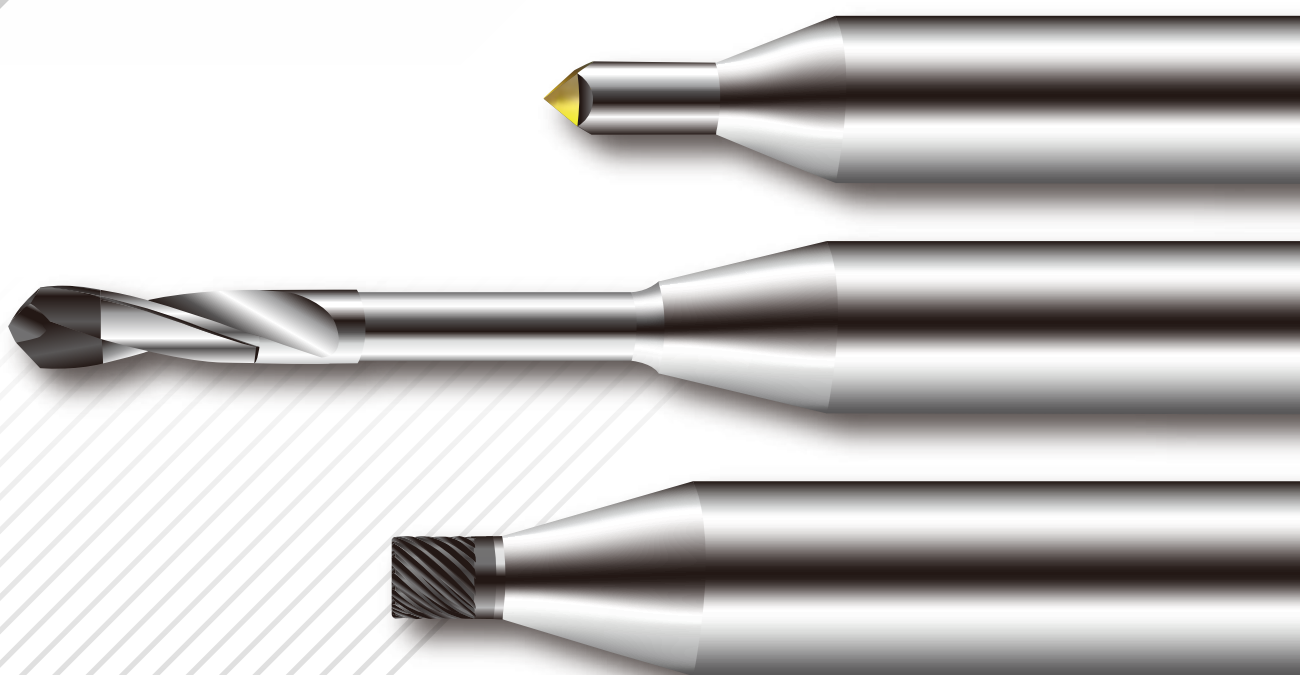




# DIAMOND CUTTING TOOLS

— **FOR HIGH-EFFICIENCY MACHINING** —

For high-efficiency machining of silicon carbide(SiC), ceramics and carbide!



For any special inquiries, please contact us.

**For Ultra-Hard  
Material**

DIAMOND

# PCD DIAMOND CUTTING TOOLS

## For Ultra-Hard Material Machining

Durable

Efficient

Precise

Quality

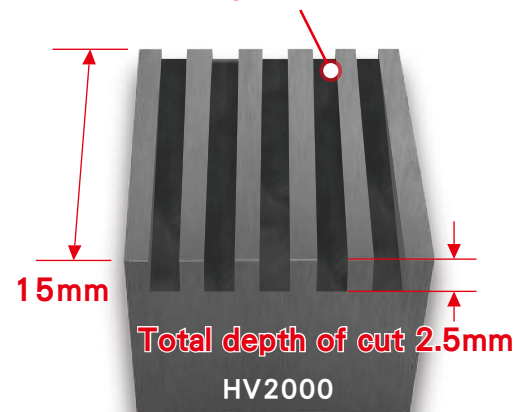
- For high-efficiency machining of silicon carbide(SiC), aluminum oxide ( $\text{Al}_2\text{O}_3$ ), zirconium oxide( $\text{ZrO}_2$ ), quartz( $\text{SiO}_2$ ), Silicon(Si) and carbide.
- Multi-flute design of end mills reduces cutting resistance and enhances machining efficiency.
- PCD helix tools can effectively shorten machining time, ensure stable machining accuracy and significantly improve production efficiency.



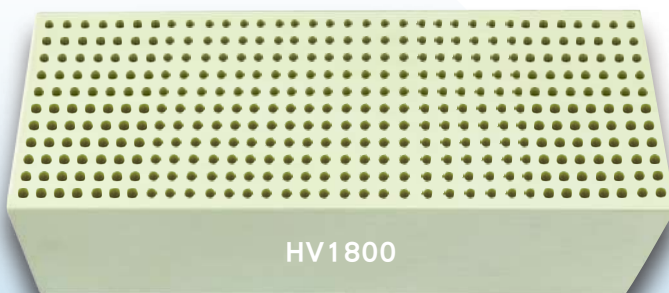
**PEHC15020001030 (Φ2mm)**

|                        |       |        |
|------------------------|-------|--------|
| Material               | SiC   |        |
| Cutting speed          | 60    | m/min  |
| Spindle speed          | 9550  | rpm    |
| Feed rate              | 140   | mm/min |
| Feed per tooth         | 0.001 | mm     |
| Axial depth of cutting | 0.05  | mm     |

Surface Roughness  $R_a = 0.3\mu\text{m}$



**SLOT MILLING!**



**PDH20140 (Φ1.4mm)**

|                        |                         |        |
|------------------------|-------------------------|--------|
| Material               | $\text{Al}_2\text{O}_3$ |        |
| Cutting speed          | 30                      | m/min  |
| Spindle speed          | 6850                    | rpm    |
| Feed rate              | 8                       | mm/min |
| Feed per revolution    | 0.001                   | mm/rev |
| Axial depth of cutting | 6                       | mm     |
| Depth per peck         | 0.05                    | mm     |

**The hole machining time is only 49 seconds!**

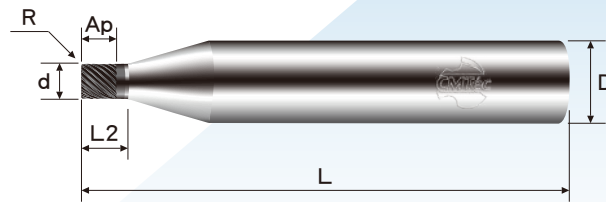
**HIGH-EFFICIENCY DRILLING!**

SIZE

# PCD DIAMOND END MILLS- Corner Radius- Helix Flute



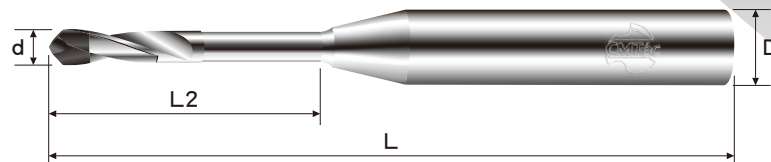
| d                | Tolerance |
|------------------|-----------|
| Φ                | 0 ~ -0.01 |
| Radius           | Tolerance |
| R                | ±0.005    |
| Bright Finishing | ○         |
| Finishing        | ◎         |
| Semi Finishing   | ◎         |
| Roughing         | —         |



| d   | R   | Ap  | L2 | L  | D | Flute | Stock | Order No.       |
|-----|-----|-----|----|----|---|-------|-------|-----------------|
| 1.0 | 0.1 | 1.5 | —  | 50 | 6 | 7     | ●     | PEHC7010001     |
| 1.0 | 0.1 | 1.8 | 3  | 50 | 6 | 7     | ●     | PEHC7010001030  |
| 1.0 | 0.1 | 1.8 | 5  | 50 | 6 | 7     |       | PEHC7010001050  |
| 2.0 | 0.1 | 1.5 | —  | 50 | 6 | 15    | ●     | PEHC15020001    |
| 2.0 | 0.1 | 1.8 | 3  | 50 | 6 | 15    | ●     | PEHC15020001030 |
| 2.0 | 0.1 | 1.8 | 5  | 50 | 6 | 15    |       | PEHC15020001050 |
| 2.0 | 0.2 | 1.5 | —  | 50 | 6 | 15    |       | PEHC15020002    |
| 2.0 | 0.2 | 1.8 | 3  | 50 | 6 | 15    |       | PEHC15020002030 |
| 2.0 | 0.2 | 1.8 | 5  | 50 | 6 | 15    |       | PEHC15020002050 |
| 3.0 | 0.1 | 1.5 | —  | 50 | 6 | 25    |       | PEHC25030001    |
| 3.0 | 0.1 | 1.8 | 3  | 50 | 6 | 25    | ●     | PEHC25030001030 |
| 3.0 | 0.1 | 1.8 | 5  | 50 | 6 | 25    |       | PEHC25030001050 |
| 3.0 | 0.2 | 1.5 | —  | 50 | 6 | 25    |       | PEHC25030002    |
| 3.0 | 0.2 | 1.8 | 3  | 50 | 6 | 25    |       | PEHC25030002030 |
| 3.0 | 0.2 | 1.8 | 5  | 50 | 6 | 25    |       | PEHC25030002050 |

SIZE

# PCD DIAMOND DRILLS- Helix Flute- 2Flutes



| d | Tolerance |
|---|-----------|
| Φ | 0 ~ -0.01 |

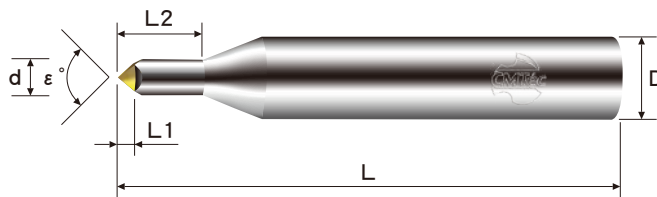
※ Machining must be performed using the G83 code (peck drilling cycle).



| d    | L2 | L  | D     | Flute | Stock | Order No. |
|------|----|----|-------|-------|-------|-----------|
| 0.45 | 7  | 38 | 3.175 | 2     | ●     | PDH20045  |
| 0.5  | 7  | 38 | 3.175 | 2     | ●     | PDH20050  |
| 0.6  | 7  | 38 | 3.175 | 2     |       | PDH20060  |
| 0.7  | 8  | 38 | 3.175 | 2     |       | PDH20070  |
| 0.8  | 8  | 38 | 3.175 | 2     |       | PDH20080  |
| 0.9  | 8  | 38 | 3.175 | 2     |       | PDH20090  |
| 1.0  | 8  | 38 | 3.175 | 2     | ●     | PDH20100  |
| 1.1  | 8  | 38 | 3.175 | 2     |       | PDH20110  |
| 1.2  | 8  | 38 | 3.175 | 2     | ●     | PDH20120  |
| 1.3  | 8  | 38 | 3.175 | 2     |       | PDH20130  |
| 1.4  | 8  | 38 | 3.175 | 2     |       | PDH20140  |
| 1.5  | 8  | 38 | 3.175 | 2     | ●     | PDH20150  |
| 1.6  | 8  | 38 | 3.175 | 2     |       | PDH20160  |
| 1.7  | 10 | 38 | 3.175 | 2     |       | PDH20170  |
| 1.8  | 10 | 38 | 3.175 | 2     |       | PDH20180  |
| 1.9  | 10 | 38 | 3.175 | 2     |       | PDH20190  |
| 2.0  | 10 | 38 | 3.175 | 2     | ●     | PDH20200  |

SIZE

# MONOCRYSTALLINE DIAMOND SPOTTING DRILLS



| Angle               | Tolerance     |
|---------------------|---------------|
| $\varepsilon^\circ$ | $\pm 1^\circ$ |

| d      | Tolerance  |
|--------|------------|
| $\Phi$ | $\pm 0.01$ |



| $\varepsilon^\circ$ | d   | L1   | L2 | L  | D     | Stock | Order No. |
|---------------------|-----|------|----|----|-------|-------|-----------|
| 90°                 | 1.0 | 0.50 | 3  | 38 | 3.175 | ●     | UDP010090 |
| 90°                 | 2.0 | 1.00 | 6  | 38 | 3.175 | ●     | UDP020090 |
| 120°                | 1.0 | 0.28 | 3  | 38 | 3.175 | ●     | UDP0100C0 |
| 120°                | 2.0 | 0.57 | 6  | 38 | 3.175 | ●     | UDP0200C0 |



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DOWNLOAD  
CUTTING TABLE

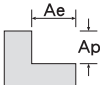
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 Taipei Branch : TEL/ +886-2-29043033 FAX/ +886-2-29030963  
 JingLi(Xiamen)Cutting Hardware : TEL/ +002-86-5926-155335~7  
 Overseas Sales E-Mail : telesales@cmtools.com.tw

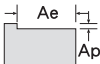
# Table 01

## PCD DIAMOND HELIX FLUTE END MILLS- CUTTING CONDITION TABLE

### Side Milling

| Material        | Ceramics (SiC, Al <sub>2</sub> O <sub>3</sub> , ZrO <sub>2</sub> ) / SiO <sub>2</sub> / Si / Carbide |            |               |            |            |             |
|-----------------|------------------------------------------------------------------------------------------------------|------------|---------------|------------|------------|-------------|
| Material Code   | —                                                                                                    |            |               |            |            |             |
| Hardness        | HV ≤ 2,500                                                                                           |            |               |            |            |             |
| Diameter        | Vc<br>(m/min)                                                                                        | S<br>(rpm) | F<br>(mm/min) | fz<br>(mm) | Ap<br>(mm) | Ae<br>(mm)  |
| 0.5 × 4 Flutes  | 60                                                                                                   | 40,000     | 240           | 0.0015     | ≤PCD Layer | 0.015~0.025 |
| 1.0 × 7 Flutes  | 125                                                                                                  | 40,000     | 280           | 0.001      | ≤PCD Layer | 0.03~0.05   |
| 2.0 × 15 Flutes | 125                                                                                                  | 20,000     | 300           | 0.001      | ≤PCD Layer | 0.06~0.10   |
| 3.0 × 25 Flutes | 125                                                                                                  | 13,300     | 330           | 0.001      | ≤PCD Layer | 0.09~0.15   |
| 4.0 × 37 Flutes | 125                                                                                                  | 10,000     | 370           | 0.001      | ≤PCD Layer | 0.12~0.20   |
| 5.0 × 47 Flutes | 125                                                                                                  | 8,000      | 380           | 0.001      | ≤PCD Layer | 0.15~0.25   |
| 6.0 × 57 Flutes | 125                                                                                                  | 6,600      | 380           | 0.001      | ≤PCD Layer | 0.18~0.30   |
| Remarks         |                 |            |               |            |            |             |

### Face Milling

| Material        | Ceramics (SiC, Al <sub>2</sub> O <sub>3</sub> , ZrO <sub>2</sub> ) / SiO <sub>2</sub> / Si / Carbide                                                                               |            |               |            |            |            |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|------------|------------|------------|
| Material Code   | —                                                                                                                                                                                  |            |               |            |            |            |
| Hardness        | HV ≤ 2,500                                                                                                                                                                         |            |               |            |            |            |
| Diameter        | Vc<br>(m/min)                                                                                                                                                                      | S<br>(rpm) | F<br>(mm/min) | fz<br>(mm) | Ap<br>(mm) | Ae<br>(mm) |
| 0.5 × 4 Flutes  | 60                                                                                                                                                                                 | 40,000     | 240           | 0.0015     | ≤0.015     | ≤0.35      |
| 1.0 × 7 Flutes  | 125                                                                                                                                                                                | 40,000     | 280           | 0.001      | ≤0.03      | ≤0.70      |
| 2.0 × 15 Flutes | 125                                                                                                                                                                                | 20,000     | 300           | 0.001      | ≤0.06      | ≤1.40      |
| 3.0 × 25 Flutes | 125                                                                                                                                                                                | 13,300     | 330           | 0.001      | ≤0.09      | ≤2.10      |
| 4.0 × 37 Flutes | 125                                                                                                                                                                                | 10,000     | 370           | 0.001      | ≤0.12      | ≤2.80      |
| 5.0 × 47 Flutes | 125                                                                                                                                                                                | 8,000      | 380           | 0.001      | ≤0.15      | ≤3.50      |
| 6.0 × 57 Flutes | 125                                                                                                                                                                                | 6,600      | 380           | 0.001      | ≤0.18      | ≤4.20      |
| Remarks         | ※ For pocket machining, please use the ramping method for entry.<br>(Ramping Angle : 0.5~3°)  |            |               |            |            |            |

※ Cutting formula :  $S = Vc \times 1000 / D / \pi (3.14)$        $F = fz \times Z \times S$

1. When the sound is piercing, please lower the spindle speed(S) (10~40%).
2. When the machine is vibrating, please decrease the feed rate(F) (10~40%).
3. When the spindle load is high, please decrease the feed rate(F) (10~40%).
4. These are recommended values which depend on the condition of the machine, fixture, lubricating & cooling systems... etc. They may have to be adapted.

# Table 02

## PCD DIAMOND HELIX FLUTE DRILLS- DRILLING CONDITION TABLE

| Material      | Ceramics (SiC, Al <sub>2</sub> O <sub>3</sub> , ZrO <sub>2</sub> ) / SiO <sub>2</sub> / Si / Carbide |            |               |                          |
|---------------|------------------------------------------------------------------------------------------------------|------------|---------------|--------------------------|
| Material Code | —                                                                                                    |            |               |                          |
| Hardness      | HV≦2,500                                                                                             |            |               |                          |
| Diameter      | Vc<br>(m/min)                                                                                        | S<br>(rpm) | F<br>(mm/min) | Q<br>Depth Per Peck (mm) |
| 0.3           | 30                                                                                                   | 31,900     | 1~10          | 0.05~0.30D               |
| 0.4           |                                                                                                      | 23,900     |               |                          |
| 0.5           |                                                                                                      | 19,100     |               |                          |
| 0.6           |                                                                                                      | 16,000     |               |                          |
| 0.7           |                                                                                                      | 13,700     |               |                          |
| 0.8           |                                                                                                      | 12,000     |               |                          |
| 0.9           |                                                                                                      | 10,600     |               |                          |
| 1.0           |                                                                                                      | 9,600      |               |                          |
| 1.1           |                                                                                                      | 8,700      |               |                          |
| 1.2           |                                                                                                      | 8,000      |               |                          |
| 1.3           |                                                                                                      | 7,400      |               |                          |
| 1.4           |                                                                                                      | 6,800      |               |                          |
| 1.5           |                                                                                                      | 6,400      |               |                          |
| 1.6           |                                                                                                      | 6,000      |               |                          |
| 1.7           |                                                                                                      | 5,600      |               |                          |
| 1.8           |                                                                                                      | 5,300      |               |                          |
| 1.9           |                                                                                                      | 5,000      |               |                          |
| 2.0           |                                                                                                      | 4,800      |               |                          |
| 2.1           |                                                                                                      | 4,600      |               |                          |
| 2.2           |                                                                                                      | 4,300      |               |                          |
| 2.3           |                                                                                                      | 4,200      |               |                          |
| 2.4           |                                                                                                      | 4,000      |               |                          |
| 2.5           |                                                                                                      | 3,800      |               |                          |
| 2.6           |                                                                                                      | 3,700      |               |                          |
| 2.7           |                                                                                                      | 3,500      |               |                          |
| 2.8           |                                                                                                      | 3,400      |               |                          |
| 2.9           |                                                                                                      | 3,300      |               |                          |
| 3.0           |                                                                                                      | 3,200      |               |                          |
| Remarks       | ※ Machining must be performed using the G83 code (peck drilling cycle).                              |            |               |                          |

※ Cutting formula :  $S = Vc \times 1000 / D / \pi$  (3.14)       $F = f \times S$

1. When the sound is piercing, please lower the spindle speed(S) (10~40%).
2. When the machine is vibrating, please decrease the feed rate(F) (10~40%).
3. When the spindle load is high, please decrease the feed rate(F) (10~40%).
4. These are recommended values which depend on the condition of the machine, fixture, lubricating & cooling systems... etc. They may have to be adapted.

# Table 03

## MONOCRYSTALLINE DIAMOND SPOTTING DRILLS- CUTTING CONDITION TABLE

|               |                                                                                                      |            |               |                 |
|---------------|------------------------------------------------------------------------------------------------------|------------|---------------|-----------------|
| Material      | Ceramics (SiC, Al <sub>2</sub> O <sub>3</sub> , ZrO <sub>2</sub> ) / SiO <sub>2</sub> / Si / Carbide |            |               |                 |
| Material Code | —                                                                                                    |            |               |                 |
| Hardness      | HV≦2,500                                                                                             |            |               |                 |
| Diameter      | Vc<br>(m/min)                                                                                        | S<br>(rpm) | F<br>(mm/min) | Ap<br>(mm)      |
| 1.0           | 30                                                                                                   | 9,600      | 1~10          | ≦Cutting Length |
| 2.0           |                                                                                                      | 4,800      |               |                 |
| 3.0           |                                                                                                      | 3,200      |               |                 |
| Remarks       |                   |            |               |                 |

※ Cutting formula :  $S = Vc \times 1000 / D / \pi (3.14)$      $F = f \times S$

1. When the sound is piercing, please lower the spindle speed(S) (10~40%).
2. When the machine is vibrating, please decrease the feed rate(F) (10~40%).
3. When the spindle load is high, please decrease the feed rate(F) (10~40%).
4. These are recommended values which depend on the condition of the machine, fixture, lubricating & cooling systems... etc. They may have to be adapted.