

# Sumi Dual Mill **DMSW** Series

High-Productivity High-Feed Cutter for Rough Milling



**6-cornered Inserts**  
**Double-sided Inserts**

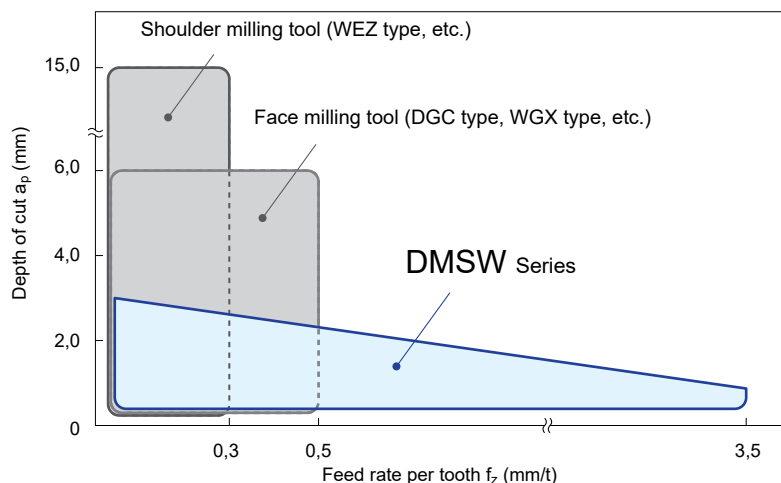
# Sumi Dual Mill DMSW Series



## General Features

- High productivity thanks to an ultra-high metal removal rate as well as high economic efficiency, due to the stable six-edged insert.
- The arc-shaped cutting edge reduces the cutting force to a minimum. High-efficiency machining at maximum feed rate per tooth of 3,5 mm/t is possible.

## Application Range



- Cutting depths up to 3 mm can be achieved. Feed rate per tooth up to 3,5 mm/t.
- Increases productivity.

## Product Range

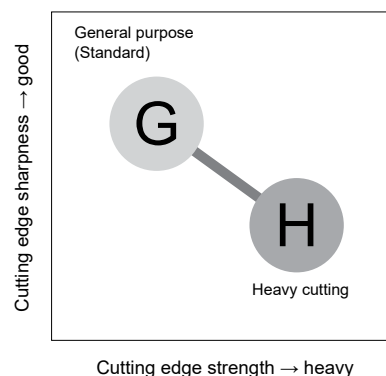
| Type    | Cat. No.           | Diameter range (mm) / No of teeth |     |     |        |        |               |        |        |        |      |      |      | Shape |
|---------|--------------------|-----------------------------------|-----|-----|--------|--------|---------------|--------|--------|--------|------|------|------|-------|
|         |                    | Ø35                               | Ø40 | Ø42 | Ø50    | Ø52    | Ø63           | Ø66    | Ø80    | Ø85    | Ø100 | Ø125 | Ø160 |       |
| Shell   | DMSW 08000RS       |                                   |     |     | 4<br>5 | 4<br>5 | 4<br>5*<br>6* | 5<br>6 | 6<br>8 | 6<br>8 | 6    | 8    | 10   |       |
|         | DMSW 08000R (Inch) |                                   |     |     | 4<br>5 |        | 4<br>5<br>6   |        | 6<br>8 |        | 6    | 8    | 10   |       |
| Shank   | DMSW 08000E        | 2                                 | 3   |     | 3      |        | 4             |        |        |        |      |      |      |       |
|         | DMSW 08000EL       | 2                                 | 3   |     | 3      |        | 4             |        |        |        |      |      |      |       |
| Modular | DMSW 08000M        | 2                                 | 3   | 3   |        |        |               |        |        |        |      |      |      |       |

\* Different shank diameters in stock

## Chipbreaker

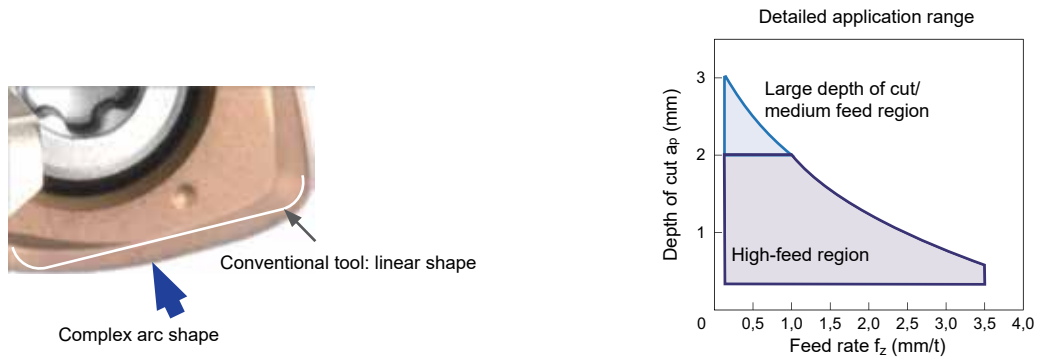
| Work Material              | P Steel                                                 | M Stainless steel | K Cast iron | P Steel                                                        | M Stainless steel | K Cast iron |
|----------------------------|---------------------------------------------------------|-------------------|-------------|----------------------------------------------------------------|-------------------|-------------|
| Applications               | Main chipbreaker general-purpose to interrupted milling |                   |             | Roughing, heavy interrupted cutting and hardened steel milling |                   |             |
|                            | General purpose                                         |                   |             | High strength                                                  |                   |             |
| Chip breaker               | G type                                                  |                   |             | H type                                                         |                   |             |
|                            |                                                         |                   |             |                                                                |                   |             |
| Cutting edge cross section |                                                         |                   |             |                                                                |                   |             |

## Chipbreaker Selection Guide

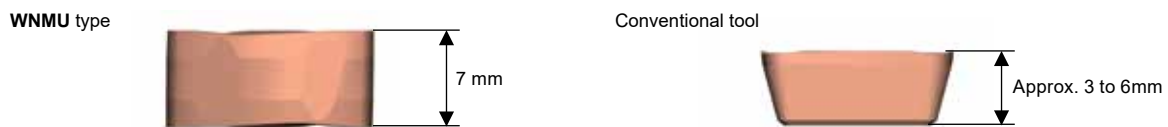


## ■ Features

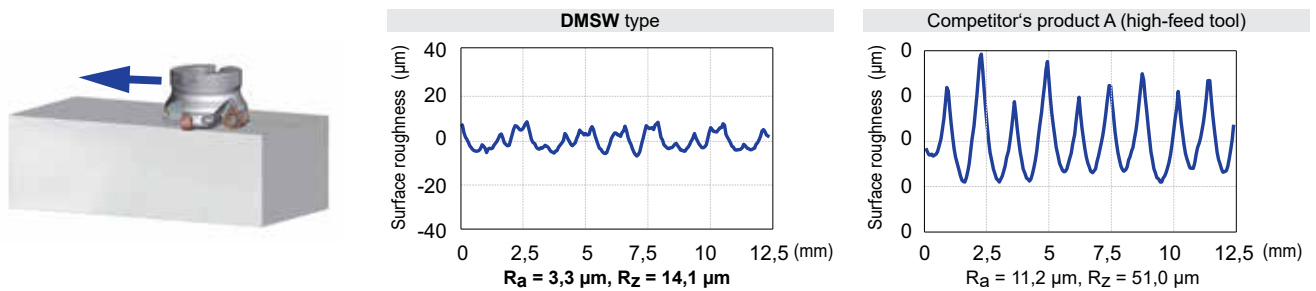
- A small chip cross-section due to a small cutting angle enables high feed rates per tooth.



- Economical double-sided insert with 6-corner specification. Reassuring thick at 7 mm.

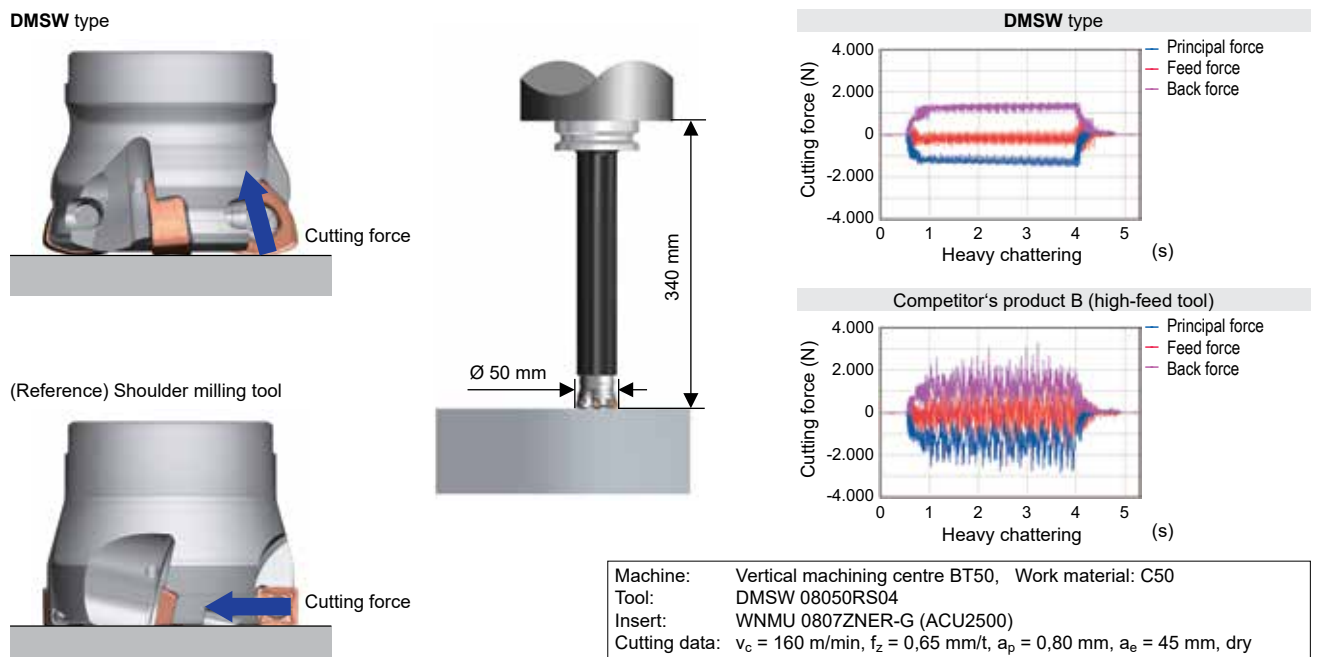


- Even at high feedrates of 2,0 mm/t or more, a reasonable surface finish can be attained.



|          |                                 |                |                                                                                                             |         |                           |
|----------|---------------------------------|----------------|-------------------------------------------------------------------------------------------------------------|---------|---------------------------|
| Machine: | Vertical machining centre BT50, | Work material: | C50                                                                                                         | Insert: | WNMU 0807ZNER-G (ACU2500) |
| Tool:    | DMSW 08063RS04                  | Cutting data:  | $v_c = 150 \text{ m/min}$ , $f_z = 2,5 \text{ mm/t}$ , $a_p = 0,5 \text{ mm}$ , $a_e = 40 \text{ mm}$ , dry |         |                           |

- Small cutting angle ( $15^\circ$ ) controls cutting force toward the back force direction. Suppresses chatter in long tool overhang machining, increasing efficiency.



# Sumi Dual Mill DMSW Series

## ■ Grade Application Range

In addition to **ACU2500** (capable of being used with various work materials), steel milling grades **ACP2000/ACP3000** and cast iron milling grades **ACK2000/ACK3000** have now been added to the lineup.

| ISOI |                | Finishing to light cutting | Medium cutting | Rough to heavy cutting |
|------|----------------|----------------------------|----------------|------------------------|
| P    | Coated carbide | ACU2500                    |                |                        |
|      |                | ACP2000                    |                | ACP3000                |
|      |                |                            |                |                        |
| M    | Coated carbide | ACU2500                    |                |                        |
| K    | Coated carbide | ACU2500                    |                |                        |
|      |                | ACK2000                    |                | ACK3000                |
|      |                |                            |                |                        |

The letters „C“ and „P“ at the end of each grade indicate the coating type.

▽ : CVD ▲ : PVD

## ■ Grade Features

New coating technology that realises absolute stability  
**ABSOTECH™** (absolute technology)

**ABSOTECH**

CVD

**Special Surface Treatment**  
Suppresses thermal cracking by introducing high compressive stress, resulting in chipping resistance more than twice as good as conventional types.

**Crystal Orientation Control Al<sub>2</sub>O<sub>3</sub>**  
By controlling the growth direction, Al<sub>2</sub>O<sub>3</sub> is reinforced for crater wear resistance more than twice as good as conventional types.

**High Hardness TiCN**  
Increased TiCN hardness by using a C-rich composition for flank wear resistance more than twice as good as conventional types.

Applicable grades: ACP2000, ACK2000

**ABSOTECH**

PVD

**New Super Multi-Layered Structure**  
Higher hardness and twice the conventional wear resistance due to a fine crystal structure.  
AlTiCrBN-based nano-layered coating

**High Adhesion Strength**  
Coating adhesion significantly increased for twice or more the conventional chipping resistance.

Applicable grades: ACU2500, ACP3000, ACK3000

## ■ Grade Characteristic Values

### ⚙ CVD

| Work material | Grade   | Hardness (HRA) | TRS (GPa) | Coating type | Coating thickness (μm) | Features                                                                                                                                                                                      | Old grade        |
|---------------|---------|----------------|-----------|--------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| P             | ACP2000 | 89,5           | 3,2       | ABSOTECH     | 10                     | For high-speed machining of steel. Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal crack resistance. | ACP100           |
| K             | ACK2000 | 91,7           | 3,1       | ABSOTECH     | 10                     | For high-speed cast iron milling. Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal resistance.        | ACK100<br>ACK200 |

### ⚙ PVD

| Work material | Grade   | Hardness (HRA) | TRS (GPa) | Coating type | Coating thickness (μm) | Features                                                                                                                                                                                                                                                             | Old grade        |
|---------------|---------|----------------|-----------|--------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| P             |         |                |           |              |                        | General purpose grade supporting steel, stainless steel and cast iron machining.                                                                                                                                                                                     |                  |
|               | ACU2500 | 91,6           | 3,8       | ABSOTECH     | 3                      | Adopts a carbide substrate with excellent fracture resistance and wear resistance, plus a new coating with excellent wear resistance and chipping resistance, realising stable long tool life on various work materials.                                             | —                |
|               | ACP3000 | 89,5           | 3,2       | ABSOTECH     | 3                      | Our 1st recommended grade for milling steel. Carbide substrate with excellent thermal crack resistance plus a new coating with excellent wear resistance and chipping resistance, realises stable long tool life over a wide range of cutting conditions.            | ACP200<br>ACP300 |
| K             | ACK3000 | 91,7           | 3,1       | ABSOTECH     | 3                      | Our 1st recommended grade for milling cast iron. Adopts a high thermal conductivity carbide substrate and a new coating with excellent wear resistance and chipping resistance, realising stable long tool life over a wide range of cast iron machining operations. | ACK300           |

## ■ Precautions for Corner Finishing

Actual machined corners will have uncut and overcut portions due to the shape of the inserts.

Fig. 1

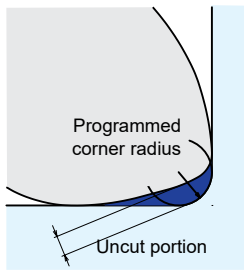
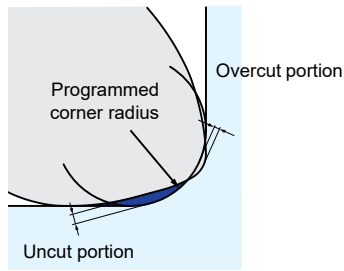


Fig. 2

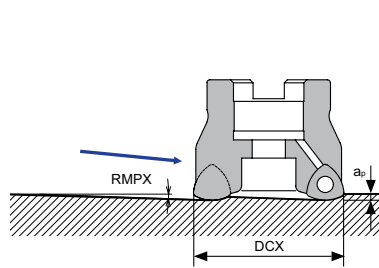


| Programmed corner radius | Uncut portion | Overcut portion | Fig. |
|--------------------------|---------------|-----------------|------|
| 2,0                      | 1,22          | 0               | 1    |
| 2,5                      | 1,08          | 0               | 1    |
| 3,0                      | 0,95          | 0               | 1    |
| 3,5                      | 0,83          | 0,04            | 2    |

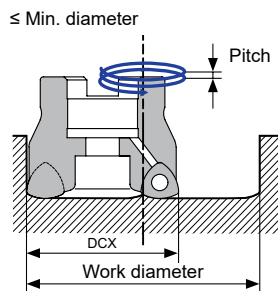
(mm)

## ■ Ramping/Helical Milling Upper Limit

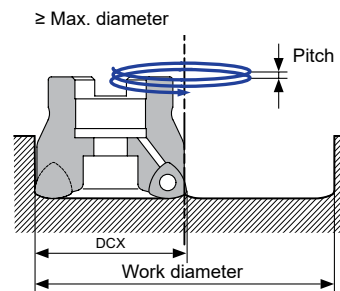
Ramping



Helical Milling



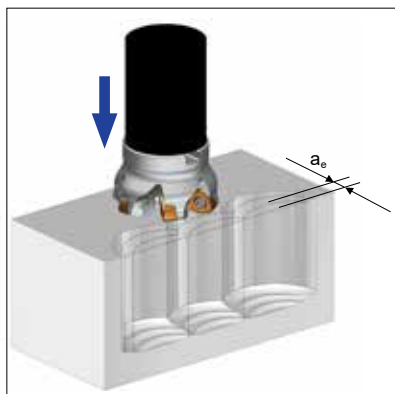
Below the min. machining diameter:  
Centre uncut portion cannot be removed by traverse cutting with the same cutter.



Above the max. machining diameter:  
Centre uncut portion can be removed by traverse cutting with the same cutter.

| Max. dia.<br>DCX<br>(mm) | Ramping                        | Helical milling             |                        |                           |                        |                             |                        |
|--------------------------|--------------------------------|-----------------------------|------------------------|---------------------------|------------------------|-----------------------------|------------------------|
|                          | Max. ramping angle<br>RMPX (°) | Max. machining dia.<br>(mm) | Max. pitch<br>(mm/rev) | Standard diameter<br>(mm) | Max. pitch<br>(mm/rev) | Min. machining dia.<br>(mm) | Max. pitch<br>(mm/rev) |
| 35                       | 0,5                            | 069,3                       | 1,3                    | 53,5                      | 0,5                    | 052,0                       | 0,5                    |
| 40                       | 0,8                            | 079,3                       | 2,0                    | 63,4                      | 1,0                    | 060,2                       | 0,5                    |
| 42                       | 0,8                            | 083,3                       | 2,0                    | 67,4                      | 1,0                    | 063,9                       | 0,5                    |
| 50                       | 1,4                            | 099,3                       | 2,0                    | 83,3                      | 2,0                    | 079,1                       | 1,0                    |
| 52                       | 1,4                            | 103,3                       | 2,0                    | 87,3                      | 2,0                    | 082,8                       | 1,0                    |
| 63                       | 1,2                            | 125,3                       | 2,0                    | 109,3                     | 2,0                    | 103,6                       | 1,0                    |
| 66                       | 1,2                            | 131,3                       | 2,0                    | 115,3                     | 2,0                    | 109,4                       | 1,0                    |
| 80                       | 1,2                            | 159,3                       | 2,0                    | 143,2                     | 2,0                    | 134,0                       | 1,0                    |
| 85                       | 1,2                            | 169,3                       | 2,0                    | 153,2                     | 2,0                    | 144,0                       | 1,0                    |
| 100                      | 0,8                            | 199,3                       | 2,0                    | 183,2                     | 2,0                    | 174,0                       | 1,0                    |
| 125                      | Not recommended                |                             |                        |                           |                        |                             |                        |
| 160                      | Not recommended                |                             |                        |                           |                        |                             |                        |

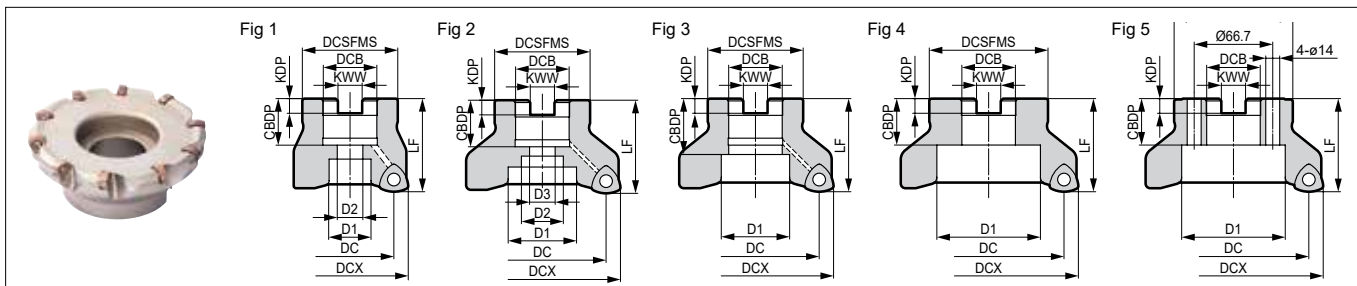
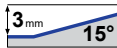
## ■ Plunge Cutting Upper Limit



| Max. ae (mm) | Max. fz (mm/t) |
|--------------|----------------|
| 10           | 0,2            |

## DMSW 08000 R(S) Type

|            |        |             |
|------------|--------|-------------|
| Rake angle | Radial | -7° to -10° |
|            | Axial  | -6°         |



## ■ Body (Shell Type)

| Body (Shell type) |           |              |     |       |        |     |     |        |      |      |      |      |    | Dimensions (mm) |             |      |   |
|-------------------|-----------|--------------|-----|-------|--------|-----|-----|--------|------|------|------|------|----|-----------------|-------------|------|---|
| Cat. No.          |           | Stock        | DCX | DC    | DCSFMS | LF  | DCB | KWW    | KDP  | CBDP | D1   | D2   | D3 | Number of teeth | Weight (kg) | Fig. |   |
| Metric            | DMSW      | 08050RS04    | ●   | 50    | 33,4   | 41  | 40  | 22     | 10,4 | 6,3  | 20   | 16,7 | 11 | —               | 4           | 0,25 | 1 |
|                   |           | 08050RS05    | ●   | 50    | 33,4   | 41  | 40  | 22     | 10,4 | 6,3  | 20   | 16,7 | 11 | —               | 5           | 0,24 | 1 |
|                   |           | 08052RS04    |     | 52    | 35,4   | 41  | 40  | 22     | 10,4 | 6,3  | 20   | 17   | 11 | —               | 4           | 0,27 | 1 |
|                   |           | 08052RS05    |     | 52    | 35,4   | 41  | 40  | 22     | 10,4 | 6,3  | 20   | 17   | 11 | —               | 5           | 0,25 | 1 |
|                   |           | 08063RS04    | ●   | 63    | 46,4   | 50  | 40  | 22     | 10,4 | 6,3  | 20   | 18   | 11 | —               | 4           | 0,46 | 1 |
|                   |           | 08063RS05    | ●   | 63    | 46,4   | 50  | 40  | 22     | 10,4 | 6,3  | 20   | 18   | 11 | —               | 5           | 0,46 | 1 |
|                   |           | 08063RS06    | ●   | 63    | 46,4   | 50  | 40  | 22     | 10,4 | 6,3  | 20   | 18   | 11 | —               | 6           | 0,44 | 1 |
|                   |           | 08063RS05-27 | ●   | 63    | 46,4   | 50  | 50  | 27     | 12,4 | 7    | 22   | 20   | 14 | —               | 5           | 0,55 | 1 |
|                   |           | 08063RS06-27 | ●   | 63    | 46,4   | 50  | 50  | 27     | 12,4 | 7    | 22   | 20   | 14 | —               | 6           | 0,53 | 1 |
|                   |           | 08066RS05-27 |     | 66    | 49,4   | 50  | 50  | 27     | 12,4 | 7    | 22   | 20   | 14 | —               | 5           | 0,60 | 1 |
|                   |           | 08066RS06-27 |     | 66    | 49,4   | 50  | 50  | 27     | 12,4 | 7    | 22   | 20   | 14 | —               | 6           | 0,58 | 1 |
|                   |           | 08080RS06    | ●   | *80   | 63,3   | 55  | 50  | 27     | 12,4 | 7    | 22   | 20   | 14 | —               | 6           | 0,88 | 1 |
|                   |           | 08080RS08    | ●   | *80   | 63,3   | 55  | 50  | 27     | 12,4 | 7    | 22   | 20   | 14 | —               | 8           | 0,84 | 1 |
|                   |           | 08100RS06    | ●   | 100   | 83,3   | 70  | 50  | 32     | 14,4 | 8    | 32   | 46   | —  | —               | 6           | 1,29 | 3 |
|                   | 08125RS08 | ●            | 125 | 108,3 | 80     | 63  | 40  | 16,4   | 9    | 29   | 52   | 29   | —  | 8               | 2,41        | 1    |   |
|                   | 08160RS10 | ●            | 160 | 143,3 | 130    | 63  | 40  | 16,4   | 9    | 29   | 90   | —    | —  | 10              | 4,73        | 5    |   |
| Inch              | DMSW      | 08050R04     | ○   | 50    | 33,4   | 41  | 40  | 22,225 | 8,4  | 5    | 20   | 16,7 | 11 | —               | 4           | 0,25 | 1 |
|                   |           | 08050R05     | ○   | 50    | 33,4   | 41  | 40  | 22,225 | 8,4  | 5    | 20   | 16,7 | 11 | —               | 5           | 0,24 | 1 |
|                   |           | 08063R04     | ○   | 63    | 46,4   | 50  | 40  | 22,225 | 8,4  | 5    | 20   | 18   | 11 | —               | 4           | 0,46 | 1 |
|                   |           | 08063R05     | ○   | 63    | 46,4   | 50  | 40  | 22,225 | 8,4  | 5    | 20   | 18   | 11 | —               | 5           | 0,46 | 1 |
|                   |           | 08063R06     | ○   | 63    | 46,4   | 50  | 40  | 22,225 | 8,4  | 5    | 20   | 18   | 11 | —               | 6           | 0,44 | 1 |
|                   |           | 08080R06     | ○   | *80   | 63,3   | 70  | 63  | 31,75  | 12,7 | 8    | 32   | 27   | 18 | —               | 6           | 1,32 | 1 |
|                   |           | 08080R08     | ○   | *80   | 63,3   | 70  | 63  | 31,75  | 12,7 | 8    | 32   | 27   | 18 | —               | 8           | 1,28 | 1 |
|                   |           | 08100R06     | ○   | *100  | 83,3   | 70  | 63  | 31,75  | 12,7 | 8    | 32   | 46   | 27 | 18              | 6           | 1,75 | 2 |
|                   |           | 08125R08     | ○   | 125   | 108,3  | 80  | 63  | 38,1   | 15,9 | 10   | 35,5 | 55   | 30 | —               | 8           | 2,55 | 1 |
|                   |           | 08160R10     | ○   | 160   | 143,3  | 100 | 63  | 50,8   | 19,1 | 11   | 38   | 72   | —  | —               | 10          | 4,18 | 4 |

Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold separately.

For mounting the Ø 80 mm, Ø 85 mm and Ø 100 mm sized cutters marked with \* to an arbor, use a JIS B1176 hexagonal socket bolt (metric specification : M12x30 to 35 mm, inch specification: M16x40 to 45 mm).

## ■ Parts

| Applicable cutters | Insert screw |     | Wrench   | Handle grip | Wrench bit |
|--------------------|--------------|-----|----------|-------------|------------|
|                    |              |     |          |             |            |
| DMSW 08160R(S)10   | BFTX0513IP   | 5,0 | TRDR20IP | —           | —          |
| Other than above   |              |     | —        | HPL2025     | TPB20IP    |

## ■ Identification Details

|               |             |                 |                |          |                 |               |
|---------------|-------------|-----------------|----------------|----------|-----------------|---------------|
| <b>DMSW</b>   | <b>08</b>   | <b>063</b>      | <b>R</b>       | <b>S</b> | <b>05 - 27</b>  |               |
| Cutter series | Insert size | Cutter diameter | Feed direction | Metric   | Number of teeth | Mounting size |

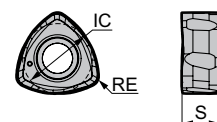
## ■ Recommended Cutting Conditions

→ P. 7

## ■ Inserts

| Application            |  | Coated carbide |         |         |         |         | Dimensions (mm) |   |     |      |
|------------------------|--|----------------|---------|---------|---------|---------|-----------------|---|-----|------|
| High speed / Light cut |  |                | P       |         | K       |         |                 |   |     |      |
| General purpose        |  |                | P       | P       | K       | K       |                 |   |     |      |
| Roughing               |  |                |         | P       |         | K       |                 |   |     |      |
| Cat. No.               |  | ACU2500        | ACP2000 | ACP3000 | ACK2000 | ACK3000 | IC              | S | RE  | Fig. |
| WNMU 0807ZNER-G        |  | ●              | ●       | ●       | ●       | ●       | 13              | 7 | 1,6 | 1    |
| WNMU 0807ZNER-H        |  | ●              | ●       | ●       | ●       | ●       | 13              | 7 | 1,6 | 1    |

Fig 1

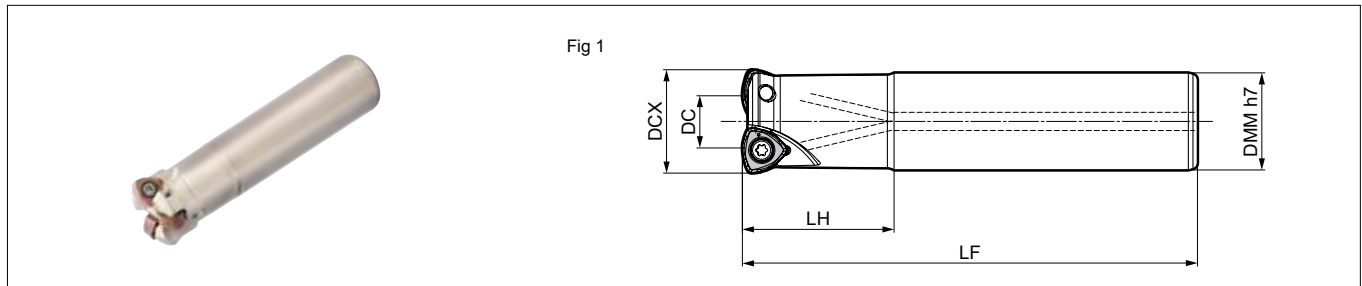


● = Euro stock

○ = Japan stock

# Sumi Dual Mill DMSW 08000 E(L) Type

|            |        |             |      |     |
|------------|--------|-------------|------|-----|
| Rake angle | Radial | -7° to -10° | 3 mm | 15° |
|            | Axial  | -6°         |      |     |



## Body (Shank Type)

Dimensions (mm)

| Cat. No.      | Stock | DCX | DC   | DMM | LH | LF  | Number of teeth | Weight (kg) | Fig. |
|---------------|-------|-----|------|-----|----|-----|-----------------|-------------|------|
| DMSW 08035E02 | ●     | 35  | 18,6 | 32  | 50 | 150 | 2               | 0,85        | 1    |
| 08040E03      | ●     | 40  | 23,5 | 32  | 50 | 150 | 3               | 0,86        | 1    |
| 08050E03-42   | ●     | 50  | 33,4 | 42  | 50 | 150 | 3               | 1,51        | 1    |

Inserts are sold separately.

## Body (Long Shank Type)

Dimensions (mm)

| Cat. No.       | Stock | DCX | DC   | DMM | LH | LF  | Number of teeth | Weight (kg) | Fig. |
|----------------|-------|-----|------|-----|----|-----|-----------------|-------------|------|
| DMSW 08035EL02 | ●     | 35  | 18,6 | 32  | 60 | 210 | 2               | 1,21        | 1    |
| 08040EL03      | ●     | 40  | 23,5 | 32  | 60 | 210 | 3               | 1,22        | 1    |
| 08050EL03-42   | ●     | 50  | 33,4 | 42  | 50 | 250 | 3               | 2,54        | 1    |

Inserts are sold separately.

## Parts

| Insert screw                                                                        | Wrench                                                                              |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |
| BFTX0513IP                                                                          | TRDR20IP                                                                            |

## Identification Details

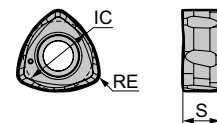
|               |             |                 |          |                 |                 |          |                |
|---------------|-------------|-----------------|----------|-----------------|-----------------|----------|----------------|
| <b>DMSW</b>   | <b>08</b>   | <b>050</b>      | <b>E</b> | <b>L</b>        | <b>03</b>       | <b>-</b> | <b>42</b>      |
| Cutter series | Insert size | Cutter diameter | Shank    | Long shank type | Number of teeth |          | Shank diameter |

## Inserts

Dimensions (mm)

| Application            | Coated carbide |         |         |         |         |    |   |     |      |
|------------------------|----------------|---------|---------|---------|---------|----|---|-----|------|
| High speed / light cut |                | P       |         | K       |         |    |   |     |      |
| General purpose        | P              | P       | K       | K       |         |    |   |     |      |
| Roughing               | P              | P       | K       | K       |         |    |   |     |      |
| Cat. No.               | ACU2500        | ACP2000 | ACP3000 | ACK2000 | ACK3000 | IC | S | RE  | Fig. |
| WNMU 0807ZNER-G        | ●              | ●       | ●       | ●       | ●       | 13 | 7 | 1,6 | 1    |
| WNMU 0807ZNER-H        | ●              | ●       | ●       | ●       | ●       | 13 | 7 | 1,6 | 1    |

Fig 1



## Recommended Cutting Conditions

min.—optimum—max.

| ISO | Work material   | Hardness | Cutting speed $v_c$ (m/min) | Feed rate $f_z$ (mm/t) |
|-----|-----------------|----------|-----------------------------|------------------------|
| P   | General steel   | < 280 HB | 100–160–250                 | 1,0–1,5–2,0            |
|     | Alloy steel     | < 280 HB | 100–160–200                 | 1,0–1,5–1,8            |
|     | Alloy steel     | < 42 HRC | 100–150–180                 | 0,8–1,0–1,2            |
| M   | Stainless steel | —        | 80–120–150                  | 0,8–1,0–1,2            |
| K   | Cast iron       | —        | 100–160–250                 | 1,0–1,5–1,8            |
| H   | Hardened steel  | < 52 HRC | 80–100–120                  | 0,3–0,5–0,7            |

The above figures are guidelines for use with BT50 machine tools at depth of cut ( $a_p$ ) of 1,5 mm.

The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.

● = Euro stock

|            |        |              |
|------------|--------|--------------|
| Rake angle | Radial | -11° to -13° |
|            | Axial  | -6°          |

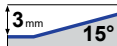
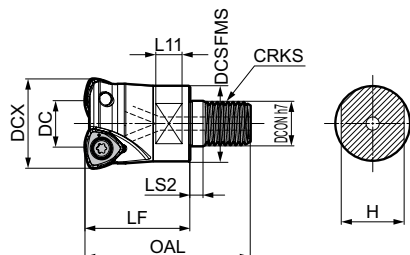


Fig 1

**Head**

Dimensions (mm)

| Cat. No.        | Stock | DCX | DC   | DCSFMS | DCON | CRKS | OAL | LF | LS2 | L11 | H  | Number of teeth | Weight (kg) | Fig. |
|-----------------|-------|-----|------|--------|------|------|-----|----|-----|-----|----|-----------------|-------------|------|
| DMSW 08035M16Z2 | ●     | 35  | 18,6 | 28,5   | 17   | M16  | 63  | 40 | 5   | 10  | 24 | 2               | 0,19        | 1    |
| 08040M16Z3      | ●     | 40  | 23,5 | 28,5   | 17   | M16  | 63  | 40 | 5   | 10  | 24 | 3               | 0,21        | 1    |

Inserts are sold separately.

**Parts**

| Insert screw | Wrench       |
|--------------|--------------|
|              |              |
| BFTX0513IP   | 5,0 TRDR20IP |

**Identification Details****DMSW 08 040 M16 Z3**

Cutter series

Insert size

Cutter diameter

Mounting screw size

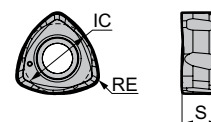
Number of teeth

**Inserts**

Dimensions (mm)

| Application            | Coated carbide |         |         |         |         |    |   |     |      |
|------------------------|----------------|---------|---------|---------|---------|----|---|-----|------|
| High speed / light cut |                | P       |         | K       |         |    |   |     |      |
| General purpose        |                | P       | P       | K       | K       |    |   |     |      |
| Roughing               |                |         | P       |         | K       |    |   |     |      |
| Cat. No.               | ACU2500        | ACP2000 | ACP3000 | ACK2000 | ACK3000 | IC | S | RE  | Fig. |
| WNMU 0807ZNER-G        | ●              | ●       | ●       | ●       | ●       | 13 | 7 | 1,6 | 1    |
| WNMU 0807ZNER-H        | ●              | ●       | ●       |         |         | 13 | 7 | 1,6 | 1    |

Fig 1

**Recommended Cutting Conditions**

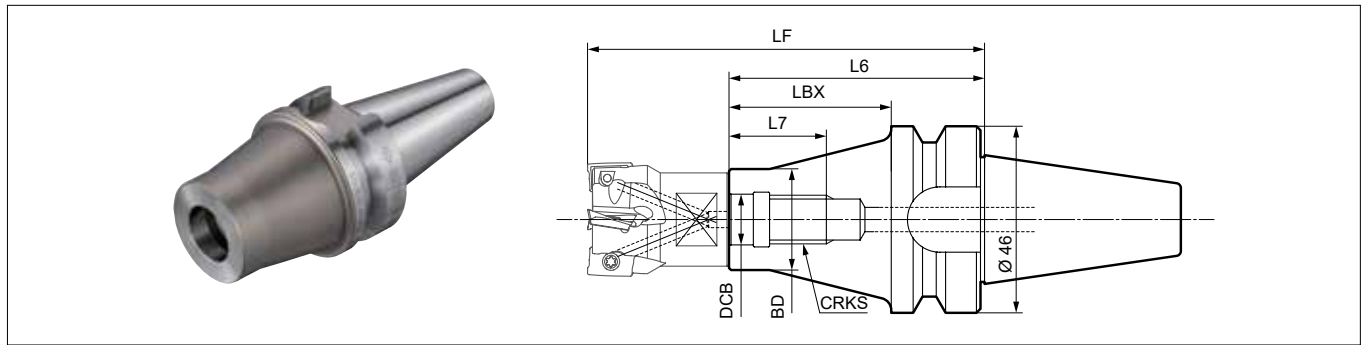
min.—optimum—max.

| ISO      | Work material   | Hardness | Cutting speed<br>$v_c$ (m/min) | Feed rate<br>$f_z$ (mm/t) |
|----------|-----------------|----------|--------------------------------|---------------------------|
| <b>P</b> | General steel   | < 280 HB | 100–160–250                    | 1,0–1,5–2,0               |
|          | Alloy steel     | < 280 HB | 100–160–200                    | 1,0–1,5–1,8               |
|          | Alloy steel     | < 42 HRC | 100–150–180                    | 0,8–1,0–1,2               |
| <b>M</b> | Stainless steel | —        | 80–120–150                     | 0,8–1,0–1,2               |
| <b>K</b> | Cast iron       | —        | 100–160–250                    | 1,0–1,5–1,8               |
| <b>H</b> | Hardened steel  | < 52 HRC | 80–100–120                     | 0,3–0,5–0,7               |

The above figures are guidelines for use with BT50 machine tools at depth of cut ( $a_e$ ) of 1,5 mm.

The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.

## ■ BBT Integrated Type - Modular Tools Special Arbors



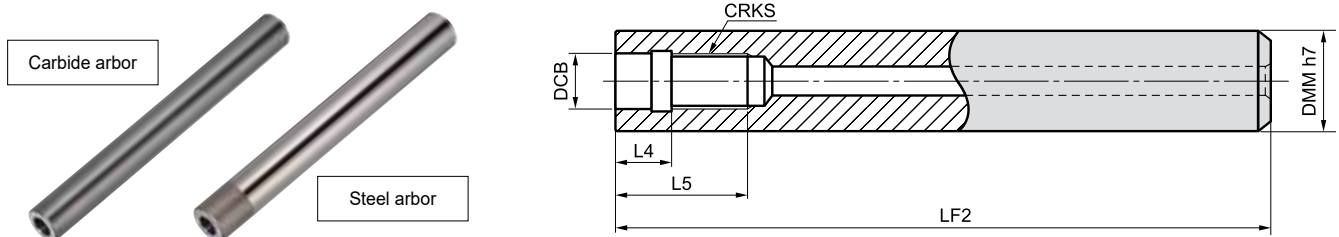
## ■ BBT Integrated Arbor

Dimensions (mm)

| Cat. No.      | Stock | CRKS | DCB | BD   | L6 | LBX | L7 | LF* | Coolant hole |
|---------------|-------|------|-----|------|----|-----|----|-----|--------------|
| BBT30- M16-35 | ○     | M16  | 17  | 31,9 | 58 | 35  | 24 | 98  | yes          |

\* Overhang length for LF is with head mounted. Can also be used with BT30 special machines.

## ■ Carbide and Steel Arbor



## ■ Carbide Arbor

Dimensions (mm)

| Cat. No.        | Stock | CRKS | DCB  | DMM | LF2 | L4 | L5 | LF* |
|-----------------|-------|------|------|-----|-----|----|----|-----|
| MA 28 M16 L200C | ●     | M16  | 17,0 | 28  | 200 | 10 | 24 | 240 |
| 28 M16 L300C    | ●     | M16  | 17,0 | 28  | 300 | 10 | 24 | 340 |
| MA 32 M16 L200C | ●     | M16  | 17,0 | 32  | 200 | 10 | 24 | 240 |
| 32 M16 L300C    | ●     | M16  | 17,0 | 32  | 300 | 10 | 24 | 340 |

## ■ Steel Arbor

Dimensions (mm)

| Cat. No.        | Stock | CRKS | DCB  | DMM | LF2 | L4 | L5 | LF* |
|-----------------|-------|------|------|-----|-----|----|----|-----|
| MA 32 M16 L200S | ●     | M16  | 17,0 | 32  | 200 | 10 | 24 | 240 |

## ■ Identification Details

**MA 15 M08 L120 C**

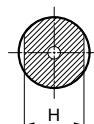
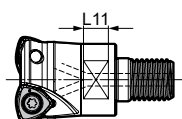
Modular arbor    Shank diameter    Mounting screw    Arbor length    Material  
C: carbide  
S: steel

## ★ Modular Tool System



## ■ Recommended Tightening Torque

Notes about tightening the head:  
When mounting the head to an arbor, follow the attached tightening torque in the table below.  
Check the mounting screw diameter for the head and arbor beforehand.



| Screw size | Tightening torque | Tool dimensions |    |
|------------|-------------------|-----------------|----|
|            | (N·m)             | L11             | H  |
| M16        | 80                | 10              | 24 |

● = Euro stock

○ = Japan stock

# Sumi Dual Mill

## DMSW Series

### Application Examples

| Tool steel X40CrVMo5-1 (45 HRC), mold                                                                                   |                   | Sumitomo                                                                        | Competitor              |
|-------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------|-------------------------|
| Vertical machining centre BT50<br><br> | Tool              | DMSW08050RS05                                                                   | Double sided, 6 corners |
|                                                                                                                         | Grade             | ACU2500                                                                         | —                       |
|                                                                                                                         | Chipbreaker       | G                                                                               | —                       |
|                                                                                                                         | Cutter diam. (mm) | 50                                                                              | 50                      |
|                                                                                                                         | Number of teeth   | 5                                                                               | 4                       |
|                                                                                                                         | $v_c$ (m/min)     | 130                                                                             | 130                     |
|                                                                                                                         | $v_f$ (mm/min)    | 2.500                                                                           | 2.500                   |
|                                                                                                                         | $f_z$ (mm/t)      | 0,75                                                                            | 0,6                     |
|                                                                                                                         | $a_p$ (mm)        | 0,5                                                                             | 0,5                     |
|                                                                                                                         | $a_e$ (mm)        | 35                                                                              | 35                      |
|                                                                                                                         | Coolant           | dry                                                                             | dry                     |
|                                                                                                                         | Results           | Minimal damage to insert even after 50 minutes of machining. Stable chip shape. |                         |

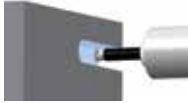
| Prehardened steel (40 HRC), test piece                                                                       |                   | Sumitomo                                                                                                                      | Competitor              |
|--------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Boring machine BT50<br><br> | Tool              | DMSW08100R06                                                                                                                  | Double sided, 6 corners |
|                                                                                                              | Grade             | ACP3000                                                                                                                       | —                       |
|                                                                                                              | Chipbreaker       | G                                                                                                                             | —                       |
|                                                                                                              | Cutter diam. (mm) | 100                                                                                                                           | 100                     |
|                                                                                                              | Number of teeth   | 6                                                                                                                             | 6                       |
|                                                                                                              | $v_c$ (m/min)     | 180                                                                                                                           | 120                     |
|                                                                                                              | $v_f$ (mm/min)    | 5.160                                                                                                                         | 3.440                   |
|                                                                                                              | $f_z$ (mm/t)      | 1,5                                                                                                                           | 1,5                     |
|                                                                                                              | $a_p$ (mm)        | 1                                                                                                                             | 1                       |
|                                                                                                              | $a_e$ (mm)        | 65                                                                                                                            | 65                      |
|                                                                                                              | Coolant           | dry                                                                                                                           | dry                     |
|                                                                                                              | Results           | No chatter even when the cutting speed is increased at an overhang amount of 380 mm (steel arbor). Efficiency increased 1,5x. |                         |

| Tempered steel 42CrMo4 (40 HRC), machine comp.                                                                             |                   | Sumitomo                                                                            | Competitor              |
|----------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------|-------------------------|
| Horizontal machining centre BT50<br><br> | Tool              | DMSW08050RS04                                                                       | Single sided, 3 corners |
|                                                                                                                            | Grade             | ACU2500                                                                             | —                       |
|                                                                                                                            | Chipbreaker       | G                                                                                   | —                       |
|                                                                                                                            | Cutter diam. (mm) | 50                                                                                  | 50                      |
|                                                                                                                            | Number of teeth   | 4                                                                                   | 4                       |
|                                                                                                                            | $v_c$ (m/min)     | 210                                                                                 | 210                     |
|                                                                                                                            | $v_f$ (mm/min)    | 5.825                                                                               | 5.825                   |
|                                                                                                                            | $f_z$ (mm/t)      | 1,1                                                                                 | 1,1                     |
|                                                                                                                            | $a_p$ (mm)        | 1,5                                                                                 | 1,5                     |
|                                                                                                                            | $a_e$ (mm)        | 25                                                                                  | 25                      |
|                                                                                                                            | Coolant           | dry                                                                                 | dry                     |
|                                                                                                                            | Results           | Stable machining without chipping is possible even with heat-treated work material. |                         |

| Alloy steel 25CrMo4, large oil drilling tool                                      |                   | Sumitomo                                                                                     | Competitor |
|-----------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------|------------|
|  | Tool              | DMSW08080R08                                                                                 | —          |
|                                                                                   | Grade             | ACU2500                                                                                      | —          |
|                                                                                   | Chipbreaker       | G                                                                                            | —          |
|                                                                                   | Cutter diam. (mm) | 80                                                                                           | —          |
|                                                                                   | Number of teeth   | 8                                                                                            | —          |
|                                                                                   | $v_c$ (m/min)     | 180                                                                                          | —          |
|                                                                                   | $v_f$ (mm/min)    | 3.400                                                                                        | —          |
|                                                                                   | $f_z$ (mm/t)      | 0,6                                                                                          | —          |
|                                                                                   | $a_p$ (mm)        | 1,9                                                                                          | —          |
|                                                                                   | $a_e$ (mm)        | 57                                                                                           | —          |
|                                                                                   | Coolant           | dry                                                                                          | —          |
|                                                                                   | Results           | Capable of machining single corner of large work piece (nearly 300 minutes). Long tool life. |            |

| Manganese steel construction machine component                                                                              |                   | Sumitomo                                                                                                                                                       | Competitor              |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Horizontal machining centre BT50<br><br> | Tool              | DMSW08080RS06                                                                                                                                                  | Single sided, 2 corners |
|                                                                                                                             | Grade             | ACU2500                                                                                                                                                        | —                       |
|                                                                                                                             | Chipbreaker       | G                                                                                                                                                              | —                       |
|                                                                                                                             | Cutter diam. (mm) | 80                                                                                                                                                             | 80                      |
|                                                                                                                             | Number of teeth   | 6                                                                                                                                                              | 5                       |
|                                                                                                                             | $v_c$ (m/min)     | 80                                                                                                                                                             | 80                      |
|                                                                                                                             | $v_f$ (mm/min)    | 900                                                                                                                                                            | 900                     |
|                                                                                                                             | $f_z$ (mm/t)      | 0,47                                                                                                                                                           | 0,56                    |
|                                                                                                                             | $a_p$ (mm)        | 1                                                                                                                                                              | 1                       |
|                                                                                                                             | $a_e$ (mm)        | 60                                                                                                                                                             | 60                      |
|                                                                                                                             | Coolant           | wet                                                                                                                                                            | wet                     |
|                                                                                                                             | Results           | Machining without chatter even for castings with low clamp rigidity. Stability with no sudden fractures even in mill-scale work, for a longer tool life (1,3x) |                         |

| Alloy steel 15CrMo5, machine component                                                                                      |                   | Sumitomo                                                                                  | Competitor               |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------|--------------------------|
| Horizontal machining centre BT40<br><br> | Tool              | DMSW08125RS08                                                                             | Double sided, 10 corners |
|                                                                                                                             | Grade             | ACU2500                                                                                   | —                        |
|                                                                                                                             | Chipbreaker       | G                                                                                         | —                        |
|                                                                                                                             | Cutter diam. (mm) | 125                                                                                       | 125                      |
|                                                                                                                             | Number of teeth   | 8                                                                                         | 13                       |
|                                                                                                                             | $v_c$ (m/min)     | 280                                                                                       | 200                      |
|                                                                                                                             | $v_f$ (mm/min)    | 4.280                                                                                     | 2.185                    |
|                                                                                                                             | $f_z$ (mm/t)      | 0,75                                                                                      | 0,33                     |
|                                                                                                                             | $a_p$ (mm)        | 1,5                                                                                       | 2,0                      |
|                                                                                                                             | $a_e$ (mm)        | 100                                                                                       | 100                      |
|                                                                                                                             | Coolant           | wet                                                                                       | wet                      |
|                                                                                                                             | Results           | Efficiency improved 1,5x. No sudden fracture. Improved tool life and increased stability. |                          |

| Carbon steel C45, large mold part                                                                              |                   | Sumitomo                                                                                                                                            | Competitor              |
|----------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Boring machine BT50<br><br> | Tool              | DMSW08050RS05                                                                                                                                       | Single sided, 4 corners |
|                                                                                                                | Grade             | ACU2500                                                                                                                                             | —                       |
|                                                                                                                | Chipbreaker       | G                                                                                                                                                   | —                       |
|                                                                                                                | Cutter diam. (mm) | 50                                                                                                                                                  | 50                      |
|                                                                                                                | Number of teeth   | 5                                                                                                                                                   | 5                       |
|                                                                                                                | $v_c$ (m/min)     | 189                                                                                                                                                 | 189                     |
|                                                                                                                | $v_f$ (mm/min)    | 5.000                                                                                                                                               | 5.000                   |
|                                                                                                                | $f_z$ (mm/t)      | 0,83                                                                                                                                                | 0,83                    |
|                                                                                                                | $a_p$ (mm)        | 1                                                                                                                                                   | 1                       |
|                                                                                                                | $a_e$ (mm)        | 50                                                                                                                                                  | 50                      |
|                                                                                                                | Coolant           | wet                                                                                                                                                 | wet                     |
|                                                                                                                | Results           | Effective without chatter even when using a 200 mm long steel arbor. Achieves roughing (240 min.) of large workpieces without indexing the inserts. |                         |

| Low carbon steel SS400, machine component                                                                                 |                   | Sumitomo       | Competitor              |
|---------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|-------------------------|
| Vertical machining centre BT40<br><br> | Tool              | DMSW08040E03   | Double sided, 4 corners |
|                                                                                                                           | Grade             | ACU2500        | —                       |
|                                                                                                                           | Chipbreaker       | G              | —                       |
|                                                                                                                           | Cutter diam. (mm) | 40             | 32                      |
|                                                                                                                           | Number of teeth   | 3              | 6                       |
|                                                                                                                           | $v_c$ (m/min)     | 150            | 120                     |
|                                                                                                                           | $v_f$ (mm/min)    | 3.800          | 3.800                   |
|                                                                                                                           | $f_z$ (mm/t)      | 1,0            | 0,5                     |
|                                                                                                                           | $a_p$ (mm)        | 0,5            | 0,5                     |
|                                                                                                                           | $a_e$ (mm)        | 30             | 30                      |
|                                                                                                                           | Coolant           | wet            | wet                     |
|                                                                                                                           | Results           | 2 x tool life. |                         |

## Application Examples

| Stainless steel X5CrNiS18 10, machine component |                   | Sumitomo                                                      | Competitor              |
|-------------------------------------------------|-------------------|---------------------------------------------------------------|-------------------------|
| Vertical 5-axis machining centre BT50           | Tool              | DMSW08080R08                                                  | Single sided, 2 corners |
|                                                 | Grade             | ACU2500                                                       | —                       |
|                                                 | Chipbreaker       | G                                                             | —                       |
|                                                 | Cutter diam. (mm) | 80                                                            | 80                      |
|                                                 | Number of teeth   | 8                                                             | 7                       |
|                                                 | $v_c$ (m/min)     | 120                                                           | 126                     |
|                                                 | $v_f$ (mm/min)    | 2.675                                                         | 490                     |
|                                                 | $f_z$ (mm/t)      | 0,7                                                           | 0,1                     |
|                                                 | $a_p$ (mm)        | 1                                                             | 2                       |
|                                                 | $a_e$ (mm)        | 40                                                            | 40                      |
|                                                 | Coolant           | dry                                                           | dry                     |
|                                                 | Results           | Efficiency increased 2,7x.<br>Tool life increased 6x or more. |                         |



| Gray cast iron GG-25, mold     |                   | Sumitomo                                                                   | Competitor              |
|--------------------------------|-------------------|----------------------------------------------------------------------------|-------------------------|
| Vertical machining centre BT50 | Tool              | DMSW08100R06                                                               | Single sided, 4 corners |
|                                | Grade             | ACP3000                                                                    | —                       |
|                                | Chipbreaker       | G                                                                          | —                       |
|                                | Cutter diam. (mm) | 100                                                                        | 100                     |
|                                | Number of teeth   | 6                                                                          | 6                       |
|                                | $v_c$ (m/min)     | 100                                                                        | 100                     |
|                                | $v_f$ (mm/min)    | 1.910                                                                      | 1.910                   |
|                                | $f_z$ (mm/t)      | 1                                                                          | 1                       |
|                                | $a_p$ (mm)        | 1,5                                                                        | 1,5                     |
|                                | $a_e$ (mm)        | 50                                                                         | 50                      |
|                                | Coolant           | wet                                                                        | wet                     |
|                                | Results           | Sudden fracture during mill-scale work eliminated.<br>Tool life increased. |                         |



| Gray cast iron GG-25, machine component |                   | Sumitomo                                                                                                   | Competitor              |
|-----------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------|-------------------------|
| Vertical machining centre BT50          | Tool              | DMSW08063R05                                                                                               | Single sided, 3 corners |
|                                         | Grade             | ACU2500                                                                                                    | —                       |
|                                         | Chipbreaker       | G                                                                                                          | —                       |
|                                         | Cutter diam. (mm) | 63                                                                                                         | 63                      |
|                                         | Number of teeth   | 5                                                                                                          | 4                       |
|                                         | $v_c$ (m/min)     | 158                                                                                                        | 158                     |
|                                         | $v_f$ (mm/min)    | 4.000                                                                                                      | 1.500                   |
|                                         | $f_z$ (mm/t)      | 1,0                                                                                                        | 0,47                    |
|                                         | $a_p$ (mm)        | 2                                                                                                          | 1                       |
|                                         | $a_e$ (mm)        | 50                                                                                                         | 50                      |
|                                         | Coolant           | dry                                                                                                        | dry                     |
|                                         | Results           | Capable of increasing the number of teeth, feed rate and depth of cut.<br>Efficiency increased 5x or more. |                         |



| Ductile cast iron FCD540, large mold part |                   | Sumitomo                                                      | Competitor              |
|-------------------------------------------|-------------------|---------------------------------------------------------------|-------------------------|
| Horizontal machining centre BT50          | Tool              | DMSW08050RS04                                                 | Double sided, 4 corners |
|                                           | Grade             | ACU2500                                                       | —                       |
|                                           | Chipbreaker       | G                                                             | —                       |
|                                           | Cutter diam. (mm) | 50                                                            | 50                      |
|                                           | Number of teeth   | 4                                                             | 4                       |
|                                           | $v_c$ (m/min)     | 125                                                           | 125                     |
|                                           | $v_f$ (mm/min)    | 3.000                                                         | 3.000                   |
|                                           | $f_z$ (mm/t)      | 1                                                             | 1                       |
|                                           | $a_p$ (mm)        | 1,5                                                           | 1,5                     |
|                                           | $a_e$ (mm)        | 25                                                            | 25                      |
|                                           | Coolant           | dry                                                           | dry                     |
|                                           | Results           | Minimal damage to insert even after 300 minutes of machining. |                         |



| Ductile cast iron, machine component  |                   | Sumitomo                                                                                                                    | Competitor |
|---------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------|------------|
| Vertical 5-axis machining centre BT40 | Tool              | DMSW08050RS05                                                                                                               | —          |
|                                       | Grade             | ACU2500                                                                                                                     | —          |
|                                       | Chipbreaker       | G                                                                                                                           | —          |
|                                       | Cutter diam. (mm) | 50                                                                                                                          | —          |
|                                       | Number of teeth   | 5                                                                                                                           | —          |
|                                       | $v_c$ (m/min)     | 210                                                                                                                         | —          |
|                                       | $v_f$ (mm/min)    | 5.350                                                                                                                       | —          |
|                                       | $f_z$ (mm/t)      | 0,8                                                                                                                         | —          |
|                                       | $a_p$ (mm)        | 1                                                                                                                           | —          |
|                                       | $a_e$ (mm)        | 30                                                                                                                          | —          |
|                                       | Coolant           | dry                                                                                                                         | —          |
|                                       | Results           | Smooth and stable machining even with low-rigidity equipment.<br>Minimal insert damage even after 220 minutes of machining. |            |



| Tool steel X40CrVMo5-1 (48 HRC), forge mold |                   | Sumitomo                                                                                                                            | Competitor              |
|---------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Vertical machining centre BT40              | Tool              | DMSW08050RS05                                                                                                                       | Single sided, 2 corners |
|                                             | Grade             | ACU2500                                                                                                                             | —                       |
|                                             | Chipbreaker       | G                                                                                                                                   | —                       |
|                                             | Cutter diam. (mm) | 50                                                                                                                                  | 30                      |
|                                             | Number of teeth   | 5                                                                                                                                   | 7                       |
|                                             | $v_c$ (m/min)     | 120                                                                                                                                 | 70                      |
|                                             | $v_f$ (mm/min)    | 7.000                                                                                                                               | 3.110                   |
|                                             | $f_z$ (mm/t)      | 1,83                                                                                                                                | 0,6                     |
|                                             | $a_p$ (mm)        | 0,5                                                                                                                                 | 0,15                    |
|                                             | $a_e$ (mm)        | 36                                                                                                                                  | 22                      |
|                                             | Coolant           | wet                                                                                                                                 | wet                     |
|                                             | Results           | Larger diameter for increased tool rigidity. Capable of machining at a large single tooth feed rate. Machining time reduced to 1/6. |                         |





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