

**YE-IS16**



***i*-Smart**

**Y-Coated Modular type End Mill**

Ultra-micro Grain Carbide Heads with  
Carbide & Steel Holders

***i*-Smart**

**Y-Coated Modular type End Mill**

Ultra-micro Grain Carbide Heads with  
Carbide & Steel Holders

► **Exchangeable Modular heads  
for Finishing & Semi-Finishing**



***YG* YG-1 CO., LTD.**

**HEAD OFFICE**

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**Note** The new address above has currently been updated since Korean new postal standard was valid from 2014.  
Be noticed that the physical Headquarter location is NOT changed.



Tool specifications are subject to change without prior notice.

YG1YEIS160823001

***YG* YG-1 CO., LTD.**

# i-Smart

Y-Coated Modular type End Mill  
(Carbide Heads with  
Carbide & Steel Holders)

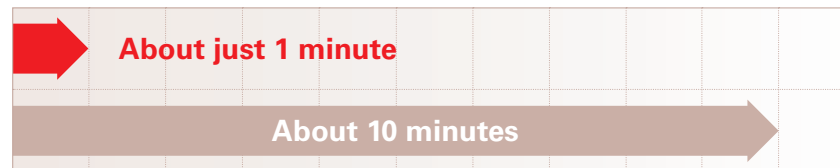
**"The most cost reducing solution with various compatibility."**

- Efficient when changing tools, compared with conventional solid end mills
- Various selections of Square, Corner radius and Ball type with 2, 4, & 6 flutes
- Longer tool life based on YG-1's advanced coating technology

## EFFICIENCY

**"You can just change the modular head spending one tenth of which you spent before on conventional solid tools."**

changing modular heads

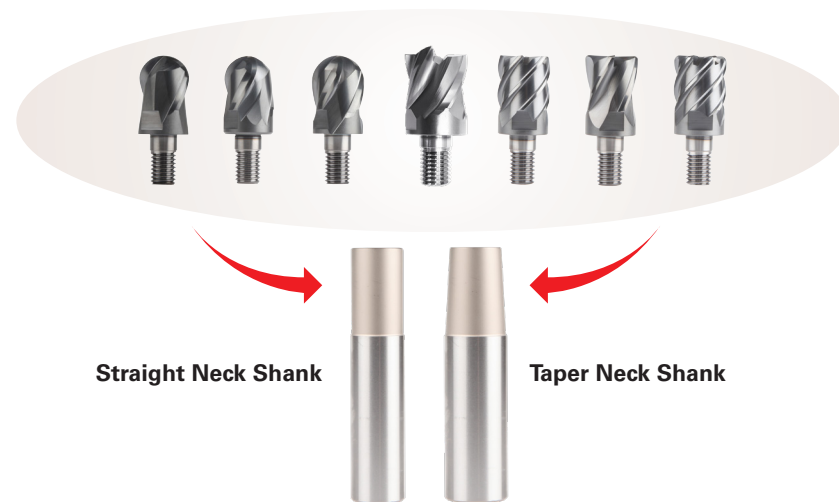


changing conventional  
Solid end mills

※Tool changing time may change depending on workers.

## VARIOUS SELECTIONS

**"Seven different selections of modular heads fit in two different shanks."**



## LONGER TOOL LIFE



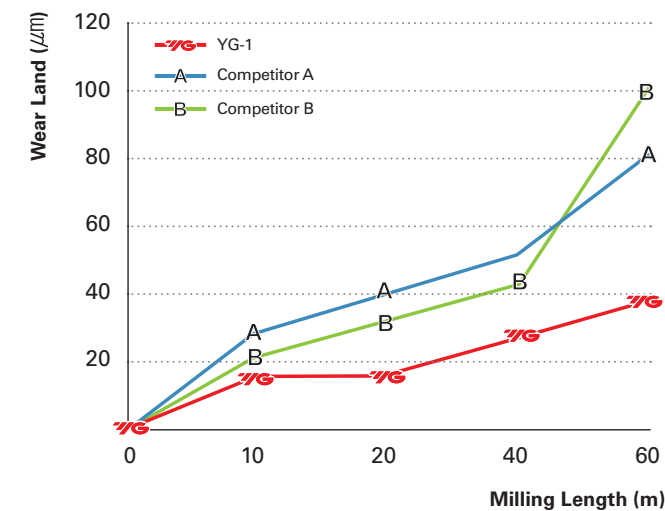
**YG-1's advanced coating technology applied;**

- Outstanding cutting abilities and wear resistance is made from new coating and new tool geometry.

**High Tech Geometry applied;**

- Multiple Helix applied to minimize vibration when cutting and to increase wear resistance.
- Optimized edge preparation increasing tool life.

## TEST REPORT

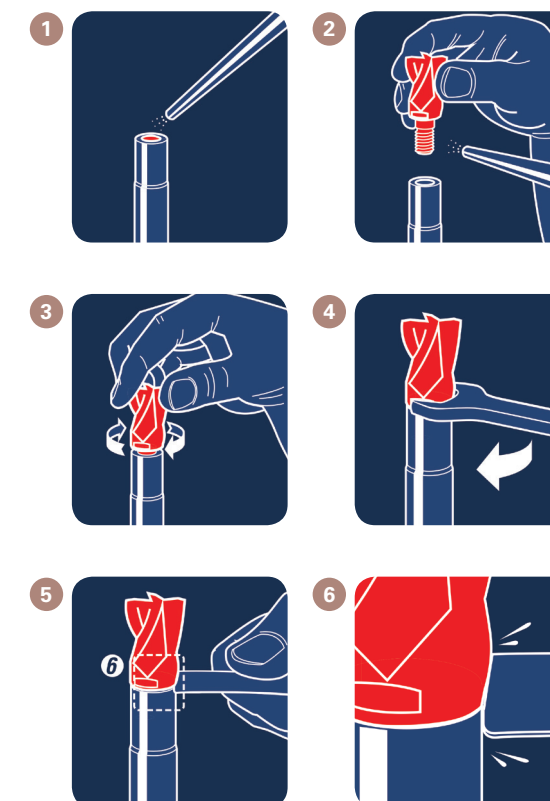


### Cutting Edges



| Cutting Conditions |                                    |                    |                                  |
|--------------------|------------------------------------|--------------------|----------------------------------|
| Tool               | 4 Flute Corner Radius, Ø16, R1.0   | Feed per tooth     | 0.02 mm/tooth                    |
| Work Material      | KP4M (HRc35 / DIN 1.2738 Improved) | Milling Method     | Down & Side Cutting              |
| Cutting Speed      | 155.82 m/min.                      | Milling Depth      | Axial : 12 mm    Radial : 0.8 mm |
| RPM                | 3100 rev./min.                     | Overhang / Coolant | 77 mm / Wet Cut                  |
| Feed               | 280 mm/min.                        | Machine            | Machining Center LCV 650         |

## INSTRUCTION MANUAL



### Step 1, 2 : Clean

Please be sure to remove dirt and debris on all adjoining surfaces before assembling. (air preferred)

### Step 3, 4 : Assembly

Mount the modular head onto the shank by hand until it fits then use the supplied wrench to tighten.

### Step 5, 6 : Final Check

Re-check that there is no gap.

| Mill Diameter<br>(ØD) | Clamping Torque<br>[ N·m ] |
|-----------------------|----------------------------|
| Ø10                   | 6.5                        |
| Ø12                   | 6.5                        |
| Ø16                   | 10.0                       |
| Ø20                   | 12.0                       |
| Ø25                   | 15.0                       |
| Ø30                   | 20.0                       |
| Ø32                   | 20.0                       |

**Notice**  
Please tighten the screw with designated torque, too much torque will damage the screw.

| ITEM           | MODEL | DESCRIPTION                                                           | SIZE |      | PAGE      |
|----------------|-------|-----------------------------------------------------------------------|------|------|-----------|
|                |       |                                                                       | Min. | Max. |           |
| <b>XSEMD98</b> |       | Y-COATED CARBIDE MODULAR HEAD<br>2 FLUTE BALL NOSE (Center Match)     | Ø10  | Ø32  | <b>5</b>  |
| <b>XSEME59</b> |       | Y-COATED CARBIDE MODULAR HEAD<br>3 FLUTE BALL NOSE (Center Match)     | Ø10  | Ø32  | <b>6</b>  |
| <b>XSEME60</b> |       | Y-COATED CARBIDE MODULAR HEAD<br>4 FLUTE BALL NOSE (Center Match)     | Ø10  | Ø32  | <b>7</b>  |
| <b>XSEME36</b> |       | Y-COATED CARBIDE MODULAR HEAD<br>4 FLUTE MULTIPLE HELIX               | Ø10  | Ø32  | <b>8</b>  |
| <b>XSEME75</b> |       | Y-COATED CARBIDE MODULAR HEAD<br>6 FLUTE 45° HELIX                    | Ø10  | Ø32  | <b>9</b>  |
| <b>XSEME01</b> |       | Y-COATED CARBIDE MODULAR HEAD<br>4 FLUTE MULTIPLE HELIX CORNER RADIUS | Ø10  | Ø32  | <b>10</b> |
| <b>XSEME68</b> |       | Y-COATED CARBIDE MODULAR HEAD<br>6 FLUTE 45° HELIX CORNER RADIUS      | Ø10  | Ø32  | <b>12</b> |
| <b>ZMC</b>     |       | CARBIDE HOLDER - Straight Neck Type                                   |      |      | <b>13</b> |
| <b>ZMS</b>     |       | STEEL HOLDER - Straight Neck Type                                     |      |      | <b>14</b> |
| <b>ZMT</b>     |       | STEEL HOLDER - Taper Neck Type                                        |      |      | <b>15</b> |

## ICON GUIDE



The tool is made of Ultra-micro Grain carbide.



No. of Flute



Helix Angle

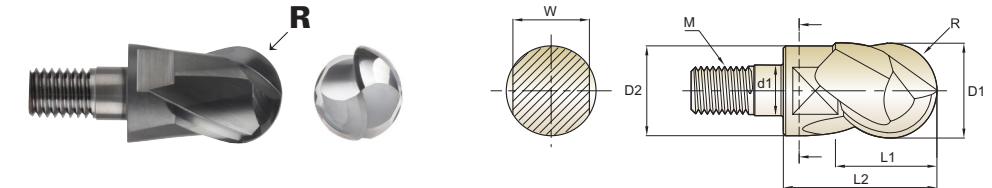


Cutting condition of tool see the page 000

Y-COATED CARBIDE MODULAR HEAD

## 2 FLUTE BALL NOSE (Center Match)

**i-Smart**  
Modular type



## XSEMD98 SERIES

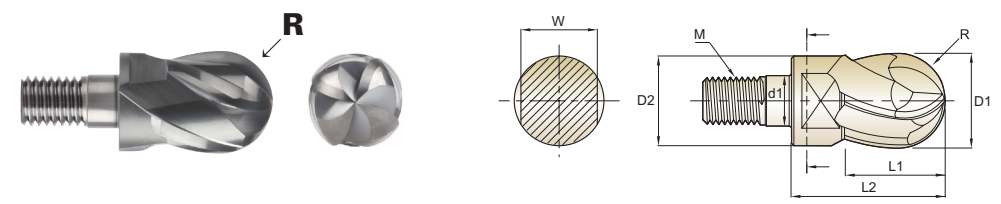
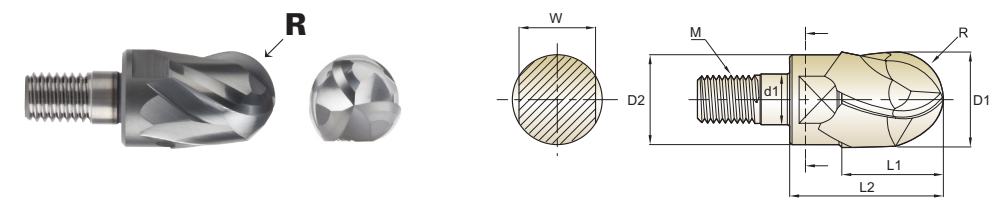


Unit : mm

| EDP No.           | Radius of Ball Nose | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Wrench Width | Coupling Diameter | Thread |
|-------------------|---------------------|---------------|---------------|---------------|--------------------|--------------|-------------------|--------|
|                   | R                   | D1            | D2            | L1            | L2                 | W            | d1                | M      |
| <b>XSEMD98100</b> | R5.0                | <b>10.0</b>   | 9             | 10            | 17.5               | 8            | 6.5               | M6     |
| <b>XSEMD98120</b> | R6.0                | <b>12.0</b>   | 11            | 12            | 20.5               | 10           |                   |        |
| <b>XSEMD98160</b> | R8.0                | <b>16.0</b>   | 15            | 16            | 25.5               | 13           |                   |        |
| <b>XSEMD98200</b> | R10.0               | <b>20.0</b>   | 19            | 20            | 30                 | 17           |                   |        |
| <b>XSEMD98250</b> | R12.5               | <b>25.0</b>   | 24            | 25            | 37                 | 22           | 16.5              | M12    |
| <b>XSEMD98300</b> | R15.0               | <b>30.0</b>   | 29            | 30            | 43                 | 27           |                   |        |
| <b>XSEMD98320</b> | R16.0               | <b>32.0</b>   | 31            | 32            | 45                 | 27           |                   |        |

| Radius Tolerance (mm) | Mill Dia. Tolerance (mm) |
|-----------------------|--------------------------|
| ± 0.010               | 0~-0.015                 |





XSEME59 SERIES



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Unit : mm

| EDP No.    | Radius of Ball Nose | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Wrench Width | Coupling Diameter | Thread |
|------------|---------------------|---------------|---------------|---------------|--------------------|--------------|-------------------|--------|
|            | R                   | D1            | D2            | L1            | L2                 | W            | d1                | M      |
| XSEME59100 | R5.0                | 10.0          | 9             | 10            | 17.5               | 8            | 6.5               | M6     |
| XSEME59120 | R6.0                | 12.0          | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME59160 | R8.0                | 16.0          | 15            | 16            | 25.5               | 13           | 8.5               | M8     |
| XSEME59200 | R10.0               | 20.0          | 19            | 20            | 30                 | 17           | 10.5              | M10    |
| XSEME59250 | R12.5               | 25.0          | 24            | 25            | 37                 | 22           | 12.5              | M12    |
| XSEME59300 | R15.0               | 30.0          | 29            | 30            | 43                 | 27           | 16.5              | M16    |
| XSEME59320 | R16.0               | 32.0          | 31            | 32            | 45                 | 27           |                   |        |

| Radius Tolerance (mm) | Mill Dia. Tolerance (mm) |
|-----------------------|--------------------------|
| ± 0.010               | 0~-0.02                  |

XSEME60 SERIES

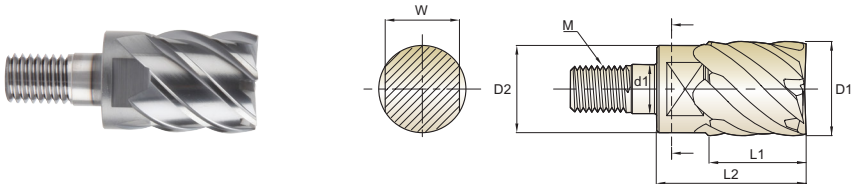
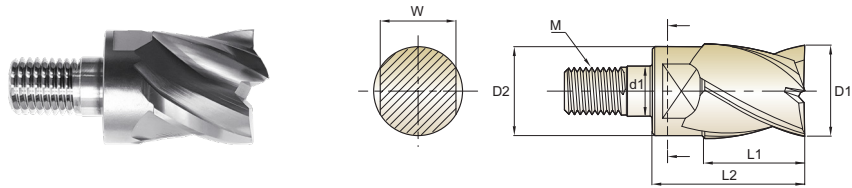


P. 17

Unit : mm

| EDP No.    | Radius of Ball Nose | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Wrench Width | Coupling Diameter | Thread |
|------------|---------------------|---------------|---------------|---------------|--------------------|--------------|-------------------|--------|
|            | R                   | D1            | D2            | L1            | L2                 | W            | d1                | M      |
| XSEME60100 | R5.0                | 10.0          | 9             | 10            | 17.5               | 8            | 6.5               | M6     |
| XSEME60120 | R6.0                | 12.0          | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME60160 | R8.0                | 16.0          | 15            | 16            | 25.5               | 13           | 8.5               | M8     |
| XSEME60200 | R10.0               | 20.0          | 19            | 20            | 30                 | 17           | 10.5              | M10    |
| XSEME60250 | R12.5               | 25.0          | 24            | 25            | 37                 | 22           | 12.5              | M12    |
| XSEME60300 | R15.0               | 30.0          | 29            | 30            | 43                 | 27           | 16.5              | M16    |
| XSEME60320 | R16.0               | 32.0          | 31            | 32            | 45                 | 27           |                   |        |

| Radius Tolerance (mm) | Mill Dia. Tolerance (mm) |
|-----------------------|--------------------------|
| ± 0.010               | 0~-0.02                  |



**XSEME36** SERIES



**XSEME75** SERIES



Unit : mm

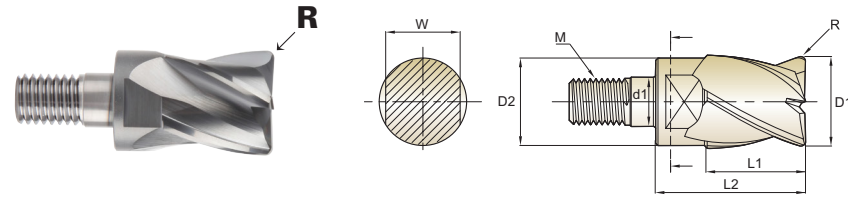
| EDP No.    | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Wrench Width | Coupling Diameter | Thread |
|------------|---------------|---------------|---------------|--------------------|--------------|-------------------|--------|
|            | D1            | D2            | L1            | L2                 | W            | d1                | M      |
| XSEME36100 | 10.0          | 9             | 10            | 17.5               | 8            | 6.5               | M6     |
| XSEME36120 | 12.0          | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME36160 | 16.0          | 15            | 16            | 25.5               | 13           | 8.5               | M8     |
| XSEME36200 | 20.0          | 19            | 20            | 30                 | 17           | 10.5              | M10    |
| XSEME36250 | 25.0          | 24            | 25            | 37                 | 22           | 12.5              | M12    |
| XSEME36300 | 30.0          | 29            | 30            | 43                 | 27           | 16.5              | M16    |
| XSEME36320 | 32.0          | 31            | 32            | 45                 | 27           |                   |        |

| Mill Dia. Tolerance (mm) |
|--------------------------|
| 0~-0.03                  |

Unit : mm

| EDP No.    | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Wrench Width | Coupling Diameter | Thread |
|------------|---------------|---------------|---------------|--------------------|--------------|-------------------|--------|
|            | D1            | D2            | L1            | L2                 | W            | d1                | M      |
| XSEME75100 | 10.0          | 9             | 10            | 17.5               | 8            | 6.5               | M6     |
| XSEME75120 | 12.0          | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME75160 | 16.0          | 15            | 16            | 25.5               | 13           | 8.5               | M8     |
| XSEME75200 | 20.0          | 19            | 20            | 30                 | 17           | 10.5              | M10    |
| XSEME75250 | 25.0          | 24            | 25            | 37                 | 22           | 12.5              | M12    |
| XSEME75300 | 30.0          | 29            | 30            | 43                 | 27           | 16.5              | M16    |
| XSEME75320 | 32.0          | 31            | 32            | 45                 | 27           |                   |        |

| Mill Dia. Tolerance (mm) |
|--------------------------|
| 0~-0.03                  |



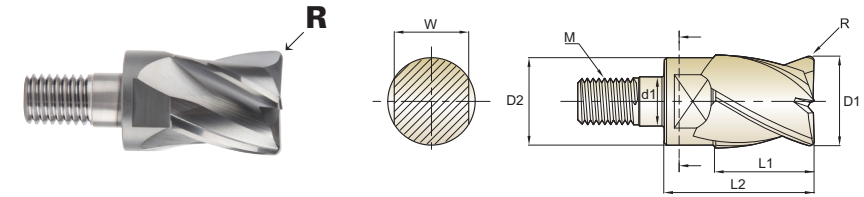
**XSEME01 SERIES**



Unit : mm

| EDP No.        | Corner Radius | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Wrench Width | Coupling Diameter | Thread |
|----------------|---------------|---------------|---------------|---------------|--------------------|--------------|-------------------|--------|
|                | R             | D1            | D2            | L1            | L2                 | W            | d1                | M      |
| XSEME01100 010 | R0.1          | 10.0          | 9             | 10            | 17.5               | 8            | 6.5               | M6     |
| XSEME01100 020 | R0.2          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01100 030 | R0.3          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01100 050 | R0.5          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01100 100 | R1.0          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01100 150 | R1.5          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01100 200 | R2.0          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01100 250 | R2.5          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01100 300 | R3.0          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01100 400 | R4.0          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME01120 010 | R0.1          | 12.0          | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 020 | R0.2          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 030 | R0.3          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 050 | R0.5          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 100 | R1.0          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 150 | R1.5          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 200 | R2.0          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 250 | R2.5          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 300 | R3.0          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 400 | R4.0          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01120 500 | R5.0          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME01160 050 | R0.5          | 16.0          | 15            | 16            | 25.5               | 13           | 8.5               | M8     |
| XSEME01160 100 | R1.0          |               | 15            | 16            | 25.5               | 13           |                   |        |
| XSEME01160 150 | R1.5          |               | 15            | 16            | 25.5               | 13           |                   |        |
| XSEME01160 200 | R2.0          |               | 15            | 16            | 25.5               | 13           |                   |        |

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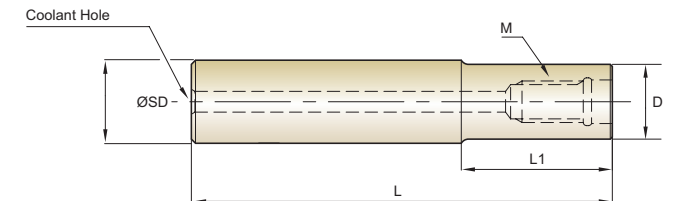
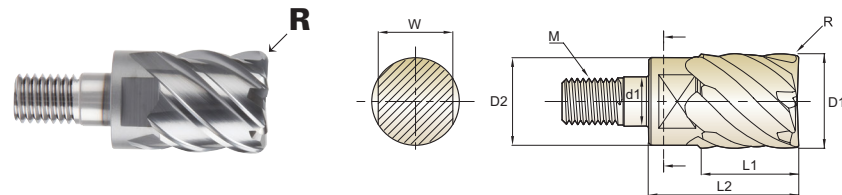
**XSEME01 SERIES**



Unit : mm

| EDP No.        | Corner Radius | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Wrench Width | Coupling Diameter | Thread |
|----------------|---------------|---------------|---------------|---------------|--------------------|--------------|-------------------|--------|
|                | R             | D1            | D2            | L1            | L2                 | W            | d1                | M      |
| XSEME01200 050 | R0.5          | 20.0          | 19            | 20            | 30                 | 17           | 10.5              | M10    |
| XSEME01200 100 | R1.0          |               | 19            | 20            | 30                 | 17           |                   |        |
| XSEME01200 150 | R1.5          |               | 19            | 20            | 30                 | 17           |                   |        |
| XSEME01200 200 | R2.0          |               | 19            | 20            | 30                 | 17           |                   |        |
| XSEME01250 050 | R0.5          | 25.0          | 24            | 25            | 37                 | 22           | 12.5              | M12    |
| XSEME01250 100 | R1.0          |               | 24            | 25            | 37                 | 22           |                   |        |
| XSEME01250 150 | R1.5          |               | 24            | 25            | 37                 | 22           |                   |        |
| XSEME01250 200 | R2.0          |               | 24            | 25            | 37                 | 22           |                   |        |
| XSEME01300 050 | R0.5          | 30.0          | 29            | 30            | 43                 | 27           | 16.5              | M16    |
| XSEME01300 100 | R1.0          |               | 29            | 30            | 43                 | 27           |                   |        |
| XSEME01300 150 | R1.5          |               | 29            | 30            | 43                 | 27           |                   |        |
| XSEME01300 200 | R2.0          |               | 29            | 30            | 43                 | 27           |                   |        |
| XSEME01320 050 | R0.5          | 32.0          | 31            | 32            | 45                 | 27           |                   |        |
| XSEME01320 100 | R1.0          |               | 31            | 32            | 45                 | 27           |                   |        |
| XSEME01320 150 | R1.5          |               | 31            | 32            | 45                 | 27           |                   |        |
| XSEME01320 200 | R2.0          |               | 31            | 32            | 45                 | 27           |                   |        |

| Comer Radius Tolerance (mm) | Mill Dia. Tolerance (mm) |
|-----------------------------|--------------------------|
| ± 0.02                      | 0~-0.03                  |



**XSEME68 SERIES**



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Unit : mm

| EDP No.        | Corner Radius | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Wrench Width | Coupling Diameter | Thread |
|----------------|---------------|---------------|---------------|---------------|--------------------|--------------|-------------------|--------|
|                | R             | D1            | D2            | L1            | L2                 | W            | d1                | M      |
| XSEME68100 030 | R0.3          | 10.0          | 9             | 10            | 17.5               | 8            | 6.5               | M6     |
| XSEME68100 050 | R0.5          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME68100 100 | R1.0          |               | 9             | 10            | 17.5               | 8            |                   |        |
| XSEME68120 030 | R0.3          | 12.0          | 11            | 12            | 20.5               | 10           | 6.5               | M6     |
| XSEME68120 050 | R0.5          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME68120 100 | R1.0          |               | 11            | 12            | 20.5               | 10           |                   |        |
| XSEME68160 050 | R0.5          | 16.0          | 15            | 16            | 25.5               | 13           | 8.5               | M8     |
| XSEME68160 100 | R1.0          |               | 15            | 16            | 25.5               | 13           |                   |        |
| XSEME68160 150 | R1.5          |               | 15            | 16            | 25.5               | 13           |                   |        |
| XSEME68160 200 | R2.0          |               | 15            | 16            | 25.5               | 13           |                   |        |
| XSEME68200 050 | R0.5          | 20.0          | 19            | 20            | 30                 | 17           | 10.5              | M10    |
| XSEME68200 100 | R1.0          |               | 19            | 20            | 30                 | 17           |                   |        |
| XSEME68200 150 | R1.5          |               | 19            | 20            | 30                 | 17           |                   |        |
| XSEME68200 200 | R2.0          |               | 19            | 20            | 30                 | 17           |                   |        |
| XSEME68250 050 | R0.5          | 25.0          | 24            | 25            | 37                 | 22           | 12.5              | M12    |
| XSEME68250 100 | R1.0          |               | 24            | 25            | 37                 | 22           |                   |        |
| XSEME68250 150 | R1.5          |               | 24            | 25            | 37                 | 22           |                   |        |
| XSEME68250 200 | R2.0          |               | 24            | 25            | 37                 | 22           |                   |        |
| XSEME68300 050 | R0.5          | 30.0          | 29            | 30            | 43                 | 27           | 16.5              | M16    |
| XSEME68300 100 | R1.0          |               | 29            | 30            | 43                 | 27           |                   |        |
| XSEME68300 150 | R1.5          |               | 29            | 30            | 43                 | 27           |                   |        |
| XSEME68300 200 | R2.0          |               | 29            | 30            | 43                 | 27           |                   |        |
| XSEME68320 050 | R0.5          | 32.0          | 31            | 32            | 45                 | 27           | 16.5              | M16    |
| XSEME68320 100 | R1.0          |               | 31            | 32            | 45                 | 27           |                   |        |
| XSEME68320 150 | R1.5          |               | 31            | 32            | 45                 | 27           |                   |        |
| XSEME68320 200 | R2.0          |               | 31            | 32            | 45                 | 27           |                   |        |

| Corner Radius Tolerance (mm) | Mill Dia. Tolerance (mm) |
|------------------------------|--------------------------|
| ± 0.015                      | 0~-0.03                  |

**ZMC SERIES**

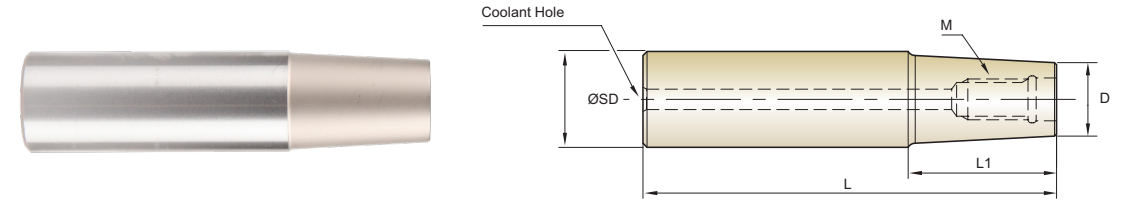
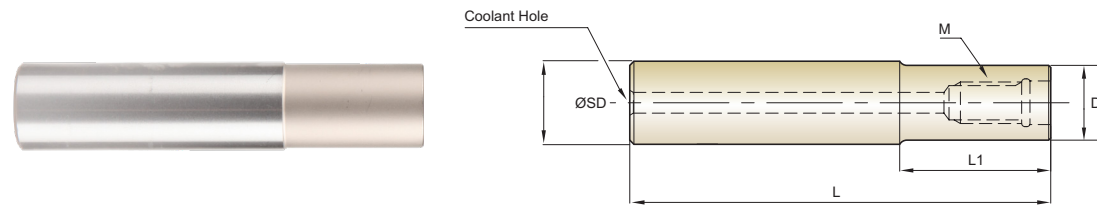
**Straight Neck Type**

Unit : mm

| EDP No.    | Mill Diameter | Shank Diameter | Overall Length | Neck Length | Neck Diameter | Thread Size | Wrench No. | Coolant Hole |
|------------|---------------|----------------|----------------|-------------|---------------|-------------|------------|--------------|
|            |               | SD             | L              | L1          | D             | M           |            |              |
| ZMC1001100 | 10.0          | 10.0           | 70             | 20          | 9.5           | M6          | SPIS0810   | Ø2           |
| ZMC1002100 |               |                | 100            | 40          |               |             |            |              |
| ZMC1003100 |               |                | 130            | 70          |               |             |            |              |
| ZMC1201120 | 12.0          | 12.0           | 80             | 20          | 11.5          | M6          | SPIS0810   | Ø2           |
| ZMC1202120 |               |                | 100            | 40          |               |             |            |              |
| ZMC1203120 |               |                | 130            | 70          |               |             |            |              |
| ZMC1601160 | 16.0          | 16.0           | 100            | 40          | 15.5          | M8          | SPIS1300   | Ø3           |
| ZMC1602160 |               |                | 150            | 80          |               |             |            |              |
| ZMC1603160 |               |                | 200            | 120         |               |             |            |              |
| ZMC2001200 | 20.0          | 20.0           | 100            | 40          | 19.5          | M10         | SPIS1700   | Ø4           |
| ZMC2002200 |               |                | 150            | 80          |               |             |            |              |
| ZMC2003200 |               |                | 200            | 120         |               |             |            |              |
| ZMC2004200 | 25.0          | 25.0           | 250            | 160         | 24.3          | M12         | SPIS2200   | Ø5           |
| ZMC2501250 |               |                | 150            | 70          |               |             |            |              |
| ZMC2502250 |               |                | 200            | 100         |               |             |            |              |
| ZMC2503250 |               |                | 250            | 150         |               |             |            |              |
| ZMC2504250 | 30.0 / 32.0   | 32.0           | 300            | 200         | 29.0          | M16         | SPIS2700   | Ø6           |
| ZMC3001320 |               |                | 150            | 70          |               |             |            |              |
| ZMC3002320 |               |                | 200            | 120         |               |             |            |              |
| ZMC3003320 |               |                | 250            | 150         |               |             |            |              |
| ZMC3004320 |               |                | 300            | 200         |               |             |            |              |
| ZMC3005320 |               |                | 350            | 250         |               |             |            |              |

►The wrench(1pc) for the relevant item is included.  
If more is needed, available for sale.

►Please refer to the wrench table on page 14.



## ZMS SERIES

Straight Neck Type

Unit : mm

| EDP No.           | Mill Diameter      | Shank Diameter | Overall Length | Neck Length | Neck Diameter | Thread Size | Wrench No. | Coolant Hole |
|-------------------|--------------------|----------------|----------------|-------------|---------------|-------------|------------|--------------|
|                   |                    | SD             | L              | L1          | D             | M           |            |              |
| <b>ZMS1001100</b> | <b>10.0</b>        | 10.0           | 70.0           | 20.0        | 9.0           | M6          | SPIS0810   | Ø3           |
| <b>ZMS1201120</b> | <b>12.0</b>        | 12.0           | 90.0           | 30.0        | 11.0          | M6          |            | Ø3           |
| <b>ZMS1601160</b> | <b>16.0</b>        | 16.0           | 100.0          | 30.0        | 15.0          | M8          | SPIS1300   | Ø4           |
| <b>ZMS2001200</b> | <b>20.0</b>        | 20.0           | 100.0          | 30.0        | 19.0          | M10         | SPIS1700   | Ø5           |
| <b>ZMS2501250</b> | <b>25.0</b>        | 25.0           | 115.0          | 40.0        | 24.0          | M12         | SPIS2200   | Ø5           |
| <b>ZMS3001320</b> | <b>30.0 / 32.0</b> | 32.0           | 125.0          | 40.0        | 29.0          | M16         | SPIS2700   | Ø6           |

►The wrench(1pc) for the relevant item is included.  
If more is needed, available for sale.

## Wrench

| Model                                                                               | Wrench No. | Wrench Width | Mill Diameter  | Clamping Torque [N·m] |
|-------------------------------------------------------------------------------------|------------|--------------|----------------|-----------------------|
|  | SPIS0810   | 8            | Ø10.0          | 6.5                   |
|                                                                                     |            | 10           | Ø12.0          | 6.5                   |
|  | SPIS1300   | 13           | Ø16.0          | 10                    |
|  | SPIS1700   | 17           | Ø20.0          | 12                    |
|  | SPIS2200   | 22           | Ø25.0          | 15                    |
|  | SPIS2700   | 27           | Ø30.0<br>Ø32.0 | 20                    |

## ZMT SERIES

Taper Neck Type

Unit : mm

| EDP No.           | Mill Diameter      | Shank Diameter | Overall Length | Neck Length | Neck Diameter | Thread Size | Wrench No. | Coolant Hole |
|-------------------|--------------------|----------------|----------------|-------------|---------------|-------------|------------|--------------|
|                   |                    | SD             | L              | L1          | D             | M           |            |              |
| <b>ZMT1001120</b> | <b>10.0</b>        | 12.0           | 100.0          | 50.0        | 9.0           | M6          | SPIS0810   | Ø3           |
| <b>ZMT1201160</b> | <b>12.0</b>        | 16.0           | 130.0          | 70.0        | 11.0          | M6          |            | Ø3           |
| <b>ZMT1601200</b> | <b>16.0</b>        | 20.0           | 150.0          | 90.0        | 15.0          | M8          | SPIS1300   | Ø4           |
| <b>ZMT2001250</b> | <b>20.0</b>        | 25.0           | 170.0          | 100.0       | 19.0          | M10         | SPIS1700   | Ø5           |
| <b>ZMT2501320</b> | <b>25.0</b>        | 32.0           | 200.0          | 110.0       | 24.0          | M12         | SPIS2200   | Ø5           |
| <b>ZMT3001320</b> | <b>30.0 / 32.0</b> | 32.0           | 200.0          | 110.0       | 29.0          | M16         | SPIS2700   | Ø6           |

►The wrench(1pc) for the relevant item is included.  
If more is needed, available for sale.

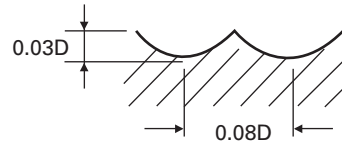
## Wrench

| Model                                                                                 | Wrench No. | Wrench Width | Mill Diameter  | Clamping Torque [N·m] |
|---------------------------------------------------------------------------------------|------------|--------------|----------------|-----------------------|
|  | SPIS0810   | 8            | Ø10.0          | 6.5                   |
|                                                                                       |            | 10           | Ø12.0          | 6.5                   |
|  | SPIS1300   | 13           | Ø16.0          | 10                    |
|  | SPIS1700   | 17           | Ø20.0          | 12                    |
|  | SPIS2200   | 22           | Ø25.0          | 15                    |
|  | SPIS2700   | 27           | Ø30.0<br>Ø32.0 | 20                    |



**XSEMD98 - 2 FLUTE BALL NOSE (Center Match)**

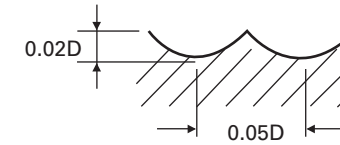
| Material | P                                               |      |     |       |                                       |      |     |       |                              |      |     |       |
|----------|-------------------------------------------------|------|-----|-------|---------------------------------------|------|-----|-------|------------------------------|------|-----|-------|
|          | Non-Alloyed Steels<br>Alloy Steels<br>Cast Iron |      |     |       | Alloy Steels<br>Heat Resistant Steels |      |     |       | Hardened Steels              |      |     |       |
| Hardness | ~ HRc35                                         |      |     |       | HRc35 ~ HRc45                         |      |     |       | HRc45 ~ HRc55                |      |     |       |
| Strength | ~ 1100N/mm <sup>2</sup>                         |      |     |       | 1100 ~ 1500N/mm <sup>2</sup>          |      |     |       | 1500 ~ 2000N/mm <sup>2</sup> |      |     |       |
| Diameter | RPM                                             | FEED | Vc  | Fz    | RPM                                   | FEED | Vc  | Fz    | RPM                          | FEED | Vc  | Fz    |
| 10.0     | 5580                                            | 2220 | 175 | 0.199 | 5340                                  | 1860 | 168 | 0.174 | 4500                         | 1440 | 141 | 0.160 |
| 12.0     | 4170                                            | 1770 | 157 | 0.212 | 4000                                  | 1500 | 151 | 0.188 | 3360                         | 1140 | 127 | 0.170 |
| 16.0     | 3340                                            | 1590 | 168 | 0.238 | 3210                                  | 1320 | 161 | 0.206 | 2700                         | 1020 | 136 | 0.189 |
| 20.0     | 2670                                            | 1410 | 168 | 0.264 | 2580                                  | 1170 | 162 | 0.227 | 2160                         | 900  | 136 | 0.208 |
| 25.0     | 2130                                            | 1150 | 167 | 0.270 | 2060                                  | 950  | 162 | 0.231 | 1730                         | 730  | 136 | 0.211 |
| 30.0     | 1770                                            | 1060 | 167 | 0.299 | 1720                                  | 860  | 162 | 0.250 | 1440                         | 660  | 136 | 0.229 |
| 32.0     | 1660                                            | 995  | 167 | 0.300 | 1610                                  | 805  | 162 | 0.250 | 1350                         | 620  | 136 | 0.230 |



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
Fz = mm/tooth

**XSEME60 - 4 FLUTE BALL NOSE (Center Match)**

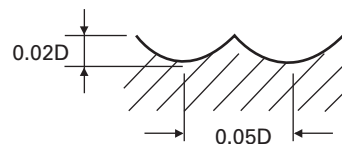
| Material | P                                               |      |     |       |                                       |      |     |       |                              |      |     |       |
|----------|-------------------------------------------------|------|-----|-------|---------------------------------------|------|-----|-------|------------------------------|------|-----|-------|
|          | Non-Alloyed Steels<br>Alloy Steels<br>Cast Iron |      |     |       | Alloy Steels<br>Heat Resistant Steels |      |     |       | Hardened Steels              |      |     |       |
| Strength | ~ 1100N/mm <sup>2</sup>                         |      |     |       | 1100 ~ 1500N/mm <sup>2</sup>          |      |     |       | 1500 ~ 2000N/mm <sup>2</sup> |      |     |       |
| Diameter | RPM                                             | FEED | Vc  | Fz    | RPM                                   | FEED | Vc  | Fz    | RPM                          | FEED | Vc  | Fz    |
| 10       | 10850                                           | 6430 | 341 | 0.148 | 9100                                  | 4590 | 286 | 0.126 | 7350                         | 3450 | 231 | 0.117 |
| 12       | 9050                                            | 5960 | 341 | 0.165 | 7590                                  | 4260 | 286 | 0.140 | 6130                         | 3190 | 231 | 0.130 |
| 16       | 6780                                            | 4750 | 341 | 0.175 | 5680                                  | 3390 | 286 | 0.149 | 4600                         | 2490 | 231 | 0.135 |
| 20       | 5430                                            | 3880 | 341 | 0.179 | 4550                                  | 2840 | 286 | 0.156 | 3680                         | 2100 | 231 | 0.143 |
| 25       | 4340                                            | 3230 | 341 | 0.186 | 3640                                  | 2390 | 286 | 0.164 | 2940                         | 1760 | 231 | 0.150 |
| 30       | 3620                                            | 2810 | 341 | 0.194 | 3030                                  | 2090 | 286 | 0.172 | 2450                         | 1540 | 231 | 0.157 |
| 32       | 3390                                            | 2720 | 341 | 0.201 | 2840                                  | 2000 | 286 | 0.176 | 2300                         | 1520 | 231 | 0.165 |



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
Fz = mm/tooth

**XSEME59 - 3 FLUTE BALL NOSE (Center Match)**

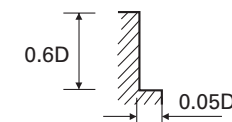
| Material | P                                               |      |     |       |                                       |      |     |       |                              |      |     |       |
|----------|-------------------------------------------------|------|-----|-------|---------------------------------------|------|-----|-------|------------------------------|------|-----|-------|
|          | Non-Alloyed Steels<br>Alloy Steels<br>Cast Iron |      |     |       | Alloy Steels<br>Heat Resistant Steels |      |     |       | Hardened Steels              |      |     |       |
| Strength | ~ 1100N/mm <sup>2</sup>                         |      |     |       | 1100 ~ 1500N/mm <sup>2</sup>          |      |     |       | 1500 ~ 2000N/mm <sup>2</sup> |      |     |       |
| Diameter | RPM                                             | FEED | Vc  | Fz    | RPM                                   | FEED | Vc  | Fz    | RPM                          | FEED | Vc  | Fz    |
| 10       | 9720                                            | 5870 | 305 | 0.201 | 8190                                  | 4130 | 257 | 0.168 | 6620                         | 3100 | 208 | 0.156 |
| 12       | 8150                                            | 5490 | 307 | 0.225 | 6830                                  | 3830 | 257 | 0.187 | 5520                         | 2870 | 208 | 0.173 |
| 16       | 6100                                            | 4280 | 307 | 0.234 | 5110                                  | 3050 | 257 | 0.199 | 4140                         | 2240 | 208 | 0.180 |
| 20       | 4880                                            | 3490 | 307 | 0.238 | 4090                                  | 2560 | 257 | 0.209 | 3310                         | 1890 | 208 | 0.190 |
| 25       | 3910                                            | 2910 | 307 | 0.248 | 3270                                  | 2150 | 257 | 0.219 | 2650                         | 1590 | 208 | 0.200 |
| 30       | 3260                                            | 2530 | 307 | 0.259 | 2730                                  | 1880 | 257 | 0.230 | 2210                         | 1390 | 208 | 0.210 |
| 32       | 3050                                            | 2450 | 307 | 0.268 | 2560                                  | 1800 | 257 | 0.234 | 2070                         | 1370 | 208 | 0.221 |



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
Fz = mm/tooth

**XSEME36 - 4 FLUTE MULTIPLE HELIX**

| Material | P                                               |      |     |       |                                       |      |    |       |                              |      |    |       | M                |      |    |       |
|----------|-------------------------------------------------|------|-----|-------|---------------------------------------|------|----|-------|------------------------------|------|----|-------|------------------|------|----|-------|
|          | Non-Alloyed Steels<br>Alloy Steels<br>Cast Iron |      |     |       | Alloy Steels<br>Heat Resistant Steels |      |    |       | Hardened Steels              |      |    |       | Stainless Steels |      |    |       |
| Hardness | ~ HRC35                                         |      |     |       | HRC35 ~ HRC45                         |      |    |       | HRC45 ~ HRC55                |      |    |       |                  |      |    |       |
| Strength | ~ 1100N/mm <sup>2</sup>                         |      |     |       | 1100 ~ 1500N/mm <sup>2</sup>          |      |    |       | 1500 ~ 2000N/mm <sup>2</sup> |      |    |       |                  |      |    |       |
| Diameter | RPM                                             | FEED | Vc  | Fz    | RPM                                   | FEED | Vc | Fz    | RPM                          | FEED | Vc | Fz    | RPM              | FEED | Vc | Fz    |
| 10.0     | 4080                                            | 640  | 128 | 0.039 | 2500                                  | 300  | 79 | 0.030 | 1700                         | 90   | 53 | 0.013 | 2100             | 300  | 66 | 0.036 |
| 12.0     | 3430                                            | 545  | 129 | 0.040 | 2100                                  | 250  | 79 | 0.030 | 1450                         | 80   | 55 | 0.014 | 1700             | 240  | 64 | 0.035 |
| 16.0     | 2750                                            | 440  | 138 | 0.040 | 1700                                  | 205  | 85 | 0.030 | 1130                         | 60   | 57 | 0.013 | 1380             | 200  | 69 | 0.036 |
| 20.0     | 2100                                            | 335  | 132 | 0.040 | 1330                                  | 160  | 84 | 0.030 | 850                          | 40   | 53 | 0.012 | 1050             | 150  | 66 | 0.036 |
| 25.0     | 1700                                            | 265  | 134 | 0.039 | 1050                                  | 130  | 82 | 0.031 | 680                          | 30   | 53 | 0.011 | 850              | 120  | 67 | 0.035 |
| 30.0     | 1420                                            | 230  | 134 | 0.040 | 870                                   | 110  | 82 | 0.032 | 560                          | 25   | 53 | 0.011 | 710              | 100  | 67 | 0.035 |
| 32.0     | 1330                                            | 215  | 134 | 0.040 | 820                                   | 105  | 82 | 0.032 | 530                          | 25   | 53 | 0.012 | 670              | 95   | 67 | 0.035 |

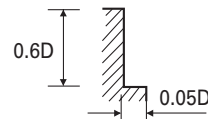
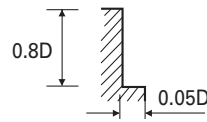
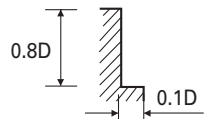


RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
Fz = mm/tooth

## XSEME75 - 6 FLUTE 45° HELIX

## NORMAL SPEED

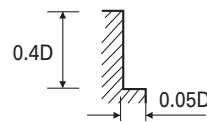
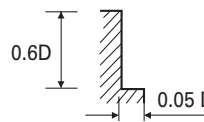
| Material | P                                               |      |     |       |                                       |      |    |       |                              |      |    |       |
|----------|-------------------------------------------------|------|-----|-------|---------------------------------------|------|----|-------|------------------------------|------|----|-------|
|          | Non-Alloyed Steels<br>Alloy Steels<br>Cast Iron |      |     |       | Alloy Steels<br>Heat Resistant Steels |      |    |       | Hardened Steels              |      |    |       |
| Hardness | ~ HRc35                                         |      |     |       | HRc35 ~ HRc45                         |      |    |       | HRc45 ~ HRc55                |      |    |       |
| Strength | ~ 1100N/mm <sup>2</sup>                         |      |     |       | 1100 ~ 1500N/mm <sup>2</sup>          |      |    |       | 1500 ~ 2000N/mm <sup>2</sup> |      |    |       |
| Diameter | RPM                                             | FEED | Vc  | Fz    | RPM                                   | FEED | Vc | Fz    | RPM                          | FEED | Vc | Fz    |
| 10.0     | 3530                                            | 2100 | 111 | 0.099 | 2435                                  | 1370 | 76 | 0.094 | 1050                         | 210  | 33 | 0.033 |
| 12.0     | 2980                                            | 1765 | 112 | 0.099 | 2100                                  | 1160 | 79 | 0.092 | 880                          | 180  | 33 | 0.034 |
| 16.0     | 2205                                            | 1325 | 111 | 0.100 | 1555                                  | 880  | 78 | 0.094 | 670                          | 130  | 34 | 0.032 |
| 20.0     | 1765                                            | 1060 | 111 | 0.100 | 1220                                  | 690  | 77 | 0.094 | 525                          | 110  | 33 | 0.035 |
| 25.0     | 1410                                            | 845  | 111 | 0.100 | 980                                   | 555  | 77 | 0.094 | 420                          | 85   | 33 | 0.034 |
| 30.0     | 1180                                            | 710  | 111 | 0.100 | 820                                   | 460  | 77 | 0.093 | 350                          | 75   | 33 | 0.036 |
| 32.0     | 1100                                            | 660  | 111 | 0.100 | 765                                   | 430  | 77 | 0.094 | 330                          | 70   | 33 | 0.035 |



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
Fz = mm/tooth

## HIGH SPEED

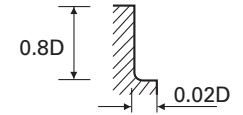
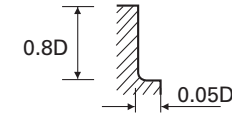
| Material | P                                               |      |     |       |                              |      |     |       |
|----------|-------------------------------------------------|------|-----|-------|------------------------------|------|-----|-------|
|          | Non-Alloyed Steels<br>Alloy Steels<br>Cast Iron |      |     |       | Hardened Steels              |      |     |       |
| Hardness | ~ HRc50                                         |      |     |       | HRc50~ HRc60                 |      |     |       |
| Strength | 1750N/mm <sup>2</sup>                           |      |     |       | 1750 ~ 2080N/mm <sup>2</sup> |      |     |       |
| Diameter | RPM                                             | FEED | Vc  | Fz    | RPM                          | FEED | Vc  | Fz    |
| 10.0     | 10480                                           | 5990 | 329 | 0.095 | 5290                         | 3050 | 166 | 0.096 |
| 12.0     | 8820                                            | 5040 | 333 | 0.095 | 4410                         | 2520 | 166 | 0.095 |
| 16.0     | 6615                                            | 3780 | 333 | 0.095 | 3320                         | 1890 | 167 | 0.095 |
| 20.0     | 5290                                            | 3050 | 332 | 0.096 | 2645                         | 1470 | 166 | 0.093 |
| 25.0     | 4230                                            | 2400 | 332 | 0.095 | 2114                         | 1200 | 166 | 0.095 |
| 30.0     | 3520                                            | 2000 | 332 | 0.095 | 1761                         | 1000 | 166 | 0.095 |
| 32.0     | 3300                                            | 1890 | 332 | 0.095 | 1651                         | 940  | 166 | 0.095 |



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
Fz = mm/tooth

## XSEME01 - 4 FLUTE MULTIPLE HELIX CORNER RADIUS

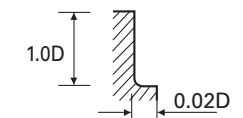
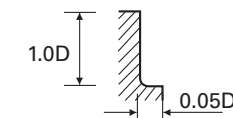
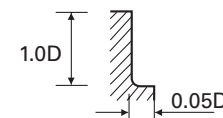
| Material | P                                               |      |     |       |                                       |      |     |       |                              |      |    |       |
|----------|-------------------------------------------------|------|-----|-------|---------------------------------------|------|-----|-------|------------------------------|------|----|-------|
|          | Non-Alloyed Steels<br>Alloy Steels<br>Cast Iron |      |     |       | Alloy Steels<br>Heat Resistant Steels |      |     |       | Hardened Steels              |      |    |       |
| Hardness | ~ HRc35                                         |      |     |       | HRc35 ~ HRc45                         |      |     |       | HRc45 ~ HRc55                |      |    |       |
| Strength | ~ 1100N/mm <sup>2</sup>                         |      |     |       | 1100 ~ 1500N/mm <sup>2</sup>          |      |     |       | 1500 ~ 2000N/mm <sup>2</sup> |      |    |       |
| Diameter | RPM                                             | FEED | Vc  | Fz    | RPM                                   | FEED | Vc  | Fz    | RPM                          | FEED | Vc | Fz    |
| 10.0     | 5040                                            | 460  | 158 | 0.023 | 3280                                  | 360  | 103 | 0.027 | 2020                         | 170  | 63 | 0.021 |
| 12.0     | 4120                                            | 360  | 155 | 0.022 | 2780                                  | 320  | 105 | 0.029 | 1680                         | 140  | 63 | 0.021 |
| 16.0     | 3100                                            | 280  | 156 | 0.023 | 2100                                  | 230  | 106 | 0.027 | 1280                         | 115  | 64 | 0.022 |
| 20.0     | 2520                                            | 230  | 158 | 0.023 | 1640                                  | 180  | 103 | 0.027 | 1000                         | 90   | 63 | 0.023 |
| 25.0     | 1990                                            | 180  | 156 | 0.023 | 1340                                  | 145  | 105 | 0.027 | 800                          | 75   | 63 | 0.023 |
| 30.0     | 1650                                            | 150  | 156 | 0.023 | 1110                                  | 120  | 105 | 0.027 | 670                          | 65   | 63 | 0.024 |
| 32.0     | 1550                                            | 140  | 156 | 0.023 | 1040                                  | 110  | 105 | 0.026 | 630                          | 60   | 63 | 0.024 |



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
Fz = mm/tooth

## XSEME68 - 6 FLUTE 45° HELIX CORNER RADIUS

| Material | P                                               |      |     |       |                                       |      |     |       |                              |      |     |       |
|----------|-------------------------------------------------|------|-----|-------|---------------------------------------|------|-----|-------|------------------------------|------|-----|-------|
|          | Non-Alloyed Steels<br>Alloy Steels<br>Cast Iron |      |     |       | Alloy Steels<br>Heat Resistant Steels |      |     |       | Hardened Steels              |      |     |       |
| Hardness | ~ HRc35                                         |      |     |       | HRc35 ~ HRc45                         |      |     |       | HRc45 ~ HRc55                |      |     |       |
| Strength | ~ 1100N/mm <sup>2</sup>                         |      |     |       | 1100 ~ 1500N/mm <sup>2</sup>          |      |     |       | 1500 ~ 2000N/mm <sup>2</sup> |      |     |       |
| Diameter | RPM                                             | FEED | Vc  | Fz    | RPM                                   | FEED | Vc  | Fz    | RPM                          | FEED | Vc  | Fz    |
| 10.0     | 9600                                            | 2940 | 302 | 0.051 | 9300                                  | 1370 | 292 | 0.025 | 5700                         | 210  | 179 | 0.006 |
| 12.0     | 7800                                            | 2700 | 294 | 0.058 | 7500                                  | 1160 | 283 | 0.026 | 4800                         | 180  | 181 | 0.006 |
| 16.0     | 6000                                            | 2400 | 302 | 0.067 | 5820                                  | 880  | 293 | 0.025 | 3600                         | 130  | 181 | 0.006 |
| 20.0     | 4800                                            | 2010 | 302 | 0.070 | 4680                                  | 690  | 294 | 0.025 | 2880                         | 110  | 181 | 0.006 |
| 25.0     | 3850                                            | 1615 | 302 | 0.070 | 3740                                  | 600  | 294 | 0.027 | 2305                         | 90   | 181 | 0.007 |
| 30.0     | 3200                                            | 1440 | 302 | 0.075 | 3120                                  | 540  | 294 | 0.029 | 1920                         | 85   | 181 | 0.007 |
| 32.0     | 3000                                            | 1350 | 302 | 0.075 | 2920                                  | 525  | 294 | 0.030 | 1800                         | 80   | 181 | 0.007 |



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
Fz = mm/tooth