ▲    |
| ZSTNB2006-6-04    | 6.0           | 0.65 |      | 2.54 | 7.2  | 6.8  |      | 7.4  | 7.8  | 8.2    |                       |      |      | 8.8  |      |       | ▲    |
| ZSTNB2006-6-09    | 6.0           | 0.75 |      | 1.35 | 7.3  | x    |      | 6.9  | 7.5  | 7.9    |                       |      |      | 8.6  |      |       | ▲    |
| ZSTNB2006-8-09    | 8.0           | 0.81 |      | 1.35 | 6.4  | x    |      | 8.9  | 9.6  | 10.1   |                       |      |      | 10.9 |      |       | ▲    |
| ZSTNB2006-10-04   | 10.0          | 0.70 |      | 2.54 | 5.6  | 10.8 |      | 11.7 | 12.2 | 12.7   |                       |      |      | 13.5 |      |       | ▲    |
| ZSTNB2006-10-09   | 10.0          | 0.87 |      | 1.35 | 5.7  | x    |      | 11.0 | 11.8 | 12.3   |                       |      |      | 13.2 |      |       | ▲    |
| ZSTNB2006-12-09   | 12.0          | 0.93 |      | 1.35 | 5.2  | x    |      | 13.0 | 13.9 | 14.5   |                       |      |      | 15.4 |      |       | ▲    |
| ZSTNB2006-15-04   | 15.0          | 0.77 |      | 2.54 | 4.4  | 15.9 |      | 17.0 | 17.6 | 18.2   |                       |      |      | 19.2 |      |       | ▲    |
| ZSTNB2006-15-09   | 15.0          | 0.9  |      | 1.03 | 4.5  | x    |      | 16.1 | 17.1 | 17.7   |                       |      |      | 18.8 |      |       | ▲    |

X No application  
= No interference

※ These tools are manufactured based on order received. Recommended Cutting Conditions B111~B114

▲ Stock △ Non-Stock

TOM45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-Ferrous  
Metal

TOTIME3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

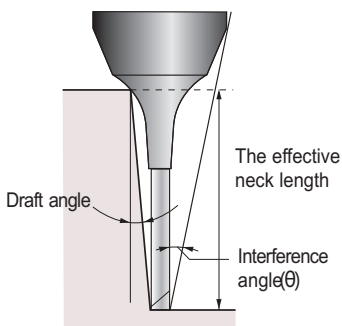
CBN  
High Hardness  
Materials



# ZSTNB20...-...-... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE



- ▶ If the workpiece has draft angle, the interference length will be longer than the L2.
- ▶ Please refer to the effective neck length for the various draft angles
- ▶ In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle  $\theta_2$ ", and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

| Order No.       | Dimension(mm) |     |    |          |      |      |      |     |    |        | Effective Neck Length |      |      |      |      | Stock |    |
|-----------------|---------------|-----|----|----------|------|------|------|-----|----|--------|-----------------------|------|------|------|------|-------|----|
|                 | R             | D   | L2 | $\theta$ | L1   | d1   | d2   | L3  | d3 | App. L | $\theta_2$            | 0.5° | 1°   | 1.5° | 2°   |       | 3° |
| ZSTNB2008-4-04  | 0.40          | 0.8 | 4  | 0.4      | 0.50 | 0.77 | 0.82 | 50  | 4  | 2.64   | 8.3                   | 4.6  | 4.9  | 5.2  | 5.5  | 5.9   | ▲  |
| ZSTNB2008-6-04  |               |     | 6  |          |      |      | 0.85 |     |    | 2.64   | 7.1                   | 6.6  | 7.1  | 7.5  | 7.7  | 8.3   | ▲  |
| ZSTNB2008-8-09  |               |     | 8  | 1.01     |      |      | 1.45 |     |    | 6.3    | x                     | 8.9  | 9.6  | 10.1 | 10.9 | ▲     |    |
| ZSTNB2008-12-09 |               |     | 12 | 1.13     |      |      | 1.45 |     |    | 5.0    | x                     | 13.0 | 13.9 | 14.5 | 15.4 | ▲     |    |
| ZSTNB2008-16-09 |               |     | 16 | 1.26     |      |      | 1.45 |     |    | 4.2    | x                     | 17.1 | 18.1 | 18.8 | 19.9 | ▲     |    |
| ZSTNB2009-4-04  | 0.45          | 0.9 | 4  | 0.4      | 0.60 | 0.86 | 0.91 | 50  | 4  | 3.46   | 8.2                   | 4.5  | 4.7  | 4.9  | 5.1  | 5.4   | ▲  |
| ZSTNB2009-8-04  |               |     | 8  |          |      |      | 0.96 |     |    | 3.46   | 6.1                   | 8.7  | 9.3  | 9.7  | 10.0 | 10.6  | ▲  |
| ZSTNB2009-12-04 |               |     | 12 |          |      |      | 1.02 |     |    | 3.46   | 4.8                   | 12.9 | 13.8 | 14.4 | 14.9 | 15.7  | ▲  |
| ZSTNB2009-16-04 |               |     | 16 |          |      |      | 1.08 |     |    | 3.46   | 4.0                   | 17.0 | 18.0 | 18.7 | 19.3 | 20.5  | ▲  |
| ZSTNB2009-18-04 |               |     | 18 |          |      |      | 1.10 |     |    | 3.46   | 3.7                   | 19.1 | 20.1 | 20.9 | 21.5 | 23.1  | ▲  |
| ZSTNB2009-20-04 |               |     | 20 |          |      |      | 1.13 |     |    | 3.46   | 3.4                   | 21.1 | 22.2 | 23.0 | 23.6 | 25.6  | ▲  |
| ZSTNB2009-22-04 |               |     | 22 |          |      |      | 1.16 |     |    | 3.46   | 3.2                   | 23.1 | 24.3 | 25.1 | 25.8 | 28.2  | ▲  |
| ZSTNB2009-24-04 |               |     | 24 |          |      |      | 1.19 |     |    | 3.46   | 3.0                   | 25.2 | 26.4 | 27.2 | 27.9 | -     | ▲  |
| ZSTNB2010-6-04  | 0.50          | 1   | 6  | 0.4      | 0.80 | 0.94 | 1.01 | 50  | 6  | 5.09   | 8.3                   | 6.8  | 7.2  | 7.5  | 7.8  | 8.3   | ▲  |
| ZSTNB2010-8-04  |               |     | 8  |          |      |      | 1.04 |     |    | 5.09   | 7.5                   | 8.8  | 9.3  | 9.7  | 10.0 | 10.6  | ▲  |
| ZSTNB2010-10-04 |               |     | 10 |          |      |      | 1.07 |     |    | 5.09   | 6.8                   | 11.0 | 11.7 | 12.3 | 12.7 | 13.5  | ▲  |
| ZSTNB2010-10-09 |               |     | 10 | 1.23     |      |      | 2.70 | 6.9 |    | x      | 11.2                  | 11.9 | 12.4 | 13.2 | ▲    |       |    |
| ZSTNB2010-15-09 |               |     | 15 | 1.39     |      |      | 2.70 | 5.7 |    | x      | 16.2                  | 17.1 | 17.8 | 18.8 | ▲    |       |    |
| ZSTNB2010-20-04 |               |     | 20 | 1.21     |      |      | 5.09 | 4.7 |    | 21.2   | 22.3                  | 23.0 | 23.6 | 25.7 | ▲    |       |    |
| ZSTNB2010-20-09 |               |     | 20 | 1.54     |      |      | 2.70 | 4.8 |    | x      | 21.3                  | 22.4 | 23.1 | 24.6 | ▲    |       |    |
| ZSTNB2010-25-09 |               |     | 25 | 1.70     |      |      | 2.70 | 4.2 |    | x      | 26.4                  | 27.6 | 28.4 | 30.8 | ▲    |       |    |
| ZSTNB2010-30-04 |               |     | 30 | 1.35     |      |      | 5.09 | 3.6 |    | 31.3   | 32.7                  | 33.6 | 34.8 | 38.5 | ▲    |       |    |
| ZSTNB2010-30-09 |               |     | 30 | 1.86     |      |      | 2.70 | 3.7 |    | x      | 31.4                  | 32.8 | 33.7 | 36.9 | ▲    |       |    |
| ZSTNB2010-35-09 |               |     | 35 | 2.02     |      |      | 2.70 | 3.3 |    | x      | 36.5                  | 38.0 | 39.0 | 43.1 | ▲    |       |    |
| ZSTNB2010-40-09 |               |     | 40 | 2.17     |      |      | 2.70 | 3.0 |    | x      | 41.6                  | 43.2 | 44.4 | -    | ▲    |       |    |
| ZSTNB2010-50-09 |               |     | 50 | 2.49     |      |      | 2.70 | 2.5 |    | x      | 51.7                  | 53.5 | 55.5 | -    | ▲    |       |    |
| ZSTNB2010-60-09 |               |     | 60 | 2.80     |      |      | 2.70 | 2.2 |    | x      | 61.8                  | 63.8 | 66.6 | -    | ▲    |       |    |
| ZSTNB2010-70-09 |               |     | 70 | 3.11     |      |      | 2.70 | 1.9 |    | x      | 71.9                  | 74.0 | -    | -    | ▲    |       |    |
| ZSTNB2015-8-04  | 0.75          | 1.5 | 8  | 0.4      | 1.35 | 1.42 | 1.51 | 55  | 6  | 7.07   | 7.3                   | 8.9  | 9.4  | 9.7  | 10.0 | 10.6  | ▲  |
| ZSTNB2015-10-04 |               |     | 10 |          |      |      | 1.54 |     |    | 7.07   | 6.6                   | 10.9 | 11.5 | 11.9 | 12.2 | 12.9  | ▲  |

X No application  
- No interference

※ These tools are manufactured based on order received.

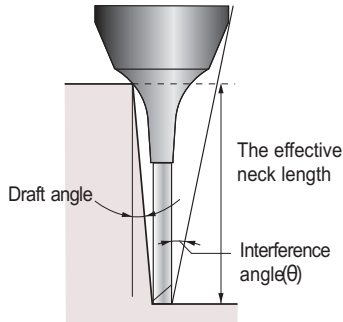
▲ Stock △ Non-Stock  
Recommended Cutting Conditions B111~B114



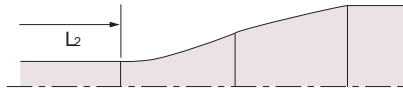
# ZSTNB20...-...-... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE



- ▶ If the workpiece has draft angle, the interference length will be longer than the L2.
- ▶ Please refer to the effective neck length for the various draft angles
- ▶ In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle θ2", and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

| Order No.       | Dimension(mm) |      |     |      |      |      |      |      |      |        | Effective Neck Length |      |      |       |      | Stock |      |      |      |      |      |      |
|-----------------|---------------|------|-----|------|------|------|------|------|------|--------|-----------------------|------|------|-------|------|-------|------|------|------|------|------|------|
|                 | R             | D    | L2  | θ    | L1   | d1   | d2   | L3   | d3   | App. L | θ2                    | 0.5° | 1°   | 1.5°  | 2°   |       | 3°   |      |      |      |      |      |
| ZSTNB2015-12-04 | 0.75          | 1.5  | 12  | 0.4  | 1.35 | 1.42 | 1.57 | 55   | 6    | 7.07   | 6.0                   | 13.0 | 13.6 | 14.0  | 14.4 | 15.4  | ▲    |      |      |      |      |      |
| ZSTNB2015-15-09 |               |      | 15  | 0.9  |      |      | 1.85 | 60   |      | 3.89   | 5.4                   | x    | 16.4 | 17.2  | 17.8 | 18.8  | ▲    |      |      |      |      |      |
| ZSTNB2015-20-09 |               |      | 20  |      |      |      | 2.01 | 65   |      | 3.89   | 4.5                   | x    | 21.4 | 22.4  | 23.2 | 24.7  | ▲    |      |      |      |      |      |
| ZSTNB2015-30-09 |               |      | 30  |      |      |      | 2.32 | 75   |      | 3.89   | 3.4                   | x    | 31.5 | 32.9  | 33.7 | 37.0  | ▲    |      |      |      |      |      |
| ZSTNB2018-4-04  | 0.9           | 1.8  | 4   | 0.4  | 1.6  | 1.73 | 1.76 | 50   | 6    | 4.38   | 9.2                   | 4.6  | 4.8  | 4.9   | 5.1  | 5.4   | ▲    |      |      |      |      |      |
| ZSTNB2018-8-04  |               |      | 8   |      |      |      | 1.82 |      |      | 6.61   | 7.1                   | 8.6  | 9.0  | 9.2   | 9.4  | 10.2  | ▲    |      |      |      |      |      |
| ZSTNB2018-12-04 |               |      | 12  |      |      |      | 1.88 |      |      | 6.61   | 5.8                   | 12.9 | 13.5 | 14.0  | 14.4 | 15.4  | ▲    |      |      |      |      |      |
| ZSTNB2018-16-04 |               |      | 16  |      |      |      | 1.93 | 6.61 |      | 4.9    | 17.0                  | 17.7 | 18.3 | 18.7  | 20.5 | ▲     |      |      |      |      |      |      |
| ZSTNB2018-20-04 |               |      | 20  |      |      |      | 1.99 | 6.61 |      | 4.3    | 21.2                  | 22.3 | 23.0 | 23.6  | 25.6 | ▲     |      |      |      |      |      |      |
| ZSTNB2018-24-04 |               |      | 24  |      |      |      | 2.04 | 6.61 |      | 3.8    | 25.3                  | 26.5 | 27.3 | 27.9  | 30.8 | ▲     |      |      |      |      |      |      |
| ZSTNB2018-28-04 |               |      | 28  |      |      |      | 2.10 | 6.61 |      | 3.4    | 29.4                  | 30.6 | 31.5 | 32.4  | 35.9 | ▲     |      |      |      |      |      |      |
| ZSTNB2018-32-04 |               |      | 32  |      |      |      | 2.15 | 6.61 |      | 3.0    | 33.4                  | 34.8 | 35.7 | 37.1  | -    | ▲     |      |      |      |      |      |      |
| ZSTNB2018-36-04 |               |      | 36  |      |      |      | 2.21 | 6.61 |      | 2.8    | 37.5                  | 38.9 | 39.9 | 41.7  | -    | ▲     |      |      |      |      |      |      |
| ZSTNB2018-38-04 |               |      | 38  |      |      |      | 2.24 | 6.61 |      | 2.7    | 39.5                  | 41.0 | 42.0 | 44.0  | -    | ▲     |      |      |      |      |      |      |
| ZSTNB2018-40-04 |               |      | 40  |      |      |      | 2.27 | 6.61 |      | 2.6    | 41.5                  | 43.1 | 44.2 | 46.3  | -    | ▲     |      |      |      |      |      |      |
| ZSTNB2020-8-04  |               |      | 1.0 |      |      |      | 2.0  | 8    |      | 0.4    | 1.7                   | 1.92 | 2.01 | 50    | 6    | 7.42  | 7.0  | 8.7  | 9.0  | 9.2  | 9.5  | 10.2 |
| ZSTNB2020-12-04 | 12            | 2.06 |     | 55   | 7.42 | 5.7  |      | 13.0 | 13.6 |        |                       |      | 14.0 | 14.4  |      | 15.4  | ▲    |      |      |      |      |      |
| ZSTNB2020-16-04 | 16            | 2.12 |     | 60   | 7.42 | 4.8  |      | 17.0 | 17.7 |        |                       |      | 18.3 | 18.7  |      | 20.5  | ▲    |      |      |      |      |      |
| ZSTNB2020-20-04 | 20            | 2.18 |     | 7.42 | 4.1  | 21.3 |      | 22.3 | 23.0 |        |                       |      | 23.6 | 25.6  |      | ▲     |      |      |      |      |      |      |
| ZSTNB2020-20-09 | 20            | 2.50 |     | 65   | 4.24 | 4.2  |      | x    | 21.4 | 22.4   |                       |      | 23.2 | 24.6  |      | ▲     |      |      |      |      |      |      |
| ZSTNB2020-25-09 | 25            | 2.65 |     | 4.24 | 3.6  | x    |      | 26.5 | 27.7 | 28.5   |                       |      | 30.8 | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2020-30-04 | 30            | 2.32 |     | 7.42 | 3.1  | 31.4 |      | 32.7 | 33.6 | 34.8   |                       |      | 38.5 | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2020-30-09 | 30            | 2.81 |     | 4.24 | 3.2  | x    |      | 31.6 | 32.9 | 33.7   |                       |      | 36.9 | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2020-35-09 | 35            | 2.97 |     | 4.24 | 2.8  | x    |      | 36.6 | 38.0 | 39.0   |                       |      | -    | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2020-40-04 | 40            | 2.46 |     | 7.42 | 2.5  | 41.5 |      | 43.1 | 44.2 | 46.3   |                       |      | -    | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2020-40-09 | 40            | 3.12 |     | 4.24 | 2.6  | x    |      | 41.7 | 43.2 | 44.5   |                       |      | -    | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2020-50-09 | 50            | 3.44 |     | 4.24 | 2.1  | x    |      | 51.8 | 53.5 | 55.5   |                       |      | -    | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2020-60-09 | 60            | 3.75 |     | 4.24 | 1.8  | x    |      | 61.9 | 63.8 | -      |                       |      | -    | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2020-70-09 | 70            | 4.07 |     | 4.24 | 1.6  | x    |      | 72.0 | 74.1 | -      |                       |      | -    | ▲     |      |       |      |      |      |      |      |      |
| ZSTNB2030-8-04  | 1.5           | 3.0  |     | 8    | 0.4  | 2.5  |      | 2.86 | 2.94 | 50     |                       |      | 6    | 8.50  |      | 6.3   | 8.8  | 9.1  | 9.3  | 9.5  | 10.3 | ▲    |
| ZSTNB2030-16-04 |               |      |     | 16   |      |      |      |      | 3.05 | 55     |                       |      |      | 12.52 |      | 4.1   | 17.2 | 17.8 | 18.3 | 18.7 | 20.6 | ▲    |

X No application  
- No interference

▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions B111~B114

TGM45  
for General Steels

TOTIME65  
for Die Steels  
Hard end Steels

TOTIME48  
for Non-Ferrous  
Metal

TOTIME3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

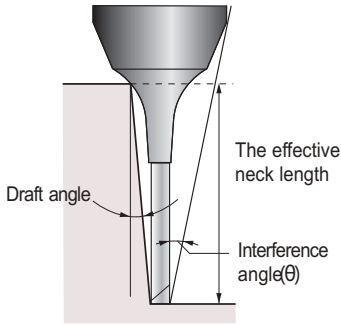
CBN  
High Hardness  
Materials



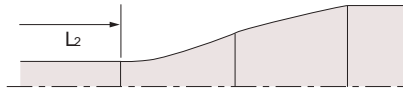
# ZSTNB20...-...-... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE



- ▶ If the workpiece has draft angle, the interference length will be longer than the L2.
- ▶ Please refer to the effective neck length for the various draft angles
- ▶ In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle θ2", and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

| Order No.       | Dimension(mm) |      |       |      |      |       |       |       |      |        | Effective Neck Length |      |       |      |       | Stock |      |      |      |       |      |   |
|-----------------|---------------|------|-------|------|------|-------|-------|-------|------|--------|-----------------------|------|-------|------|-------|-------|------|------|------|-------|------|---|
|                 | R             | D    | L2    | θ    | L1   | d1    | d2    | L3    | d3   | App. L | θ2                    | 0.5° | 1°    | 1.5° | 2°    |       | 3°   |      |      |       |      |   |
| ZSTNB2030-20-04 | 1.5           | 3    | 20    | 0.4  | 2.5  | 2.86  | 3.10  | 60    | 6    | 12.52  | 3.4                   | 21.2 | 22.0  | 22.6 | 23.3  | 25.7  | ▲    |      |      |       |      |   |
| ZSTNB2030-30-04 |               |      | 3.24  |      |      |       | 70    |       |      | 12.52  | 2.5                   | 31.6 | 32.8  | 33.7 | 34.9  | -     | ▲    |      |      |       |      |   |
| ZSTNB2030-30-09 |               |      | 3.72  |      |      |       |       | 6.95  |      | 2.6    | x                     | 31.8 | 33.0  | 33.8 | -     | ▲     |      |      |      |       |      |   |
| ZSTNB2030-40-04 |               |      | 40    | 0.4  |      |       | 3.38  | 80    |      | 12.52  | 2.0                   | 41.7 | 43.2  | 44.3 | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2030-40-09 |               |      | 40    | 0.9  |      |       | 4.04  |       |      | 6.95   | 2.0                   | x    | 41.9  | 43.3 | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2030-50-09 |               |      | 50    |      |      |       | 4.35  | 90    |      | 6.95   | 1.7                   | x    | 52.0  | 53.6 | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2030-60-09 |               |      | 60    |      |      |       | 4.67  | 100   |      | 6.95   | 1.4                   | x    | 62.1  | -    | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2030-70-09 |               |      | 70    | 4.98 |      |       | 110   | 6.95  |      | 1.2    | x                     | 72.1 | -     | -    | -     | ▲     |      |      |      |       |      |   |
| ZSTNB2040-20-10 |               |      | 2.0   | 4    |      |       | 20    | 1.0   |      | 8.0    | 3.86                  | 4.28 | 70    | 8    | 12.01 | 5.0   | 20.5 | 21.6 | 22.3 | 22.8  | 23.5 | ▲ |
| ZSTNB2040-30-10 |               |      |       |      |      |       | 4.63  |       |      |        |                       | 80   | 12.01 |      | 3.51  | 22.0  | 31.6 | 32.5 | 33.2 | 34.16 | ▲    |   |
| ZSTNB2040-40-10 | 40            | 4.98 |       |      | 90   | 12.01 | 2.7   |       | 22.0 |        |                       | 42.0 | 43.4  |      | 44.3  | -     | ▲    |      |      |       |      |   |
| ZSTNB2040-50-10 | 50            | 5.33 |       |      | 100  | 12.01 | 2.2   |       | 22.0 |        |                       | 52.0 | 53.6  |      | 54.7  | -     | ▲    |      |      |       |      |   |
| ZSTNB2040-60-10 | 60            | 5.68 |       |      | 110  | 12.01 | 1.9   |       | 22.0 |        |                       | 62.0 | 63.8  |      | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2050-30-10 | 2.5           | 5    | 30    | 1.0  | 10.0 | 4.86  | 5.56  | 80    | 8    | 14.01  | 2.8                   | 25.5 | 31.7  | 32.6 | 33.2  | -     | ▲    |      |      |       |      |   |
| ZSTNB2050-40-10 |               |      | 5.91  |      |      |       | 90    | 14.01 |      | 2.1    | 25.5                  | 41.7 | 42.8  | 43.5 | -     | ▲     |      |      |      |       |      |   |
| ZSTNB2050-60-10 |               |      | 6.61  |      |      |       | 110   | 14.01 |      | 1.5    | 25.5                  | 62.1 | -     | -    | -     | ▲     |      |      |      |       |      |   |
| ZSTNB2060-30-10 | 3.0           | 6    | 30    | 1.0  | 12.0 | 5.86  | 6.49  | 80    | 8    | 16.01  | 1.9                   | 29.0 | 31.8  | 32.6 | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2060-40-10 |               |      | 6.84  |      |      |       | 90    | 16.01 |      | 1.5    | 29.0                  | 41.8 | -     | -    | -     | ▲     |      |      |      |       |      |   |
| ZSTNB2060-50-10 |               |      | 50    |      |      |       | 7.19  | 100   |      | 16.01  | 1.2                   | 29.0 | 51.8  | -    | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2060-60-10 |               |      | 60    |      |      |       | 7.54  | 110   |      | 16.01  | 1.9                   | 29.0 | 62.2  | 63.9 | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2060-70-10 |               |      | 70    |      |      |       | 7.89  | 120   |      | 16.01  | 1.7                   | 29.0 | 72.2  | 74.1 | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2060-80-10 |               |      | 80    |      |      |       | 8.23  | 130   |      | 16.01  | 1.5                   | 29.0 | 82.2  | -    | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2080-50-10 | 4.0           | 8    | 50    | 1.0  | 14.0 | 7.86  | 9.12  | 110   | 10   | 18.01  | 1.2                   | 32.0 | 51.9  | -    | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2080-60-10 |               |      | 9.47  |      |      |       | 120   | 18.01 |      | 1.0    | 32.0                  | -    | -     | -    | -     | ▲     |      |      |      |       |      |   |
| ZSTNB2080-70-10 |               |      | 9.82  |      |      |       | 130   | 18.01 |      | 0.9    | 32.0                  | -    | -     | -    | -     | ▲     |      |      |      |       |      |   |
| ZSTNB2080-80-10 |               |      | 10.16 |      |      |       | 140   | 18.01 |      | 1.5    | 32.0                  | 82.3 | -     | -    | -     | ▲     |      |      |      |       |      |   |
| ZSTNB2100-60-10 | 5.0           | 10   | 60    | 1.0  | 18.0 | 9.86  | 11.33 | 130   | 12   | 22.01  | 1.1                   | 39.0 | 62.1  | -    | -     | -     | ▲    |      |      |       |      |   |
| ZSTNB2100-75-10 |               |      | 11.85 |      |      |       | 140   | 22.01 |      | 0.9    | 39.0                  | -    | -     | -    | -     | ▲     |      |      |      |       |      |   |

X No application  
- No interference

※ These tools are manufactured based on order received.

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B111~B114

### ■ Applicable Working Material

| Carbon Steels (S45C, S55C...)<br>~ HB225 | Alloy Steels (SCM, SK...)<br>HB225~325 | Prehardened Steels (NAK...)<br>HRc30~50 | Hardened Steels |              | Copper | Graphite | Cast Iron FCD400, 500~ | Aluminum | Stainless Sheets |
|--|--|---|-----------------|--------------|--------|----------|------------------------|----------|------------------|
|  |  |   | ~Hrc55 SKD61    | ~Hrc55 SKD11 |        |          |                        |          |                  |
| ○  | ○                                      | ○                                       | ◎               | ◎            | ○      |          |                        |          |                  |

○: General Application ◎: The most suitable Application

### ■ Tolerance

| Diameter | Radius | Shank Dia. |
|----------|--------|------------|
| up to 6  | ±0.005 | h6         |
| over 6   | ±0.01  |            |

※ Items can be changed for quality improvement without notice.

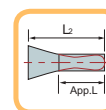
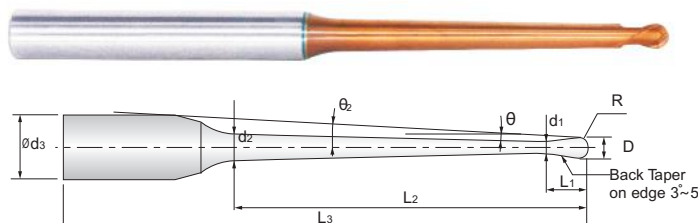


# ZSTNB30... SERIES



## 3 FLUTE, TAPER NECK BACK DRAFT TYPE

The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.



※R2 or higher is not applied to Back draft type.

| Order No.       | Dimension(mm) |   |    |      |      |      |      |       |    |        | Effective Neck Length |      |      |      |      | Stock |    |
|-----------------|---------------|---|----|------|------|------|------|-------|----|--------|-----------------------|------|------|------|------|-------|----|
|                 | R             | D | L2 | θ    | L1   | d1   | d2   | L3    | d3 | App. L | θ2                    | 0.5° | 1°   | 1.5° | 2°   |       | 3° |
| ZSTNB3020-8-04  | 1.0           | 2 | 8  | 0.4  | 1.7  | 1.92 | 2.01 | 50    | 6  | 7.42   | 7.0                   | 8.7  | 9.0  | 9.2  | 9.5  | 10.2  | ▲  |
| ZSTNB3020-12-04 |               |   | 12 |      |      |      | 2.06 | 55    |    | 7.42   | 5.7                   | 13.0 | 13.6 | 14.0 | 14.4 | 15.4  | ▲  |
| ZSTNB3020-16-04 |               |   | 16 |      |      |      | 2.12 | 60    |    | 7.42   | 4.8                   | 17.0 | 17.7 | 18.3 | 18.7 | 20.5  | ▲  |
| ZSTNB3020-20-04 |               |   | 20 |      |      |      | 2.18 | 65    |    | 7.42   | 4.1                   | 21.3 | 22.3 | 23.0 | 23.6 | 25.6  | ▲  |
| ZSTNB3020-20-09 |               |   | 20 | 2.50 |      |      | 0.9  | 4.24  |    | 4.2    | x                     | 21.4 | 22.4 | 23.2 | 24.6 | ▲     |    |
| ZSTNB3020-25-09 |               |   | 25 | 2.65 |      |      |      | 4.24  |    | 3.6    | x                     | 26.5 | 27.7 | 28.5 | 30.8 | ▲     |    |
| ZSTNB3020-30-04 |               |   | 30 | 2.32 |      |      | 0.4  | 7.42  |    | 3.1    | 31.4                  | 32.7 | 33.6 | 34.8 | 38.5 | ▲     |    |
| ZSTNB3020-30-09 |               |   | 30 | 2.81 |      |      |      | 70    |    | 4.24   | 3.2                   | x    | 31.6 | 32.9 | 33.7 | 36.9  | ▲  |
| ZSTNB3020-35-09 |               |   | 35 | 2.97 |      |      | 0.9  | 4.24  |    | 2.8    | x                     | 36.6 | 38.0 | 39.0 | -    | ▲     |    |
| ZSTNB3020-40-04 |               |   | 40 | 2.46 |      |      |      | 80    |    | 7.42   | 2.5                   | 41.5 | 43.1 | 44.2 | 46.3 | -     | ▲  |
| ZSTNB3020-40-09 |               |   | 40 | 3.12 |      |      | 0.9  | 4.24  |    | 2.6    | x                     | 41.7 | 43.2 | 44.5 | -    | ▲     |    |
| ZSTNB3020-50-09 |               |   | 50 | 3.44 |      |      |      | 90    |    | 4.24   | 2.1                   | x    | 51.8 | 53.5 | 55.5 | -     | ▲  |
| ZSTNB3020-60-09 |               |   | 60 | 3.75 |      |      | 0.9  | 4.24  |    | 1.8    | x                     | 61.9 | 63.8 | -    | -    | ▲     |    |
| ZSTNB3020-70-09 |               |   | 70 | 4.07 |      |      |      | 110   |    | 4.24   | 1.6                   | x    | 72.0 | 74.1 | -    | -     | ▲  |
| ZSTNB3030-8-04  | 1.5           | 3 | 8  | 0.4  | 2.5  | 2.86 | 2.94 | 50    | 6  | 8.50   | 6.3                   | 8.8  | 9.1  | 9.3  | 9.5  | 10.3  | ▲  |
| ZSTNB3030-16-04 |               |   | 16 |      |      |      | 3.05 | 55    |    | 12.52  | 4.1                   | 17.2 | 17.8 | 18.3 | 18.7 | 20.6  | ▲  |
| ZSTNB3030-20-04 |               |   | 20 |      |      |      | 3.10 | 60    |    | 12.52  | 3.4                   | 21.2 | 22.0 | 22.6 | 23.3 | 25.7  | ▲  |
| ZSTNB3030-30-04 |               |   | 30 |      |      |      | 3.24 | 70    |    | 12.52  | 2.5                   | 31.6 | 32.8 | 33.7 | 34.9 | -     | ▲  |
| ZSTNB3030-30-09 |               |   | 30 | 3.72 |      |      | 6.95 |       |    | 2.6    | x                     | 31.8 | 33.0 | 33.8 | -    | ▲     |    |
| ZSTNB3030-40-04 |               |   | 40 | 3.38 |      |      | 80   | 12.52 |    | 2.0    | 41.7                  | 43.2 | 44.3 | -    | -    | ▲     |    |
| ZSTNB3030-40-09 |               |   | 40 | 4.04 |      |      |      | 6.95  |    | 2.0    | x                     | 41.9 | 43.3 | -    | -    | ▲     |    |
| ZSTNB3030-50-09 |               |   | 50 | 4.35 |      |      | 0.9  | 6.95  |    | 1.7    | x                     | 52.0 | 53.6 | -    | -    | ▲     |    |
| ZSTNB3030-60-09 |               |   | 60 | 4.67 |      |      |      | 100   |    | 6.95   | 1.4                   | x    | 62.1 | -    | -    | -     | ▲  |
| ZSTNB3030-70-09 |               |   | 70 | 4.98 |      |      | 110  | 6.95  |    | 1.2    | x                     | 72.1 | -    | -    | -    | ▲     |    |
| ZSTNB3040-20-10 | 2.0           | 4 | 20 | 1.0  | 8.0  | 3.86 | 4.28 | 70    | 8  | 12.01  | 5.0                   | 20.5 | 21.6 | 22.3 | 22.8 | 23.5  | ▲  |
| ZSTNB3040-30-10 |               |   | 30 |      |      |      | 4.63 | 80    |    | 12.01  | 3.6                   | 22.0 | 31.6 | 32.5 | 33.2 | 34.1  | ▲  |
| ZSTNB3040-40-10 |               |   | 40 |      |      |      | 4.98 | 90    |    | 12.01  | 2.7                   | 22.0 | 42.0 | 43.4 | 44.3 | -     | ▲  |
| ZSTNB3040-50-10 |               |   | 50 |      |      |      | 5.33 | 100   |    | 12.01  | 2.2                   | 22.0 | 52.0 | 53.6 | 54.7 | -     | ▲  |
| ZSTNB3040-60-10 |               |   | 60 |      |      |      | 5.68 | 110   |    | 12.01  | 1.9                   | 22.0 | 62.0 | 63.8 | -    | -     | ▲  |
| ZSTNB3050-30-10 | 2.5           | 5 | 30 | 1.0  | 10.0 | 4.86 | 5.56 | 80    | 8  | 14.01  | 2.8                   | 25.5 | 31.7 | 32.6 | 33.2 | -     | ▲  |
| ZSTNB3050-40-10 |               |   | 40 |      |      |      | 5.91 | 90    |    | 14.01  | 2.1                   | 25.5 | 41.7 | 42.8 | 43.5 | -     | ▲  |
| ZSTNB3050-60-10 |               |   | 60 |      |      |      | 6.61 | 110   |    | 12.52  | 1.5                   | 25.5 | 62.1 | -    | -    | -     | ▲  |

X No application  
- No interference

※ These tools are manufactured based on order received.

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B111~B114

TCM45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-Ferro us  
Metal

TOTIME3899  
for General Steels  
Cast Irons

TD1A  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials

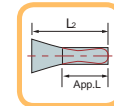
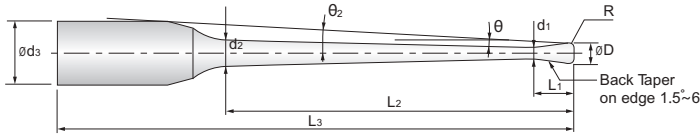


# ZSTNR... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE

The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.



※R2 or higher is not applied to Back draft type.

| Order No.         | Dimension(mm) |      |      |      |      |      |      |    |      |        | Effective Neck Length |      |      |      |      | Stock |      |
|-------------------|---------------|------|------|------|------|------|------|----|------|--------|-----------------------|------|------|------|------|-------|------|
|                   | D             | R    | L2   | θ    | L1   | d1   | d2   | L3 | d3   | App. L | θ2                    | 0.5° | 1°   | 1.5° | 2°   |       | 3°   |
| ZSTNR2002-2-09005 | 0.2           | 0.05 | 2    | 0.9  | 0.15 | 0.17 | 0.23 | 50 | 4    | 1.10   | 10.0                  | x    | 2.8  | 3.1  | 3.4  | 3.9   | ▲    |
| ZSTNR2004-4-09005 | 0.4           | 0.05 | 4    | 0.9  | 0.30 | 0.37 | 0.49 | 50 | 4    | 1.25   | 8.4                   | x    | 4.9  | 5.3  | 5.7  | 6.3   | ▲    |
| ZSTNR2004-5-09005 |               |      | 5    | 0.9  |      |      | 0.52 |    |      | 1.25   | 7.8                   | x    | 5.9  | 6.4  | 6.8  | 7.5   | ▲    |
| ZSTNR2004-4-0901  |               | 0.10 | 4    | 0.9  |      |      | 0.49 |    |      | 1.25   | 8.5                   | x    | 4.9  | 5.3  | 5.7  | 6.3   | ▲    |
| ZSTNR2004-5-0901  |               |      | 5    | 0.9  |      |      | 0.52 |    |      | 1.25   | 7.9                   | x    | 5.9  | 6.4  | 6.8  | 7.5   | ▲    |
| ZSTNR2005-5-0901  |               |      | 0.5  | 0.10 |      |      | 5    |    |      | 0.9    | 0.35                  | 0.47 | 0.62 | 50   | 4    | 1.30  | 7.8  |
| ZSTNR2005-8-0901  | 8             | 0.9  |      |      | 0.71 | 1.30 | 6.4  | x  | 9.0  | 9.7    |                       |      | 10.2 |      |      | 11.0  | ▲    |
| ZSTNR2005-10-0901 | 10            | 0.9  |      |      | 0.77 | 1.30 | 5.8  | x  | 11.0 | 11.8   |                       |      | 12.4 |      |      | 13.2  | ▲    |
| ZSTNR2006-12-0901 | 0.6           | 0.10 | 12   | 0.9  | 0.40 | 0.57 | 0.93 | 55 | 4    | 1.35   | 5.1                   | x    | 13.0 | 13.9 | 14.5 | 15.5  | ▲    |
| ZSTNR2006-15-0901 |               |      | 15   | 0.9  |      |      | 1.03 |    |      | 1.35   | 4.5                   | x    | 16.1 | 17.1 | 17.8 | 18.8  | ▲    |
| ZSTNR2008-6-0402  | 0.8           | 0.20 | 6    | 0.4  | 0.50 | 0.77 | 0.85 | 50 | 4    | 2.64   | 7.0                   | 6.6  | 7.1  | 7.5  | 7.8  | 8.3   | ▲    |
| ZSTNR2008-12-0902 |               |      | 12   | 0.9  |      |      | 1.13 |    |      | 1.45   | 5.0                   | x    | 13.0 | 13.9 | 14.5 | 15.5  | ▲    |
| ZSTNR2010-8-0402  | 1.0           | 0.20 | 8    | 0.4  | 0.80 | 0.94 | 1.04 | 55 | 6    | 5.09   | 7.4                   | 8.8  | 9.3  | 9.7  | 10.1 | 10.6  | ▲    |
| ZSTNR2010-10-0902 |               |      | 10   | 0.9  |      |      | 1.23 |    |      | 5.09   | 6.8                   | x    | 11.2 | 11.9 | 12.4 | 13.3  | ▲    |
| ZSTNR2010-15-0902 |               |      | 15   | 0.9  |      |      | 1.39 |    |      | 2.70   | 5.6                   | x    | 16.3 | 17.2 | 17.8 | 18.8  | ▲    |
| ZSTNR2010-20-0902 |               |      | 20   | 0.9  |      |      | 1.54 |    |      | 2.70   | 4.8                   | x    | 21.3 | 22.4 | 23.2 | 24.7  | ▲    |
| ZSTNR2010-25-0902 |               |      | 25   | 0.9  |      |      | 1.70 |    |      | 2.70   | 4.1                   | x    | 26.4 | 27.6 | 28.5 | 30.9  | ▲    |
| ZSTNR2010-30-0902 |               |      | 30   | 0.9  |      |      | 1.86 |    |      | 2.70   | 3.7                   | x    | 31.5 | 32.8 | 33.7 | 37.0  | ▲    |
| ZSTNR2010-35-0902 | 0.30          | 0.20 | 35   | 0.9  | 0.80 | 0.94 | 2.02 | 60 | 6    | 2.70   | 3.3                   | x    | 36.5 | 38.0 | 39.0 | 43.2  | ▲    |
| ZSTNR2010-8-0403  |               |      | 8    | 0.4  |      |      | 1.04 |    |      | 2.70   | 7.4                   | 8.8  | 9.3  | 9.7  | 10.0 | 10.6  | ▲    |
| ZSTNR2010-15-0903 |               |      | 15   | 0.9  |      |      | 1.39 |    |      | 2.70   | 5.6                   | x    | 16.3 | 17.2 | 17.8 | 18.8  | ▲    |
| ZSTNR2010-25-0903 |               |      | 25   | 0.9  |      |      | 1.70 |    |      | 2.70   | 4.2                   | x    | 26.4 | 27.6 | 28.5 | 30.8  | ▲    |
| ZSTNR2010-30-0903 |               |      | 30   | 0.9  |      |      | 1.86 |    |      | 2.70   | 3.7                   | x    | 31.5 | 32.8 | 33.7 | 37.0  | ▲    |
| ZSTNR2015-10-0402 | 1.5           | 0.20 | 10   | 0.4  | 1.35 | 1.42 | 1.54 | 55 | 6    | 7.07   | 6.4                   | 11.0 | 11.5 | 11.9 | 12.3 | 13.0  | ▲    |
| ZSTNR2015-15-0902 |               |      | 15   | 0.9  |      |      | 1.85 |    |      | 7.07   | 5.3                   | x    | 16.4 | 17.3 | 17.9 | 18.9  | ▲    |
| ZSTNR2015-20-0902 |               |      | 20   | 0.9  |      |      | 2.01 |    |      | 3.89   | 4.5                   | x    | 21.5 | 22.5 | 23.2 | 24.9  | ▲    |
| ZSTNR2015-25-0902 |               |      | 25   | 0.9  |      |      | 2.16 |    |      | 3.89   | 3.9                   | x    | 26.6 | 27.7 | 28.5 | 31.0  | ▲    |
| ZSTNR2015-30-0902 |               |      | 30   | 0.9  |      |      | 2.32 |    |      | 3.89   | 3.4                   | x    | 31.6 | 32.9 | 33.8 | 37.1  | ▲    |
| ZSTNR2015-10-0403 |               |      | 0.30 | 10   |      |      | 0.4  |    |      | 1.54   | 55                    | 6    | 3.89 | 6.4  | 11.0 | 11.5  | 11.9 |

X No application  
- No interference

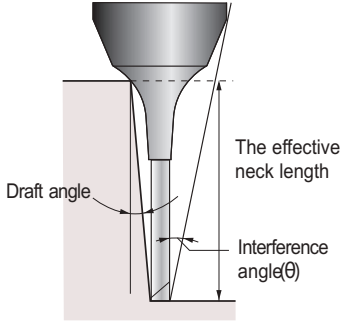
▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions B115~B116



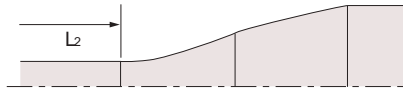
**ZSTNR... SERIES**



**2 FLUTE, TAPER NECK BACK DRAFT TYPE**



- ▶ If the workpiece has draft angle, the interference length will be longer than the L2.
- ▶ Please refer to the effective neck length for the various draft angles
- ▶ In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle  $\theta_2$ ", and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

| Order No.         | Dimension(mm) |     |      |          |      |      |      |      |      |        | Effective Neck Length |      |      |      |      | Stock |    |   |
|-------------------|---------------|-----|------|----------|------|------|------|------|------|--------|-----------------------|------|------|------|------|-------|----|---|
|                   | D             | R   | L2   | $\theta$ | L1   | d1   | d2   | L3   | d3   | App. L | $\theta_2$            | 0.5° | 1°   | 1.5° | 2°   |       | 3° |   |
| ZSTNR2015-20-0903 | 1.5           | 0.3 | 20   | 0.9      | 1.35 | 1.42 | 2.01 | 65   | 6    | 3.89   | 4.5                   | x    | 21.5 | 22.5 | 23.2 | 24.8  | ▲  |   |
| ZSTNR2015-25-0903 |               |     | 25   |          |      |      | 2.16 | 70   |      |        | 3.9                   | x    | 26.5 | 27.7 | 28.5 | 31.0  | ▲  |   |
| ZSTNR2015-30-0903 |               |     | 30   |          |      |      | 2.32 | 75   |      |        | 3.4                   | x    | 31.6 | 32.9 | 33.8 | 37.1  | ▲  |   |
| ZSTNR2020-30-0902 | 2.0           | 0.2 | 30   | 0.9      | 1.70 | 1.92 | 2.81 | 70   | 6    | 7.42   | 3.1                   | x    | 31.6 | 32.9 | 33.8 | 37.2  | ▲  |   |
| ZSTNR2020-40-0902 |               |     | 40   |          |      |      | 3.12 | 80   |      |        | 2.5                   | x    | 41.8 | 43.3 | 44.6 | -     | ▲  |   |
| ZSTNR2020-50-0902 |               |     | 50   |          |      |      | 3.44 | 90   |      |        | 2.1                   | x    | 51.9 | 53.6 | 55.7 | -     | ▲  |   |
| ZSTNR2020-12-0403 |               |     | 12   |          |      |      | 2.06 | 55   |      |        | 5.5                   | 13.0 | 13.6 | 14.1 | 14.5 | 15.6  | ▲  |   |
| ZSTNR2020-20-0903 |               |     | 20   |          |      |      | 2.50 | 65   |      |        | 4.1                   | x    | 21.5 | 22.5 | 23.2 | 24.9  | ▲  |   |
| ZSTNR2020-30-0903 |               |     | 30   |          |      |      | 2.81 | 70   |      |        | 3.1                   | x    | 31.6 | 32.9 | 33.8 | 37.1  | ▲  |   |
| ZSTNR2020-40-0903 |               | 40  | 3.12 | 80       | 2.5  | x    | 41.7 | 43.3 | 44.6 | -      | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-50-0903 |               | 50  | 3.44 | 90       | 2.1  | x    | 51.8 | 53.6 | 55.7 | -      | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-8-0405  |               | 8   | 2.01 | 50       | 6.8  | 8.7  | 9.0  | 9.3  | 9.5  | 10.4   | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-12-0405 |               | 12  | 2.06 | 55       | 5.6  | 13.0 | 13.6 | 14.1 | 14.4 | 15.5   | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-16-0405 |               | 16  | 2.12 | 60       | 4.7  | 17.0 | 17.8 | 18.3 | 18.7 | 20.7   | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-20-0905 |               | 20  | 2.50 | 65       | 4.2  | x    | 21.5 | 22.5 | 23.2 | 24.8   | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-25-0905 |               | 25  | 2.65 | 65       | 3.6  | x    | 26.6 | 27.7 | 28.5 | 30.9   | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-30-0905 |               | 30  | 2.81 | 70       | 3.1  | x    | 31.6 | 32.9 | 33.8 | 37.1   | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-40-0905 |               | 40  | 3.12 | 80       | 2.5  | x    | 41.7 | 43.2 | 44.6 | -      | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2020-50-0905 |               | 50  | 3.44 | 90       | 2.1  | x    | 51.8 | 53.6 | 55.6 | -      | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2030-40-0902 |               | 3.0 | 0.2  | 40       | 0.9  | 2.50 | 2.86 | 4.04 | 80   | 6      | 6.95                  | 2.0  | x    | 42.0 | 43.4 | -     | -  | ▲ |
| ZSTNR2030-50-0902 |               |     |      | 50       |      |      |      | 4.35 | 90   |        |                       | 1.6  | x    | 52.1 | 53.7 | -     | -  | ▲ |
| ZSTNR2030-60-0902 | 60            |     |      | 4.67     |      |      |      | 100  | 1.4  |        |                       | x    | 62.2 | -    | -    | -     | ▲  |   |
| ZSTNR2030-40-0903 | 40            |     |      | 4.04     |      |      |      | 80   | 2.0  |        |                       | x    | 42.0 | 43.4 | -    | -     | ▲  |   |
| ZSTNR2030-50-0903 | 50            |     |      | 4.35     |      |      |      | 90   | 1.7  |        |                       | x    | 52.1 | 53.7 | -    | -     | ▲  |   |
| ZSTNR2030-60-0903 | 60            |     |      | 4.67     |      |      |      | 100  | 1.4  |        |                       | x    | 62.2 | -    | -    | -     | ▲  |   |
| ZSTNR2030-40-0905 | 40            |     | 4.04 | 80       | 2.0  | x    | 42.0 | 43.4 | -    | -      | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2030-50-0905 | 50            |     | 4.35 | 90       | 1.7  | x    | 52.1 | 53.7 | -    | -      | ▲                     |      |      |      |      |       |    |   |
| ZSTNR2030-60-0905 | 60            |     | 4.67 | 100      | 1.4  | x    | 62.1 | -    | -    | -      | ▲                     |      |      |      |      |       |    |   |

X No application  
- No interference

▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions B115~B116

■ Applicable Working Material

| Carbon Steels (S45C, S55C...)<br>~ HB225 | Alloy Steels (SCM, SK...)<br>HB225~325 | Prehardened Steels (NAK...)<br>HRc30~50 | Hardened Steels |              | Copper | Graphite | Cast Iron FCD400, 500 | Aluminum | Stainless Sheets |
|--|--|---|-----------------|--------------|--------|----------|-----------------------|----------|------------------|
|  |  |   | ~Hrc55 SKD61    | ~Hrc55 SKD11 |        |          |                       |          |                  |
| ○  | ○                                      | ○                                       | ◎               | ◎            | ○      |          |                       |          |                  |

○: General Application ◎: The most suitable Application

■ Tolerance

| Mill Dia. (mm) | Shank Dia. |
|----------------|------------|
| 0 ~ -0.015     | h6         |

※ Items can be changed for quality improvement without notice.

TOM45  
for General Steels

TOTIME65  
for Die Steels  
Hard end Steels

TOTIME48  
for Non-Ferro us  
Metal

TOTIME3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials





**CN2BE** SERIES



**CBN 2 FLUTE BALL NOSE**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.       | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|-----------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                 | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CN2BE002000 KKK | R0.10               | 0.2           | 4              | 0.2           | -                  | 40             | ▲     |
| CN2BE002005 KKK | R0.10               | 0.2           | 4              | 0.2           | 0.5                | 40             | ▲     |
| CN2BE002010 KKK | R0.10               | 0.2           | 4              | 0.2           | 1.0                | 40             | ▲     |
| CNSBE003000 KKK | R0.15               | 0.3           | 4              | 0.3           | -                  | 40             | ▲     |
| CN2BE003010 KKK | R0.15               | 0.3           | 4              | 0.3           | 1.0                | 40             | ▲     |
| CN2BE003015 KKK | R0.15               | 0.3           | 4              | 0.3           | 1.5                | 40             | ▲     |
| CN2BE003020 KKK | R0.15               | 0.3           | 4              | 0.3           | 2.0                | 40             | ▲     |
| CN2BE004000 KKK | R0.20               | 0.4           | 4              | 0.4           | -                  | 40             | ▲     |
| CN2BE004010 KKK | R0.20               | 0.4           | 4              | 0.4           | 1.0                | 40             | ▲     |
| CN2BE004015 KKK | R0.20               | 0.4           | 4              | 0.4           | 1.5                | 40             | ▲     |
| CN2BE004020 KKK | R0.20               | 0.4           | 4              | 0.4           | 2.0                | 40             | ▲     |
| CN2BE004030 KKK | R0.20               | 0.4           | 4              | 0.4           | 3.0                | 40             | ▲     |
| CN2BE005000 KKK | R0.25               | 0.5           | 4              | 0.5           | -                  | 45             | ▲     |
| CN2BE005010 KKK | R0.25               | 0.5           | 4              | 0.5           | 1.0                | 45             | ▲     |
| CN2BE005020 KKK | R0.25               | 0.5           | 4              | 0.5           | 2.0                | 45             | ▲     |
| CN2BE005030 KKK | R0.25               | 0.5           | 4              | 0.5           | 3.0                | 45             | ▲     |
| CN2BE005040 KKK | R0.25               | 0.5           | 4              | 0.5           | 4.0                | 45             | ▲     |
| CN2BE006000 KKK | R0.30               | 0.6           | 4              | 0.6           | -                  | 45             | ▲     |
| CN2BE006020 KKK | R0.30               | 0.6           | 4              | 0.6           | 2.0                | 45             | ▲     |
| CN2BE006030 KKK | R0.30               | 0.6           | 4              | 0.6           | 3.0                | 45             | ▲     |
| CN2BE006040 KKK | R0.30               | 0.6           | 4              | 0.6           | 4.0                | 45             | ▲     |
| CN2BE006060 KKK | R0.30               | 0.6           | 4              | 0.6           | 6.0                | 45             | ▲     |
| CN2BE008000 KKK | R0.40               | 0.8           | 4              | 0.8           | -                  | 45             | ▲     |
| CN2BE008020 KKK | R0.40               | 0.8           | 4              | 0.8           | 2.0                | 45             | ▲     |
| CN2BE008040 KKK | R0.40               | 0.8           | 4              | 0.8           | 4.0                | 45             | ▲     |
| CN2BE008060 KKK | R0.40               | 0.8           | 4              | 0.8           | 6.0                | 45             | ▲     |
| CN2BE008080 KKK | R0.40               | 0.8           | 4              | 0.8           | 8.0                | 45             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B117~B118

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |



**CN2BE** SERIES



**CBN 2 FLUTE BALL NOSE**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.       | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|-----------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                 | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CN2BE010000 KKK | R0.50               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |
| CN2BE010025 KKK | R0.50               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CN2BE010040 KKK | R0.50               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CN2BE010060 KKK | R0.50               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CN2BE010080 KKK | R0.50               | 1.0           | 4              | 1.0           | 8.0                | 50             | ▲     |
| CN2BE012000 KKK | R0.60               | 1.2           | 4              | 1.2           | -                  | 50             | ▲     |
| CN2BE012030 KKK | R0.60               | 1.2           | 4              | 1.2           | 3.0                | 50             | ▲     |
| CN2BE012040 KKK | R0.60               | 1.2           | 4              | 1.2           | 4.0                | 50             | ▲     |
| CN2BE012060 KKK | R0.60               | 1.2           | 4              | 1.2           | 6.0                | 50             | ▲     |
| CN2BE012080 KKK | R0.60               | 1.2           | 4              | 1.2           | 8.0                | 50             | ▲     |
| CN2BE015000 KKK | R0.75               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CN2BE015040 KKK | R0.75               | 1.5           | 4              | 1.5           | 4.0                | 50             | ▲     |
| CN2BE015060 KKK | R0.75               | 1.5           | 4              | 1.5           | 6.0                | 50             | ▲     |
| CN2BE015080 KKK | R0.75               | 1.5           | 4              | 1.5           | 8.0                | 50             | ▲     |
| CN2BE015100 KKK | R0.75               | 1.5           | 4              | 1.5           | 10.0               | 50             | ▲     |
| CN2BE020000 KKK | R1.00               | 2.0           | 4              | 2.0           | -                  | 50             | ▲     |
| CN2BE020060 KKK | R1.00               | 2.0           | 4              | 2.0           | 6.0                | 50             | ▲     |
| CN2BE020080 KKK | R1.00               | 2.0           | 4              | 2.0           | 8.0                | 50             | ▲     |
| CN2BE020100 KKK | R1.00               | 2.0           | 4              | 2.0           | 10.0               | 50             | ▲     |
| CN2BE030000 KKK | R1.50               | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CN2BE030080 KKK | R1.50               | 3.0           | 4              | 2.5           | 8.0                | 50             | ▲     |
| CN2BE030100 KKK | R1.50               | 3.0           | 4              | 2.5           | 10.0               | 50             | ▲     |
| CN2BE030120 KKK | R1.50               | 3.0           | 4              | 2.5           | 12.0               | 50             | ▲     |
| CN2BE030160 KKK | R1.50               | 3.0           | 4              | 2.5           | 16.0               | 60             | ▲     |
| CN2BE030200 KKK | R1.50               | 3.0           | 4              | 2.5           | 20.0               | 60             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B117~B118

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

TCM45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-Ferrous  
Metal

TOTIME 3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials



**CP2BE** SERIES



**CBN 2 FLUTE BALL NOSE**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|-------------------------|----------------------|
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.       | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|-----------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                 | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CP2BE002000 KKK | R0.10               | 0.2           | 4              | 0.2           | -                  | 40             | ▲     |
| CP2BE002005 KKK | R0.10               | 0.2           | 4              | 0.2           | 0.5                | 40             | ▲     |
| CP2BE002010 KKK | R0.01               | 0.2           | 4              | 0.2           | 1.0                | 40             | ▲     |
| CP2BE003000 KKK | R0.15               | 0.3           | 4              | 0.3           | -                  | 40             | ▲     |
| CP2BE003010 KKK | R0.15               | 0.3           | 4              | 0.3           | 1.0                | 40             | ▲     |
| CP2BE003015 KKK | R0.15               | 0.3           | 4              | 0.3           | 1.5                | 40             | ▲     |
| CP2BE003020 KKK | R0.15               | 0.3           | 4              | 0.3           | 2.0                | 40             | ▲     |
| CP2BE004000 KKK | R0.20               | 0.4           | 4              | 0.4           | -                  | 40             | ▲     |
| CP2BE004010 KKK | R0.20               | 0.4           | 4              | 0.4           | 1.0                | 40             | ▲     |
| CP2BE004015 KKK | R0.20               | 0.4           | 4              | 0.4           | 1.5                | 40             | ▲     |
| CP2BE004020 KKK | R0.20               | 0.4           | 4              | 0.4           | 2.0                | 40             | ▲     |
| CP2BE004030 KKK | R0.20               | 0.4           | 4              | 0.4           | 3.0                | 40             | ▲     |
| CP2BE005000 KKK | R0.25               | 0.5           | 4              | 0.5           | -                  | 45             | ▲     |
| CP2BE005010 KKK | R0.25               | 0.5           | 4              | 0.5           | 1.0                | 45             | ▲     |
| CP2BE005020 KKK | R0.25               | 0.5           | 4              | 0.5           | 2.0                | 45             | ▲     |
| CP2BE005030 KKK | R0.25               | 0.5           | 4              | 0.5           | 3.0                | 45             | ▲     |
| CP2BE005040 KKK | R0.25               | 0.5           | 4              | 0.5           | 4.0                | 45             | ▲     |
| CP2BE006000 KKK | R0.30               | 0.6           | 4              | 0.6           | -                  | 45             | ▲     |
| CP2BE006020 KKK | R0.30               | 0.6           | 4              | 0.6           | 2.0                | 45             | ▲     |
| CP2BE006030 KKK | R0.30               | 0.6           | 4              | 0.6           | 3.0                | 45             | ▲     |
| CP2BE006040 KKK | R0.30               | 0.6           | 4              | 0.6           | 4.0                | 45             | ▲     |
| CP2BE006060 KKK | R0.30               | 0.6           | 4              | 0.6           | 6.0                | 45             | ▲     |
| CP2BE008000 KKK | R0.40               | 0.8           | 4              | 0.8           | -                  | 45             | ▲     |
| CP2BE008020 KKK | R0.40               | 0.8           | 4              | 0.8           | 2.0                | 45             | ▲     |
| CP2BE008040 KKK | R0.40               | 0.8           | 4              | 0.8           | 4.0                | 45             | ▲     |
| CP2BE008060 KKK | R0.40               | 0.8           | 4              | 0.8           | 6.0                | 45             | ▲     |
| CP2BE008080 KKK | R0.40               | 0.8           | 4              | 0.8           | 8.0                | 45             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B117~B118

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |



**CP2BE** SERIES



**CBN 2 FLUTE BALL NOSE**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.       | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|-----------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                 | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CP2BE010000 KKK | R0.50               | 1.0           | 4              | 1.2           | -                  | 50             | ▲     |
| CP2BE010025 KKK | R0.50               | 1.0           | 4              | 1.2           | 2.5                | 50             | ▲     |
| CP2BE010040 KKK | R0.50               | 1.0           | 4              | 1.2           | 4.0                | 50             | ▲     |
| CP2BE010060 KKK | R0.50               | 1.0           | 4              | 1.2           | 6.0                | 50             | ▲     |
| CP2BE010080 KKK | R0.05               | 1.0           | 4              | 1.2           | 8.0                | 50             | ▲     |
| CP2BE012000 KKK | R0.60               | 1.2           | 4              | 1.2           | -                  | 50             | ▲     |
| CP2BE012030 KKK | R0.60               | 1.2           | 4              | 1.2           | 3.0                | 50             | ▲     |
| CP2BE012040 KKK | R0.60               | 1.2           | 4              | 1.2           | 4.0                | 50             | ▲     |
| CP2BE012060 KKK | R0.60               | 1.2           | 4              | 1.2           | 6.0                | 50             | ▲     |
| CP2BE012080 KKK | R0.60               | 1.2           | 4              | 1.2           | 8.0                | 50             | ▲     |
| CP2BE015000 KKK | R0.75               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CP2BE015040 KKK | R0.75               | 1.5           | 4              | 1.5           | 4.0                | 50             | ▲     |
| CP2BE015060 KKK | R0.75               | 1.5           | 4              | 1.5           | 6.0                | 50             | ▲     |
| CP2BE015080 KKK | R0.75               | 1.5           | 4              | 1.5           | 8.0                | 50             | ▲     |
| CP2BE015100 KKK | R0.75               | 1.5           | 4              | 1.5           | 10.0               | 50             | ▲     |
| CP2BE020000 KKK | R1.00               | 2.0           | 4              | 2.0           | -                  | 50             | ▲     |
| CP2BE020060 KKK | R1.00               | 2.0           | 4              | 2.0           | 6.0                | 50             | ▲     |
| CP2BE020080 KKK | R1.00               | 2.0           | 4              | 2.0           | 8.0                | 50             | ▲     |
| CP2BE020100 KKK | R1.00               | 2.0           | 4              | 2.0           | 10.0               | 50             | ▲     |
| CP2BE030000 KKK | R1.50               | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CP2BE030080 KKK | R1.50               | 3.0           | 4              | 2.5           | 8.0                | 50             | ▲     |
| CP2BE030100 KKK | R1.50               | 3.0           | 4              | 2.5           | 10.0               | 50             | ▲     |
| CP2BE030120 KKK | R1.50               | 3.0           | 4              | 2.5           | 12.0               | 50             | ▲     |
| CP2BE030160 KKK | R1.50               | 3.0           | 4              | 2.5           | 16.0               | 60             | ▲     |
| CP2BE030200 KKK | R1.50               | 3.0           | 4              | 2.5           | 20.0               | 60             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B117~B118

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |



**CN2CR**SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                  | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CN2CR0020002 KKK | R0.02               | 0.2           | 4              | 0.2           | -                  | 40             | ▲     |
| CN2CR0020052 KKK | R0.02               | 0.2           | 4              | 0.2           | 0.5                | 40             | ▲     |
| CN2CR0020102 KKK | R0.02               | 0.2           | 4              | 0.2           | 1.0                | 40             | ▲     |
| CN2CR0020005 KKK | R0.05               | 0.2           | 4              | 0.2           | -                  | 40             | ▲     |
| CN2CR0020055 KKK | R0.05               | 0.2           | 4              | 0.2           | 0.5                | 40             | ▲     |
| CN2CR0020105 KKK | R0.05               | 0.2           | 4              | 0.2           | 1.0                | 40             | ▲     |
| CN2CR0030002 KKK | R0.02               | 0.3           | 4              | 0.3           | -                  | 40             | ▲     |
| CN2CR0030102 KKK | R0.02               | 0.3           | 4              | 0.3           | 1.0                | 40             | ▲     |
| CN2CR0030152 KKK | R0.02               | 0.3           | 4              | 0.3           | 1.5                | 40             | ▲     |
| CN2CR0030202 KKK | R0.02               | 0.3           | 4              | 0.3           | 2.0                | 40             | ▲     |
| CN2CR0030005 KKK | R0.05               | 0.3           | 4              | 0.3           | -                  | 40             | ▲     |
| CN2CR0030105 KKK | R0.05               | 0.3           | 4              | 0.3           | 1.0                | 40             | ▲     |
| CN2CR0030155 KKK | R0.05               | 0.3           | 4              | 0.3           | 1.5                | 40             | ▲     |
| CN2CR0030205 KKK | R0.05               | 0.3           | 4              | 0.3           | 2.0                | 40             | ▲     |
| CN2CR0040002 KKK | R0.02               | 0.4           | 4              | 0.4           | -                  | 40             | ▲     |
| CN2CR0040102 KKK | R0.02               | 0.4           | 4              | 0.4           | 1.0                | 40             | ▲     |
| CN2CR0040152 KKK | R0.02               | 0.4           | 4              | 0.4           | 1.5                | 40             | ▲     |
| CN2CR0040202 KKK | R0.02               | 0.4           | 4              | 0.4           | 2.0                | 40             | ▲     |
| CN2CR0040302 KKK | R0.02               | 0.4           | 4              | 0.4           | 3.0                | 40             | ▲     |
| CN2CR0040005 KKK | R0.05               | 0.4           | 4              | 0.4           | -                  | 40             | ▲     |
| CN2CR0040105 KKK | R0.05               | 0.4           | 4              | 0.4           | 1.0                | 40             | ▲     |
| CN2CR0040155 KKK | R0.05               | 0.4           | 4              | 0.4           | 1.5                | 40             | ▲     |
| CN2CR0040205 KKK | R0.05               | 0.4           | 4              | 0.4           | 2.0                | 40             | ▲     |
| CN2CR0040305 KKK | R0.05               | 0.4           | 4              | 0.4           | 3.0                | 40             | ▲     |
| CN2CR0040001 KKK | R0.10               | 0.4           | 4              | 0.4           | -                  | 40             | ▲     |
| CN2CR0040101 KKK | R0.10               | 0.4           | 4              | 0.4           | 1.0                | 40             | ▲     |
| CN2CR0040151 KKK | R0.10               | 0.4           | 4              | 0.4           | 1.5                | 40             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |



**CN2CR**SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                  | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CN2CR0040201 KKK | R0.10               | 0.4           | 4              | 0.4           | 2                  | 40             | ▲     |
| CN2CR0040301 KKK | R0.10               | 0.4           | 4              | 0.4           | 3                  | 40             | ▲     |
| CN2CR0050002 KKK | R0.02               | 0.5           | 4              | 0.5           | -                  | 40             | ▲     |
| CN2CR0050102 KKK | R0.02               | 0.5           | 4              | 0.5           | 1                  | 40             | ▲     |
| CN2CR0050202 KKK | R0.02               | 0.5           | 4              | 0.5           | 2                  | 40             | ▲     |
| CN2CR0050302 KKK | R0.02               | 0.5           | 4              | 0.5           | 3                  | 40             | ▲     |
| CN2CR0050402 KKK | R0.02               | 0.5           | 4              | 0.5           | 4                  | 40             | ▲     |
| CN2CR0050005 KKK | R0.05               | 0.5           | 4              | 0.5           | -                  | 40             | ▲     |
| CN2CR0050105 KKK | R0.05               | 0.5           | 4              | 0.5           | 1                  | 40             | ▲     |
| CN2CR0050205 KKK | R0.05               | 0.5           | 4              | 0.5           | 2                  | 40             | ▲     |
| CN2CR0050305 KKK | R0.05               | 0.5           | 4              | 0.5           | 3                  | 40             | ▲     |
| CN2CR0050405 KKK | R0.05               | 0.5           | 4              | 0.5           | 4                  | 40             | ▲     |
| CN2CR0050001 KKK | R0.10               | 0.5           | 4              | 0.5           | -                  | 40             | ▲     |
| CN2CR0050101 KKK | R0.10               | 0.5           | 4              | 0.5           | 1                  | 40             | ▲     |
| CN2CR0050201 KKK | R0.10               | 0.5           | 4              | 0.5           | 2                  | 40             | ▲     |
| CN2CR0050301 KKK | R0.10               | 0.5           | 4              | 0.5           | 3                  | 40             | ▲     |
| CN2CR0050401 KKK | R0.10               | 0.5           | 4              | 0.5           | 4                  | 40             | ▲     |
| CN2CR0060002 KKK | R0.02               | 0.6           | 4              | 0.6           | -                  | 45             | ▲     |
| CN2CR0060202 KKK | R0.02               | 0.6           | 4              | 0.6           | 2                  | 45             | ▲     |
| CN2CR0060302 KKK | R0.02               | 0.6           | 4              | 0.6           | 3                  | 45             | ▲     |
| CN2CR0060402 KKK | R0.02               | 0.6           | 4              | 0.6           | 4                  | 45             | ▲     |
| CN2CR0060005 KKK | R0.05               | 0.6           | 4              | 0.6           | -                  | 45             | ▲     |
| CN2CR0060205 KKK | R0.05               | 0.6           | 4              | 0.6           | 2                  | 45             | ▲     |
| CN2CR0060305 KKK | R0.05               | 0.6           | 4              | 0.6           | 3                  | 45             | ▲     |
| CN2CR0060405 KKK | R0.05               | 0.6           | 4              | 0.6           | 4                  | 45             | ▲     |
| CN2CR0060001 KKK | R0.10               | 0.6           | 4              | 0.6           | -                  | 45             | ▲     |
| CN2CR0060201 KKK | R0.10               | 0.6           | 4              | 0.6           | 2                  | 45             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

|               |              |                    |                 |          |          |           |          |              |                  |          |          |      |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

TCM/45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-ferrous  
Metal

TOTIME 3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTN/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials



**CN2CR**SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose<br>R | Mill Diameter<br>D1 | Shank Diameter<br>D2 | Length of Cut<br>L1 | Length Below Shank<br>L2 | Overall Length<br>L | Stock |
|------------------|--------------------------|---------------------|----------------------|---------------------|--------------------------|---------------------|-------|
| CN2CR0060301 KKK | R0.10                    | 0.6                 | 4                    | 0.6                 | 3.0                      | 45                  | ▲     |
| CN2CR0060401 KKK | R0.10                    | 0.6                 | 4                    | 0.6                 | 4.0                      | 45                  | ▲     |
| CN2CR0060020 KKK | R0.20                    | 0.6                 | 4                    | 0.6                 | -                        | 45                  | ▲     |
| CN2CR0060220 KKK | R0.20                    | 0.6                 | 4                    | 0.6                 | 2.0                      | 45                  | ▲     |
| CN2CR0060320 KKK | R0.20                    | 0.6                 | 4                    | 0.6                 | 3.0                      | 45                  | ▲     |
| CN2CR0060420 KKK | R0.20                    | 0.6                 | 4                    | 0.6                 | 4.0                      | 45                  | ▲     |
| CN2CR0080002 KKK | R0.02                    | 0.8                 | 4                    | 0.8                 | -                        | 45                  | ▲     |
| CN2CR0080202 KKK | R0.02                    | 0.8                 | 4                    | 0.8                 | 2.0                      | 45                  | ▲     |
| CN2CR0080402 KKK | R0.02                    | 0.8                 | 4                    | 0.8                 | 4.0                      | 45                  | ▲     |
| CN2CR0080602 KKK | R0.02                    | 0.8                 | 4                    | 0.8                 | 6.0                      | 45                  | ▲     |
| CN2CR0080005 KKK | R0.05                    | 0.8                 | 4                    | 0.8                 | -                        | 45                  | ▲     |
| CN2CR0080205 KKK | R0.05                    | 0.8                 | 4                    | 0.8                 | 2.0                      | 45                  | ▲     |
| CN2CR0080405 KKK | R0.05                    | 0.8                 | 4                    | 0.8                 | 4.0                      | 45                  | ▲     |
| CN2CR0080605 KKK | R0.05                    | 0.8                 | 4                    | 0.8                 | 6.0                      | 45                  | ▲     |
| CN2CR0080001 KKK | R0.10                    | 0.8                 | 4                    | 0.8                 | -                        | 45                  | ▲     |
| CN2CR0080201 KKK | R0.10                    | 0.8                 | 4                    | 0.8                 | 2.0                      | 45                  | ▲     |
| CN2CR0080401 KKK | R0.10                    | 0.8                 | 4                    | 0.8                 | 4.0                      | 45                  | ▲     |
| CN2CR0080601 KKK | R0.10                    | 0.8                 | 4                    | 0.8                 | 6.0                      | 45                  | ▲     |
| CN2CR008000 KKK  | R0.20                    | 0.8                 | 4                    | 0.8                 | -                        | 45                  | ▲     |
| CN2CR008020 KKK  | R0.20                    | 0.8                 | 4                    | 0.8                 | 2.0                      | 45                  | ▲     |
| CN2CR008040 KKK  | R0.20                    | 0.8                 | 4                    | 0.8                 | 4.0                      | 45                  | ▲     |
| CN2CR008060 KKK  | R0.20                    | 0.8                 | 4                    | 0.8                 | 6.0                      | 45                  | ▲     |
| CN2CR0100002 KKK | R0.02                    | 1.0                 | 4                    | 1                   | -                        | 50                  | ▲     |
| CN2CR0100252 KKK | R0.02                    | 1.0                 | 4                    | 1                   | 2.5                      | 50                  | ▲     |
| CN2CR0100402 KKK | R0.02                    | 1.0                 | 4                    | 1                   | 4.0                      | 50                  | ▲     |
| CN2CR0100602 KKK | R0.02                    | 1.0                 | 4                    | 1                   | 6.0                      | 50                  | ▲     |
| CN2CR0100005 KKK | R0.05                    | 1.0                 | 4                    | 1                   | -                        | 50                  | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

|               |              |                    |                 |          |          |           |          |              |                  |          |          |      |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
| ~HB225        | HB225-325    | HRC30~40           | HRC40-45        | HRC45-55 | HRC55-70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

**CN2CR**<sub>SERIES</sub>



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.         | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|-------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                   | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CN2CR0100255 KKK  | R0.05               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CN2CR0100405 KKK  | R0.05               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CN2CR0100605 KKK  | R0.05               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CN2CR0100001 KKK  | R0.10               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |
| CM2CR0100251 KKK  | R0.10               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CN2CR0100401 KKK  | R0.10               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CN2CR0100601 KKK  | R0.10               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CN2CR01000020 KKK | R0.20               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |
| CN2CR01002520 KKK | R0.20               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CN2CR01004020 KKK | R0.20               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CN2CR01006020 KKK | R0.20               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CN2CR010000 KKK   | R0.30               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |
| CN2CR010025 KKK   | R0.30               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CN2CR010040 KKK   | R0.30               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CN2CR010060 KKK   | R0.30               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CN2CR0150002 KKK  | R0.02               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CN2CR0150402 KKK  | R0.02               | 1.5           | 4              | 1.5           | 4.0                | 50             | ▲     |
| CN2CR0150602 KKK  | R0.02               | 1.5           | 4              | 1.5           | 6.0                | 50             | ▲     |
| CN2CR0150802 KKK  | R0.02               | 1.5           | 4              | 1.5           | 8.0                | 50             | ▲     |
| CN2CR0151002 KKK  | R0.02               | 1.5           | 4              | 1.5           | 10.0               | 50             | ▲     |
| CN2CR0150005 KKK  | R0.05               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CN2CR0150405 KKK  | R0.05               | 1.5           | 4              | 1.5           | 4.0                | 50             | ▲     |
| CN2CR0150605 KKK  | R0.05               | 1.5           | 4              | 1.5           | 6.0                | 50             | ▲     |
| CN2CR0150805 KKK  | R0.05               | 1.5           | 4              | 1.5           | 8.0                | 50             | ▲     |
| CN2CR0151005 KKK  | R0.05               | 1.5           | 4              | 1.5           | 10.0               | 50             | ▲     |
| CN2CR0150001 KKK  | R0.10               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CN2CR0150401 KKK  | R0.10               | 1.5           | 4              | 1.5           | 4.0                | 50             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

TCM45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-ferrous  
Metal

TOTIME 3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials





**CN2CR**SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.         | Radius of Ball Nose<br>R | Mill Diameter<br>D1 | Shank Diameter<br>D2 | Length of Cut<br>L1 | Length Below Shank<br>L2 | Overall Length<br>L | Stock |
|-------------------|--------------------------|---------------------|----------------------|---------------------|--------------------------|---------------------|-------|
| CN2CR0150601 KKK  | R0.10                    | 1.5                 | 4                    | 1.5                 | 6                        | 50                  | ▲     |
| CN2CR0150801 KKK  | R0.10                    | 1.5                 | 4                    | 1.5                 | 8                        | 50                  | ▲     |
| CN2CR0151001 KKK  | R0.10                    | 1.5                 | 4                    | 1.5                 | 10                       | 50                  | ▲     |
| CN2CR01500020 KKK | R0.20                    | 1.5                 | 4                    | 1.5                 | -                        | 50                  | ▲     |
| CN2CR01504020 KKK | R0.20                    | 1.5                 | 4                    | 1.5                 | 4                        | 50                  | ▲     |
| CN2CR01506020 KKK | R0.20                    | 1.5                 | 4                    | 1.5                 | 6                        | 50                  | ▲     |
| CN2CR01508020 KKK | R0.20                    | 1.5                 | 4                    | 1.5                 | 8                        | 50                  | ▲     |
| CN2CR01510020 KKK | R0.20                    | 1.5                 | 4                    | 1.5                 | 10                       | 50                  | ▲     |
| CN2CR0150003 KKK  | R0.30                    | 1.5                 | 4                    | 1.5                 | -                        | 50                  | ▲     |
| CN2CR0150403 KKK  | R0.30                    | 1.5                 | 4                    | 1.5                 | 4                        | 50                  | ▲     |
| CN2CR0150603 KKK  | R0.30                    | 1.5                 | 4                    | 1.5                 | 6                        | 50                  | ▲     |
| CN2CR0150803 KKK  | R0.30                    | 1.5                 | 4                    | 1.5                 | 8                        | 50                  | ▲     |
| CN2CR0151003 KKK  | R0.30                    | 1.5                 | 4                    | 1.5                 | 10                       | 50                  | ▲     |
| CN2CR015000 KKK   | R0.50                    | 1.5                 | 4                    | 1.5                 | -                        | 50                  | ▲     |
| CN2CR015040 KKK   | R0.50                    | 1.5                 | 4                    | 1.5                 | 4                        | 50                  | ▲     |
| CN2CR015060 KKK   | R0.50                    | 1.5                 | 4                    | 1.5                 | 6                        | 50                  | ▲     |
| CN2CR015080 KKK   | R0.50                    | 1.5                 | 4                    | 1.5                 | 8                        | 50                  | ▲     |
| CN2CR015100 KKK   | R0.50                    | 1.5                 | 4                    | 1.5                 | 10                       | 50                  | ▲     |
| CN2CR0200005 KKK  | R0.05                    | 2.0                 | 4                    | 2.0                 | -                        | 50                  | ▲     |
| CN2CR0200605 KKK  | R0.05                    | 2.0                 | 4                    | 2.0                 | 6                        | 50                  | ▲     |
| CN2CR0200805 KKK  | R0.05                    | 2.0                 | 4                    | 2.0                 | 8                        | 50                  | ▲     |
| CN2CR0201005 KKK  | R0.05                    | 2.0                 | 4                    | 2.0                 | 10                       | 50                  | ▲     |
| CN2CR0200001 KKK  | R0.10                    | 2.0                 | 4                    | 2.0                 | -                        | 50                  | ▲     |
| CN2CR0200601 KKK  | R0.10                    | 2.0                 | 4                    | 2.0                 | 6                        | 50                  | ▲     |
| CN2CR0200801 KKK  | R0.10                    | 2.0                 | 4                    | 2.0                 | 8                        | 50                  | ▲     |
| CN2CA0201001 KKK  | R0.10                    | 2.0                 | 4                    | 2.0                 | 10                       | 50                  | ▲     |
| CN2CR0200002 KKK  | R0.20                    | 2.0                 | 4                    | 2.0                 | -                        | 50                  | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

|               |              |                    |                 |          |          |           |          |              |                  |          |          |      |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |



**CN2CR**<sub>SERIES</sub>



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                  | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CN2CR0200602 KKK | R0.20               | 2.0           | 4              | 2.0           | 6                  | 50             | ▲     |
| CN2CR0200802 KKK | R0.20               | 2.0           | 4              | 2.0           | 8                  | 50             | ▲     |
| CN2CR0201002 KKK | R0.20               | 2.0           | 4              | 2.0           | 10                 | 50             | ▲     |
| CN2CR0200003 KKK | R0.30               | 2.0           | 4              | 2.0           | -                  | 50             | ▲     |
| CN2CR0200603 KKK | R0.30               | 2.0           | 4              | 2.0           | 6                  | 50             | ▲     |
| CN2CR0200803 KKK | R0.30               | 2.0           | 4              | 2.0           | 8                  | 50             | ▲     |
| CN2CR0201003 KKK | R0.30               | 2.0           | 4              | 2.0           | 10                 | 50             | ▲     |
| CN2CR020000 KKK  | R0.50               | 2.0           | 4              | 2.0           | -                  | 50             | ▲     |
| CN2CR020060 KKK  | R0.50               | 2.0           | 4              | 2.0           | 6                  | 50             | ▲     |
| CN2CR020080 KKK  | R0.50               | 2.0           | 4              | 2.0           | 8                  | 50             | ▲     |
| CN2CR020100 KKK  | R0.50               | 2.0           | 4              | 2.0           | 10                 | 50             | ▲     |
| CN2CR0300005 KKK | R0.05               | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CN2CR0300805 KKK | R0.05               | 3.0           | 4              | 2.5           | 8                  | 50             | ▲     |
| CN2CR0301005 KKK | R0.05               | 3.0           | 4              | 2.5           | 10                 | 50             | ▲     |
| CN2CR0301205 KKK | R0.05               | 3.0           | 4              | 2.5           | 12                 | 50             | ▲     |
| CN2CR0301605 KKK | R0.05               | 3.0           | 4              | 2.5           | 16                 | 60             | ▲     |
| CN2CR0302005 KKK | R0.05               | 3.0           | 4              | 2.5           | 20                 | 60             | ▲     |
| CN2CR0300001 KKK | R0.10               | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CN2CR0300801 KKK | R0.10               | 3.0           | 4              | 2.5           | 8                  | 50             | ▲     |
| CN2CR0301001 KKK | R0.10               | 3.0           | 4              | 2.5           | 10                 | 50             | ▲     |
| CN2CR0301201 KKK | R0.10               | 3.0           | 4              | 2.5           | 12                 | 50             | ▲     |
| CN2CR0301601 KKK | R0.10               | 3.0           | 4              | 2.5           | 16                 | 60             | ▲     |
| CN2CR0302001 KKK | R0.10               | 3.0           | 4              | 2.5           | 20                 | 60             | ▲     |
| CN2CR0300002 KKK | R0.20               | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CN2CR0300802 KKK | R0.20               | 3.0           | 4              | 2.5           | 8                  | 50             | ▲     |
| CN2CR0301002 KKK | R0.20               | 3.0           | 4              | 2.5           | 10                 | 50             | ▲     |
| CN2CR0301202 KKK | R0.20               | 3.0           | 4              | 2.5           | 12                 | 50             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

|               |              |                    |                 |          |          |           |          |              |                  |          |          |      |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
| ~HB225        | HB225-325    | HRC30~40           | HRC40-45        | HRC45-55 | HRC55-70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

TOTIME65  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-ferrous  
Metal

TOTIME 3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTN/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials



# CN2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|-------------------------|----------------------|
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                  | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CN2CR0301602 KKK | R0.2                | 3.0           | 4              | 2.5           | 16                 | 60             | ▲     |
| CN2CR0302002 KKK | R0.2                | 3.0           | 4              | 2.5           | 20                 | 60             | ▲     |
| CN2CR0300003 KKK | R0.3                | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CN2CR0300803 KKK | R0.3                | 3.0           | 4              | 2.5           | 8                  | 50             | ▲     |
| CN2CR0301003 KKK | R0.3                | 3.0           | 4              | 2.5           | 10                 | 50             | ▲     |
| CN2CR0301203 KKK | R0.3                | 3.0           | 4              | 2.5           | 12                 | 50             | ▲     |
| CN2CR0301603 KKK | R0.3                | 3.0           | 4              | 2.5           | 16                 | 60             | ▲     |
| CN2CR0302003 KKK | R0.3                | 3.0           | 4              | 2.5           | 20                 | 60             | ▲     |
| CN2CR0300000 KKK | R0.5                | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CN2CR0300800 KKK | R0.5                | 3.0           | 4              | 2.5           | 8                  | 50             | ▲     |
| CN2CR0301000 KKK | R0.5                | 3.0           | 4              | 2.5           | 10                 | 50             | ▲     |
| CN2CR0301200 KKK | R0.5                | 3.0           | 4              | 2.5           | 12                 | 50             | ▲     |
| CN2CR0301600 KKK | R0.5                | 3.0           | 4              | 2.5           | 16                 | 60             | ▲     |
| CN2CR0302000 KKK | R0.5                | 3.0           | 4              | 2.5           | 20                 | 60             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |



**CP2CR**SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                  | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CP2CR0020002 KKK | R0.02               | 0.2           | 4              | 0.2           | -                  | 40             | ▲     |
| CP2CR0020052 KKK | R0.02               | 0.2           | 4              | 0.2           | 0.5                | 40             | ▲     |
| CP2CR0020102 KKK | R0.02               | 0.2           | 4              | 0.2           | 1.0                | 40             | ▲     |
| CP2CR0020005 KKK | R0.05               | 0.2           | 4              | 0.2           | -                  | 40             | ▲     |
| CP2CR0020055 KKK | R0.05               | 0.2           | 4              | 0.2           | 0.5                | 40             | ▲     |
| CP2CR0020105 KKK | R0.05               | 0.2           | 4              | 0.2           | 1.0                | 40             | ▲     |
| CP2CR0030002 KKK | R0.02               | 0.3           | 4              | 0.3           | -                  | 40             | ▲     |
| CP2CR0030102 KKK | R0.02               | 0.3           | 4              | 0.3           | 1.0                | 40             | ▲     |
| CP2CR0030152 KKK | R0.02               | 0.3           | 4              | 0.3           | 1.5                | 40             | ▲     |
| CP2CR0030202 KKK | R0.02               | 0.3           | 4              | 0.3           | 2.0                | 40             | ▲     |
| CP2CR0030005 KKK | R0.05               | 0.3           | 4              | 0.3           | -                  | 40             | ▲     |
| CP2CR0030105 KKK | R0.05               | 0.3           | 4              | 0.3           | 1.0                | 40             | ▲     |
| CP2CR0030155 KKK | R0.05               | 0.3           | 4              | 0.3           | 1.5                | 40             | ▲     |
| CP2CR0030205 KKK | R0.05               | 0.3           | 4              | 0.3           | 2.0                | 40             | ▲     |
| CP2CR0040002 KKK | R0.02               | 0.4           | 4              | 0.4           | -                  | 40             | ▲     |
| CP2CR0040102 KKK | R0.02               | 0.4           | 4              | 0.4           | 1.0                | 40             | ▲     |
| CP2CR0040152 KKK | R0.02               | 0.4           | 4              | 0.4           | 1.5                | 40             | ▲     |
| CP2CR0040202 KKK | R0.02               | 0.4           | 4              | 0.4           | 2.0                | 40             | ▲     |
| CP2CR0040302 KKK | R0.02               | 0.4           | 4              | 0.4           | 3.0                | 40             | ▲     |
| CP2CR0040005 KKK | R0.05               | 0.4           | 4              | 0.4           | -                  | 40             | ▲     |
| CP2CR0040105 KKK | R0.05               | 0.4           | 4              | 0.4           | 1.0                | 40             | ▲     |
| CP2CR0040155 KKK | R0.05               | 0.4           | 4              | 0.4           | 1.5                | 40             | ▲     |
| CP2CR0040205 KKK | R0.05               | 0.4           | 4              | 0.4           | 2.0                | 40             | ▲     |
| CP2CR0040305 KKK | R0.05               | 0.4           | 4              | 0.4           | 3.0                | 40             | ▲     |
| CP2CR0040001 KKK | R0.10               | 0.4           | 4              | 0.4           | -                  | 40             | ▲     |
| CP2CR0040101 KKK | R0.10               | 0.4           | 4              | 0.4           | 1.0                | 40             | ▲     |
| CP2CR0040151 KKK | R0.1                | 0.4           | 4              | 0.4           | 1.5                | 40             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

TCM45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
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Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials



**CP2CR** SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose<br>R | Mill Diameter<br>D1 | Shank Diameter<br>D2 | Length of Cut<br>L1 | Length Below Shank<br>L2 | Overall Length<br>L | Stock |
|------------------|--------------------------|---------------------|----------------------|---------------------|--------------------------|---------------------|-------|
| CP2CR0040201 KKK | R0.10                    | 0.4                 | 4                    | 0.4                 | 2                        | 40                  | ▲     |
| CP2CR0040301 KKK | R0.10                    | 0.4                 | 4                    | 0.4                 | 3                        | 40                  | ▲     |
| CP2CR0050002 KKK | R0.02                    | 0.5                 | 4                    | 0.5                 | -                        | 40                  | ▲     |
| CP2CR0050102 KKK | R0.02                    | 0.5                 | 4                    | 0.5                 | 1                        | 40                  | ▲     |
| CP2CR0050202 KKK | R0.02                    | 0.5                 | 4                    | 0.5                 | 2                        | 40                  | ▲     |
| CP2CR0050302 KKK | R0.02                    | 0.5                 | 4                    | 0.5                 | 3                        | 40                  | ▲     |
| CP2CR0050402 KKK | R0.02                    | 0.5                 | 4                    | 0.5                 | 4                        | 40                  | ▲     |
| CP2CR0050005 KKK | R0.05                    | 0.5                 | 4                    | 0.5                 | -                        | 40                  | ▲     |
| CP2CR0050105 KKK | R0.05                    | 0.5                 | 4                    | 0.5                 | 1                        | 40                  | ▲     |
| CP2CR0050205 KKK | R0.05                    | 0.5                 | 4                    | 0.5                 | 2                        | 40                  | ▲     |
| CP2CR0050305 KKK | R0.05                    | 0.5                 | 4                    | 0.5                 | 3                        | 40                  | ▲     |
| CP2CR0050405 KKK | R0.05                    | 0.5                 | 4                    | 0.5                 | 4                        | 40                  | ▲     |
| CP2CR0050001 KKK | R0.10                    | 0.5                 | 4                    | 0.5                 | -                        | 40                  | ▲     |
| CP2CR0050101 KKK | R0.10                    | 0.5                 | 4                    | 0.5                 | 1                        | 40                  | ▲     |
| CP2CR0050201 KKK | R0.10                    | 0.5                 | 4                    | 0.5                 | 2                        | 40                  | ▲     |
| CP2CR0050301 KKK | R0.10                    | 0.5                 | 4                    | 0.5                 | 3                        | 40                  | ▲     |
| CP2CR0050401 KKK | R0.10                    | 0.5                 | 4                    | 0.5                 | 4                        | 40                  | ▲     |
| CP2CR0060002 KKK | R0.02                    | 0.6                 | 4                    | 0.6                 | -                        | 45                  | ▲     |
| CP2CR0060202 KKK | R0.02                    | 0.6                 | 4                    | 0.6                 | 2                        | 45                  | ▲     |
| CP2CR0060302 KKK | R0.02                    | 0.6                 | 4                    | 0.6                 | 3                        | 45                  | ▲     |
| CP2CR0060402 KKK | R0.02                    | 0.6                 | 4                    | 0.6                 | 4                        | 45                  | ▲     |
| CP2CR0060005 KKK | R0.05                    | 0.6                 | 4                    | 0.6                 | -                        | 45                  | ▲     |
| CP2CR0060205 KKK | R0.05                    | 0.6                 | 4                    | 0.6                 | 2                        | 45                  | ▲     |
| CP2CR0060305 KKK | R0.05                    | 0.6                 | 4                    | 0.6                 | 3                        | 45                  | ▲     |
| CP2CR0060405 KKK | R0.05                    | 0.6                 | 4                    | 0.6                 | 4                        | 45                  | ▲     |
| CP2CR0060001 KKK | R0.10                    | 0.6                 | 4                    | 0.6                 | -                        | 45                  | ▲     |
| CP2CR0060201 KKK | R0.10                    | 0.6                 | 4                    | 0.6                 | 2                        | 45                  | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |



**CP2CR**SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                  | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CP2CR0060301 KKK | R0.10               | 0.6           | 4              | 0.6           | 3.0                | 45             | ▲     |
| CP2CR0060401 KKK | R0.10               | 0.6           | 4              | 0.6           | 4.0                | 45             | ▲     |
| CP2CR0060020 KKK | R0.20               | 0.6           | 4              | 0.6           | -                  | 45             | ▲     |
| CP2CR0060220 KKK | R0.20               | 0.6           | 4              | 0.6           | 2.0                | 45             | ▲     |
| CP2CR0060320 KKK | R0.20               | 0.6           | 4              | 0.6           | 3.0                | 45             | ▲     |
| CP2CR0060420 KKK | R0.20               | 0.6           | 4              | 0.6           | 4.0                | 45             | ▲     |
| CP2CR0080002 KKK | R0.02               | 0.8           | 4              | 0.8           | -                  | 45             | ▲     |
| CP2CR0080202 KKK | R0.02               | 0.8           | 4              | 0.8           | 2.0                | 45             | ▲     |
| CP2CR0C80402 KKK | R0.02               | 0.8           | 4              | 0.8           | 4.0                | 45             | ▲     |
| CP2CR0080602 KKK | R0.02               | 0.8           | 4              | 0.8           | 6.0                | 45             | ▲     |
| CP2CR0080005 KKK | R0.05               | 0.8           | 4              | 0.8           | -                  | 45             | ▲     |
| CP2CR0080205 KKK | R0.05               | 0.8           | 4              | 0.8           | 2.0                | 45             | ▲     |
| CP2CR0080405 KKK | R0.05               | 0.8           | 4              | 0.8           | 4.0                | 45             | ▲     |
| CP2CR0080605 KKK | R0.05               | 0.8           | 4              | 0.8           | 6.0                | 45             | ▲     |
| CP2CR0080001 KKK | R0.10               | 0.8           | 4              | 0.8           | -                  | 45             | ▲     |
| CP2CR0080201 KKK | R0.10               | 0.8           | 4              | 0.8           | 2.0                | 45             | ▲     |
| CP2CR0080401 KKK | R0.10               | 0.8           | 4              | 0.8           | 4.0                | 45             | ▲     |
| CP2CR0080601 KKK | R0.10               | 0.8           | 4              | 0.8           | 6.0                | 45             | ▲     |
| CP2CR008000 KKK  | R0.20               | 0.8           | 4              | 0.8           | -                  | 45             | ▲     |
| CP2CR008020 KKK  | R0.20               | 0.8           | 4              | 0.8           | 2.0                | 45             | ▲     |
| CP2CR008040 KKK  | R0.20               | 0.8           | 4              | 0.8           | 4.0                | 45             | ▲     |
| CP2CR008060 KKK  | R0.20               | 0.8           | 4              | 0.8           | 6.0                | 45             | ▲     |
| CP2CR0100002 KKK | R0.02               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |
| CP2CR0100252 KKK | R0.02               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CP2CR0100402 KKK | R0.02               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CP2CR0100602 KKK | R0.02               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CP2CR0100005 KKK | R0.05               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225-325    | HRC30~40           | HRC40-45        | HRC45-55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

TCM45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-Ferrous  
Metal

TOTIME 3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials



**CP2CR** SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|-------------------------|----------------------|
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.         | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|-------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                   | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CP2CR0100255 KKK  | R0.05               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CP2CR0100405 KKK  | R0.05               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CP2CR0100605 KKK  | R0.05               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CP2CR0100001 KKK  | R0.10               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |
| CP2CR0100251 KKK  | R0.10               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CP2CR0100401 KKK  | R0.10               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CP2CR0100601 KKK  | R0.10               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CP2CR01000020 KKK | R0.20               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |
| CP2CR01002520 KKK | R0.20               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CP2CR01004020 KKK | R0.20               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CP2CR01006020 KKK | R0.20               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CP2CR010000 KKK   | R0.30               | 1.0           | 4              | 1.0           | -                  | 50             | ▲     |
| CP2CR010025 KKK   | R0.30               | 1.0           | 4              | 1.0           | 2.5                | 50             | ▲     |
| CP2CR010040 KKK   | R0.30               | 1.0           | 4              | 1.0           | 4.0                | 50             | ▲     |
| CP2CR010060 KKK   | R0.30               | 1.0           | 4              | 1.0           | 6.0                | 50             | ▲     |
| CP2CR0150002 KKK  | R0.02               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CP2CR0150402 KKK  | R0.02               | 1.5           | 4              | 1.5           | 4.0                | 50             | ▲     |
| CP2CR0150602 KKK  | R0.02               | 1.5           | 4              | 1.5           | 6.0                | 50             | ▲     |
| CP2CR0150802 KKK  | R0.02               | 1.5           | 4              | 1.5           | 8.0                | 50             | ▲     |
| CP2CR0151002 KKK  | R0.02               | 1.5           | 4              | 1.5           | 10.0               | 50             | ▲     |
| CP2CR0150005 KKK  | R0.05               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CP2CR0150405 KKK  | R0.05               | 1.5           | 4              | 1.5           | 4.0                | 50             | ▲     |
| CP2CR0150605 KKK  | R0.05               | 1.5           | 4              | 1.5           | 6.0                | 50             | ▲     |
| CP2CR0150805 KKK  | R0.05               | 1.5           | 4              | 1.5           | 8.0                | 50             | ▲     |
| CP2CR0151005 KKK  | R0.05               | 1.5           | 4              | 1.5           | 10.0               | 50             | ▲     |
| CP2CR0150001 KKK  | R0.10               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CP2CR0150401 KKK  | R0.10               | 1.5           | 4              | 1.5           | 4.0                | 50             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |



**CP2CR**SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.         | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|-------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                   | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CP2CR0150601 KKK  | R0.10               | 1.5           | 4              | 1.5           | 6                  | 50             | ▲     |
| CP2CR0150801 KKK  | R0.10               | 1.5           | 4              | 1.5           | 8                  | 50             | ▲     |
| CP2CR0151001 KKK  | R0.10               | 1.5           | 4              | 1.5           | 10                 | 50             | ▲     |
| CP2CR01500020 KKK | R0.20               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CP2CR01504020 KKK | R0.20               | 1.5           | 4              | 1.5           | 4                  | 50             | ▲     |
| CP2CR01506020 KKK | R0.20               | 1.5           | 4              | 1.5           | 6                  | 50             | ▲     |
| CP2CR01508020 KKK | R0.20               | 1.5           | 4              | 1.5           | 8                  | 50             | ▲     |
| CP2CR01510020 KKK | R0.20               | 1.5           | 4              | 1.5           | 10                 | 50             | ▲     |
| CP2CR0150003 KKK  | R0.30               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CP2CR0150403 KKK  | R0.30               | 1.5           | 4              | 1.5           | 4                  | 50             | ▲     |
| CP2CR0150603 KKK  | R0.30               | 1.5           | 4              | 1.5           | 6                  | 50             | ▲     |
| CP2CR0150803 KKK  | R0.30               | 1.5           | 4              | 1.5           | 8                  | 50             | ▲     |
| CP2CR0151003 KKK  | R0.30               | 1.5           | 4              | 1.5           | 10                 | 50             | ▲     |
| CP2CR015000 KKK   | R0.50               | 1.5           | 4              | 1.5           | -                  | 50             | ▲     |
| CP2CR015040 KKK   | R0.50               | 1.5           | 4              | 1.5           | 4                  | 50             | ▲     |
| CP2CR015060 KKK   | R0.50               | 1.5           | 4              | 1.5           | 6                  | 50             | ▲     |
| CP2CR015080 KKK   | R0.50               | 1.5           | 4              | 1.5           | 8                  | 50             | ▲     |
| CP2CR015100 KKK   | R0.50               | 1.5           | 4              | 1.5           | 10                 | 50             | ▲     |
| CP2CR0200005 KKK  | R0.05               | 2.0           | 4              | 2.0           | -                  | 50             | ▲     |
| CP2CR0200605 KKK  | R0.05               | 2.0           | 4              | 2.0           | 6                  | 50             | ▲     |
| CP2CR0200805 KKK  | R0.05               | 2.0           | 4              | 2.0           | 8                  | 50             | ▲     |
| CP2CR0201005 KKK  | R0.05               | 2.0           | 4              | 2.0           | 10                 | 50             | ▲     |
| CP2CR0200001 KKK  | R0.10               | 2.0           | 4              | 2.0           | -                  | 50             | ▲     |
| CP2CR0200601 KKK  | R0.10               | 2.0           | 4              | 2.0           | 6                  | 50             | ▲     |
| CP2CR0200801 KKK  | R0.10               | 2.0           | 4              | 2.0           | 8                  | 50             | ▲     |
| CP2CR0201001 KKK  | R0.10               | 2.0           | 4              | 2.0           | 10                 | 50             | ▲     |
| CP2CR0200002 KKK  | R0.20               | 2.0           | 4              | 2.0           | -                  | 50             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

TCM45 for General Steels  
TOTIME65 for Die Steels Hardened Steels  
TOTIME48 for Non-Ferrous Metal  
TOTIME 3839 for General Steels Cast Irons  
TDIA for Graphite  
Micro Diameter for General Purpose  
ZSTNB/ZSTNR for General Steels Die Steels  
CBN High Hardness Materials





**CP2CR** SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

(mm)unit:mm

| Order No.        | Radius of Ball Nose<br>R | Mill Diameter<br>D1 | Shank Diameter<br>D2 | Length of Cut<br>L1 | Length Below Shank<br>L2 | Overall Length<br>L | Stock |
|------------------|--------------------------|---------------------|----------------------|---------------------|--------------------------|---------------------|-------|
| CP2CR0200602 KKK | R0.20                    | 2.0                 | 4                    | 2.0                 | 6                        | 50                  | ▲     |
| CP2CR0200802 KKK | R0.20                    | 2.0                 | 4                    | 2.0                 | 8                        | 50                  | ▲     |
| CP2CR0201002 KKK | R0.20                    | 2.0                 | 4                    | 2.0                 | 10                       | 50                  | ▲     |
| CP2CR0200003 KKK | R0.30                    | 2.0                 | 4                    | 2.0                 | -                        | 50                  | ▲     |
| CP2CR0200603 KKK | R0.30                    | 2.0                 | 4                    | 2.0                 | 6                        | 50                  | ▲     |
| CP2CR0200803 KKK | R0.30                    | 2.0                 | 4                    | 2.0                 | 8                        | 50                  | ▲     |
| CP2CR0201003 KKK | R0.30                    | 2.0                 | 4                    | 2.0                 | 10                       | 50                  | ▲     |
| CP2CR020000 KKK  | R0.50                    | 2.0                 | 4                    | 2.0                 | -                        | 50                  | ▲     |
| CP2CR020060 KKK  | R0.50                    | 2.0                 | 4                    | 2.0                 | 6                        | 50                  | ▲     |
| CP2CR020080 KKK  | R0.50                    | 2.0                 | 4                    | 2.0                 | 8                        | 50                  | ▲     |
| CP2CR020100 KKK  | R0.50                    | 2.0                 | 4                    | 2.0                 | 10                       | 50                  | ▲     |
| CP2CR0300005 KKK | R0.05                    | 3.0                 | 4                    | 2.5                 | -                        | 50                  | ▲     |
| CP2CR0300805 KKK | R0.05                    | 3.0                 | 4                    | 2.5                 | 8                        | 50                  | ▲     |
| CP2CR0301005 KKK | R0.05                    | 3.0                 | 4                    | 2.5                 | 10                       | 50                  | ▲     |
| CP2CR0301205 KKK | R0.05                    | 3.0                 | 4                    | 2.5                 | 12                       | 50                  | ▲     |
| CP2CR0301605 KKK | R0.05                    | 3.0                 | 4                    | 2.5                 | 16                       | 60                  | ▲     |
| CP2CR0302005 KKK | R0.05                    | 3.0                 | 4                    | 2.5                 | 20                       | 60                  | ▲     |
| CP2CR0300001 KKK | R0.10                    | 3.0                 | 4                    | 2.5                 | -                        | 50                  | ▲     |
| CP2CR0300801 KKK | R0.10                    | 3.0                 | 4                    | 2.5                 | 8                        | 50                  | ▲     |
| CP2CR0301001 KKK | R0.10                    | 3.0                 | 4                    | 2.5                 | 10                       | 50                  | ▲     |
| CP2CR0301201 KKK | R0.10                    | 3.0                 | 4                    | 2.5                 | 12                       | 50                  | ▲     |
| CP2CR0301601 KKK | R0.10                    | 3.0                 | 4                    | 2.5                 | 16                       | 60                  | ▲     |
| CP2CR0302001 KKK | R0.10                    | 3.0                 | 4                    | 2.5                 | 20                       | 60                  | ▲     |
| CP2CR0300002 KKK | R0.20                    | 3.0                 | 4                    | 2.5                 | -                        | 50                  | ▲     |
| CP2CR0300802 KKK | R0.20                    | 3.0                 | 4                    | 2.5                 | 8                        | 50                  | ▲     |
| CP2CR0301002 KKK | R0.20                    | 3.0                 | 4                    | 2.5                 | 10                       | 50                  | ▲     |
| CP2CR0301202 KKK | R0.20                    | 3.0                 | 4                    | 2.5                 | 12                       | 50                  | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

● Recommend ○ Suit

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

**CP2CR** SERIES



**CBN, 2 FLUTE CORNER RADIUS**

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



|                         |                      |
|-------------------------|----------------------|
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
| 0~-0.010                | h6                   |

| Order No.        | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Stock |
|------------------|---------------------|---------------|----------------|---------------|--------------------|----------------|-------|
|                  | R                   | D1            | D2             | L1            | L2                 | L              |       |
| CP2CR0301602 KKK | R0.2                | 3.0           | 4              | 2.5           | 16                 | 60             | ▲     |
| CP2CR0302002 KKK | R0.2                | 3.0           | 4              | 2.5           | 20                 | 60             | ▲     |
| CP2CR0300003 KKK | R0.3                | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CP2CR0300803 KKK | R0.3                | 3.0           | 4              | 2.5           | 8                  | 50             | ▲     |
| CP2CR0301003 KKK | R0.3                | 3.0           | 4              | 2.5           | 10                 | 50             | ▲     |
| CP2CR0301203 KKK | R0.3                | 3.0           | 4              | 2.5           | 12                 | 50             | ▲     |
| CP2CR0301603 KKK | R0.3                | 3.0           | 4              | 2.5           | 16                 | 60             | ▲     |
| CP2CR0302003 KKK | R0.3                | 3.0           | 4              | 2.5           | 20                 | 60             | ▲     |
| CP2CR0300000 KKK | R0.5                | 3.0           | 4              | 2.5           | -                  | 50             | ▲     |
| CP2CR0300800 KKK | R0.5                | 3.0           | 4              | 2.5           | 8                  | 50             | ▲     |
| CP2CR0301000 KKK | R0.5                | 3.0           | 4              | 2.5           | 10                 | 50             | ▲     |
| CP2CR0301200 KKK | R0.5                | 3.0           | 4              | 2.5           | 12                 | 50             | ▲     |
| CP2CR0301600 KKK | R0.5                | 3.0           | 4              | 2.5           | 16                 | 60             | ▲     |
| CP2CR0302000 KKK | R0.5                | 3.0           | 4              | 2.5           | 20                 | 60             | ▲     |

▲ Stock △ Non-Stock  
Recommended Cutting Conditions B119

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened steels |          |          | Cast Iron | Aluminum | Copper Alloy | Stainless Steels | Titanium | Graphite | CFRP |
|---------------|--------------|--------------------|-----------------|----------|----------|-----------|----------|--------------|------------------|----------|----------|------|
| ~HB225        | HB225-325    | HRC30~40           | HRC40-45        | HRC45-55 | HRC55-70 |           |          |              |                  |          |          |      |
|               |              |                    |                 | ●        | ●        |           |          |              |                  |          |          |      |

● Recommend ○ Suit

TOTIME45  
for General Steels

TOTIME65  
for Die Steels  
Hardened Steels

TOTIME48  
for Non-Ferrous  
Metal

TOTIME 3839  
for General Steels  
Cast Irons

TDIA  
for Graphite

Micro Diameter  
for General Purpose

ZSTNB/ZSTNR  
for General Steels  
Die Steels

CBN  
High Hardness  
Materials