

Expand

High Efficiency Machining for Aluminium Alloys

ALIMASTER



An undercut type now available.

High efficiency machining for aluminium alloys

- High speed milling over 6000cc/min
(Roughing type)
- Complete line-up from roughing to finishing.
- Undercut type used to reduce steps on deep wall faces.

High Efficiency Machining for Aluminium Alloys

ALIMASTER

C-3SARB

Corner radius end mill,
Short cut length, 3 flute

C-2MHA

2 flute, Medium cut length,
High helix

C-2SA

2 flute, Short cut length,
Relieved neck

C-3SA Expand

3 flute, Short cut length,
Relieved neck

C-SRA

Roughing end mill,
Short cut length, 3 flute

C-MRA

Roughing end mill,
Medium cut length, 3 flute

C-SRARB

Corner radius roughing end mill,
Short cut length, 3 flute

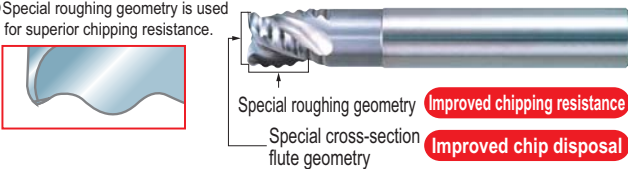
Possible to achieve high efficiency machining of aluminium alloys, chip removal volumes over 6000cc/min.

Features

- Special flute geometry for improved chip disposal!
- Improved vibration resistance due to the use of a special cutting edge geometry.
- Complete line-up from roughing to finishing.

Roughing Type

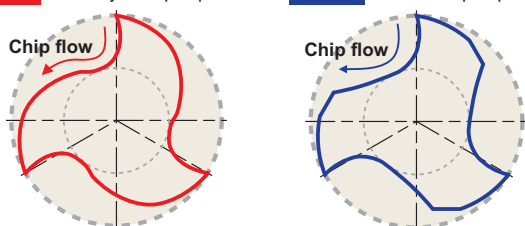
● Special roughing geometry is used for superior chipping resistance.



Special roughing geometry Improved chipping resistance
Special cross-section flute geometry Improved chip disposal

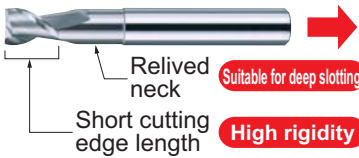
● Cross sectional geometry comparison

Competitor Instability in chip separation Mitsubishi Smooth chip separation



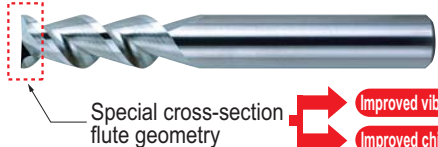
Square / Radius Type

Short cutting edge length
(2 flute, 3 flute, 3 flute corner radius)



Relieved neck Suitable for deep slotting
Short cutting edge length High rigidity

Medium cutting edge length
(2 flute)

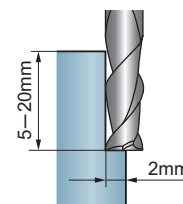
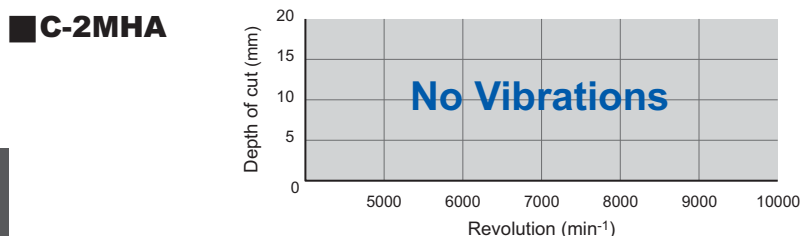
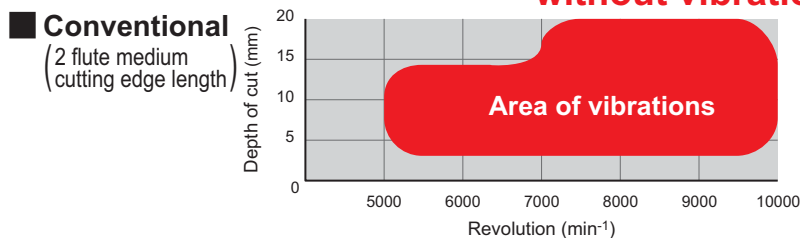


Special cross-section flute geometry Improved vibration resistance
Improved chipping resistance

Achieves high efficiency deep machining

Machining Example 1

Vibration Resistance Comparison Can be used under a wide range of conditions without vibrations occurring.



| | |
|------------------|-------------------------------|
| End mill | C2MHAD1000 (φ10) |
| Workpiece | Aluminium (JIS A7075) |
| Revolution | 5000—10000min ⁻¹ |
| Feed rate | 500—1000mm/min (0.05mm/tooth) |
| Machining method | Down cut, Emulsion |

CARBIDE END MILLS

C-2MHA

2 flute, Medium cut length, High helix

C-2SA

2 flute, Short cut length, Relieved neck

C-3SA Expand

3 flute, Short cut length, Relieved neck

C-3SARB

Corner radius end mill, Short cut length, 3 flute

C-SRA

Roughing end mill, Short cut length, 3 flute

C-MRA

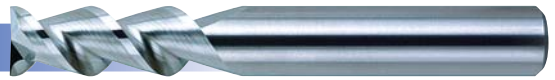
Roughing end mill, Medium cut length, 3 flute

C-SRARB

Corner radius roughing end mill, Short cut length, 3 flute

11 different sizes available

ø3-ø25mm



15 different sizes available

ø3-ø20mm



21 different sizes available

ø10-ø26mm



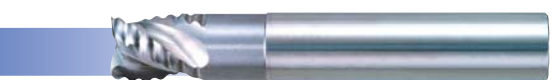
22 different sizes available

ø12×R1-ø25×R5mm



7 different sizes available

ø10-ø25mm



10 different sizes available

ø3-ø25mm



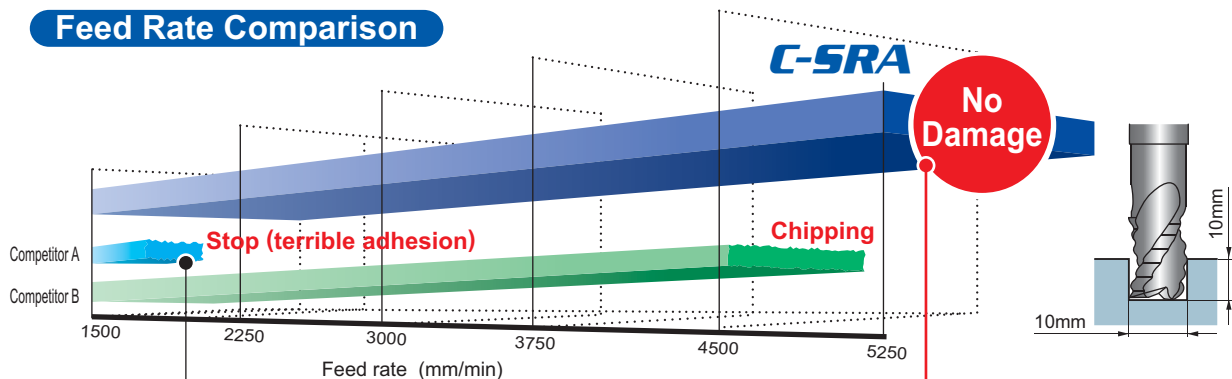
11 different sizes available

ø10×R1-ø25×R5mm



Machining Example 2

Feed Rate Comparison



Feed rate 2250mm/min



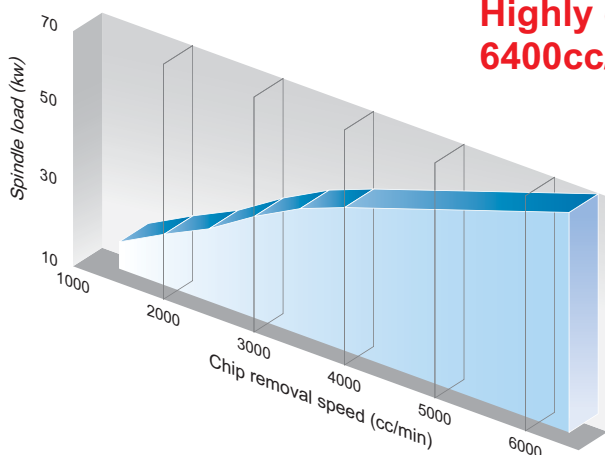
No damage

| | |
|------------|-----------------------------------|
| End mill | CSRAD1000 (ø10) |
| Workpiece | Aluminium (JIS A7075) |
| Revolution | 10000min ⁻¹ (314m/min) |
| Feed rate | 1500–5250mm/min |
| Coolant | Emulsion |

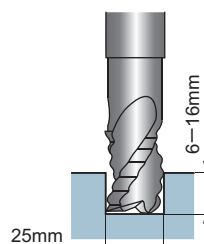
Machining Example 3

Feed rate 5250mm/min

Chip Volume Comparison



Highly efficient milling with 6400cc/min on chip removal!



| | |
|------------|------------------------------------|
| End mill | CSRARB2500R500 (ø25 x R5) |
| Workpiece | Aluminium (DIN7050) |
| Revolution | 24000min ⁻¹ (1885m/min) |
| Feed rate | 10000–16000mm/min |
| Coolant | Emulsion |

CARBIDE END MILLS

C-2MHA

2 flute, Medium cut length, High helix



$D_1 \leq 12$ 0 - -0.020
 $D_1 > 12$ 0 - -0.030

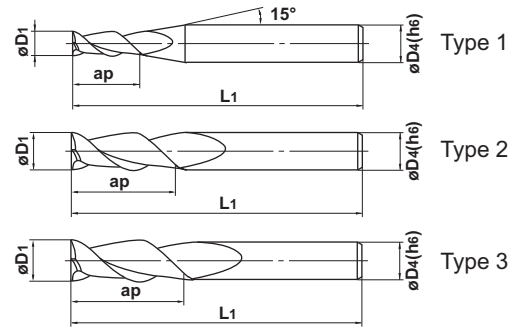


$D_4 = 6$ 0 - -0.008
 $8 \leq D_4 \leq 10$ 0 - -0.009
 $12 \leq D_4 \leq 16$ 0 - -0.011
 $20 \leq D_4 \leq 25$ 0 - -0.013



Helix angle Gash land

● High efficiency machining for aluminium alloys.



Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|--------------|---------|------------------|-------------------|---------------|-----------------|-------|------|
| C2MHAD0300 | 3 | 9 | 60 | 6 | 2 | ● | 1 |
| D0400 | 4 | 12 | 60 | 6 | 2 | ● | 1 |
| D0500 | 5 | 15 | 60 | 6 | 2 | ● | 1 |
| D0600 | 6 | 18 | 60 | 6 | 2 | ● | 2 |
| D0800 | 8 | 20 | 75 | 8 | 2 | ● | 2 |
| D1000 | 10 | 25 | 75 | 10 | 2 | ● | 2 |
| D1200 | 12 | 25 | 75 | 12 | 2 | ● | 2 |
| D1400 | 14 | 32 | 75 | 12 | 2 | ● | 3 |
| D1600 | 16 | 32 | 100 | 16 | 2 | ● | 2 |
| D2000 | 20 | 38 | 125 | 20 | 2 | ● | 2 |
| D2500 | 25 | 38 | 125 | 25 | 2 | ● | 2 |

C-2SA

2 flute, Short cut length, Relieved neck



$D_1 \leq 12$ 0 - -0.020
 $D_1 > 12$ 0 - -0.030

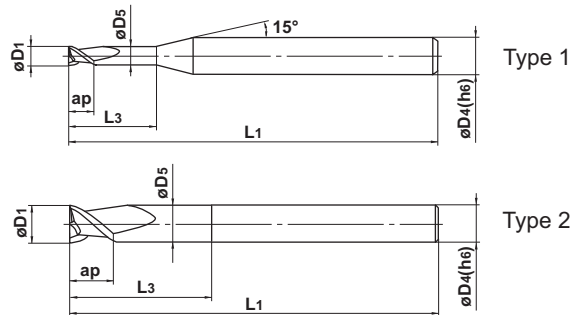


$D_4 = 6$ 0 - -0.008
 $8 \leq D_4 \leq 10$ 0 - -0.009
 $12 \leq D_4 \leq 16$ 0 - -0.011
 $D_4 = 20$ 0 - -0.013



Helix angle Gash land

● High efficiency machining for aluminium alloys.



Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|---------------|---------|------------------|----------------|--------------|-------------------|---------------|-----------------|-------|------|
| C2SAD0300N120 | 3 | 6 | 12 | 2.7 | 60 | 6 | 2 | ● | 1 |
| D0400N120 | 4 | 6 | 12 | 3.7 | 60 | 6 | 2 | ● | 1 |
| D0500N150 | 5 | 8 | 15 | 4.7 | 60 | 6 | 2 | ● | 1 |
| D0600N160 | 6 | 8 | 16 | 5.7 | 75 | 6 | 2 | ● | 2 |
| D0800N200 | 8 | 10 | 20 | 7.4 | 75 | 8 | 2 | ● | 2 |
| D1000N300 | 10 | 12 | 30 | 9.4 | 75 | 10 | 2 | ● | 2 |
| D1000N350 | 10 | 12 | 35 | 9.4 | 100 | 10 | 2 | ● | 2 |
| D1200N300 | 12 | 15 | 30 | 11.4 | 75 | 12 | 2 | ● | 2 |
| D1200N350 | 12 | 15 | 35 | 11.4 | 100 | 12 | 2 | ● | 2 |
| D1200N400 | 12 | 15 | 40 | 11.4 | 125 | 12 | 2 | ● | 2 |
| D1600N300 | 16 | 15 | 30 | 15.4 | 75 | 16 | 2 | ● | 2 |
| D1600N400 | 16 | 15 | 40 | 15.4 | 100 | 16 | 2 | ● | 2 |
| D1600N450 | 16 | 15 | 45 | 15.4 | 125 | 16 | 2 | ● | 2 |
| D2000N400 | 20 | 20 | 40 | 19 | 100 | 20 | 2 | ● | 2 |
| D2000N500 | 20 | 20 | 50 | 19 | 125 | 20 | 2 | ● | 2 |

C-35A

3 flute, Short cut length, Relieved neck



$D1 \leq 12$ 0 - -0.020
 $D1 > 12$ 0 - -0.030

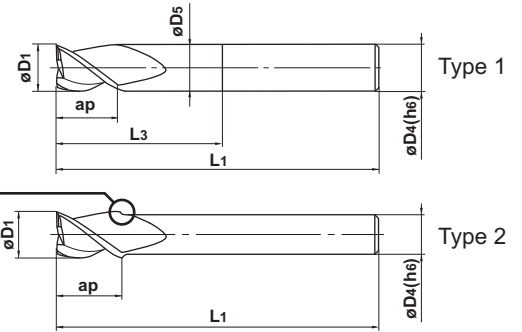
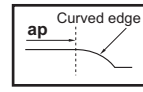


$8 \leq D4 \leq 10$ 0 - -0.009
 $12 \leq D4 \leq 16$ 0 - -0.011
 $20 \leq D4 \leq 25$ 0 - -0.013



Helix angle Gash land

● High efficiency machining for aluminium alloys.



Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|-----------------------------|------------|---------------------|-------------------|-----------------|----------------------|------------------|--------------------|-------|------|
| NEW C3SAD1000A100S08 | 10 | 12 | — | — | 100 | 8 | 3 | ● | 2 |
| D1000N300 | 10 | 12 | 30 | 9.4 | 75 | 10 | 3 | ● | 1 |
| D1000N350 | 10 | 12 | 35 | 9.4 | 100 | 10 | 3 | ● | 1 |
| NEW D1200A150S10 | 12 | 15 | — | — | 150 | 10 | 3 | ● | 2 |
| D1200N300 | 12 | 15 | 30 | 11.4 | 75 | 12 | 3 | ● | 1 |
| D1200N350 | 12 | 15 | 35 | 11.4 | 100 | 12 | 3 | ● | 1 |
| D1200N400 | 12 | 15 | 40 | 11.4 | 125 | 12 | 3 | ● | 1 |
| NEW D1600A200S14 | 16 | 15 | — | — | 200 | 14 | 3 | ● | 2 |
| D1600N300 | 16 | 15 | 30 | 15.4 | 75 | 16 | 3 | ● | 1 |
| D1600N400 | 16 | 15 | 40 | 15.4 | 100 | 16 | 3 | ● | 1 |
| D1600N450 | 16 | 15 | 45 | 15.4 | 125 | 16 | 3 | ● | 1 |
| NEW D1700A150S16 | 17 | 18 | — | — | 150 | 16 | 3 | ● | 2 |
| NEW D1800A200S16 | 18 | 18 | — | — | 200 | 16 | 3 | ● | 2 |
| NEW D2000A200S18 | 20 | 20 | — | — | 200 | 18 | 3 | ● | 2 |
| D2000N400 | 20 | 20 | 40 | 19 | 100 | 20 | 3 | ● | 1 |
| D2000N600 | 20 | 20 | 60 | 19 | 125 | 20 | 3 | ● | 1 |
| D2000N850 | 20 | 20 | 85 | 19 | 150 | 20 | 3 | ● | 1 |
| D2500N500 | 25 | 20 | 50 | 24 | 100 | 25 | 3 | ● | 1 |
| D2500N650 | 25 | 20 | 65 | 24 | 125 | 25 | 3 | ● | 1 |
| D2500N900 | 25 | 20 | 90 | 24 | 150 | 25 | 3 | ● | 1 |
| NEW D2600A200S25 | 26 | 20 | — | — | 200 | 25 | 3 | ● | 2 |

CARBIDE END MILLS

C-3SARB

Corner radius end mill, Short cut length, 3 flute



$D1 \leq 12$ 0 - -0.020
 $D1 > 12$ 0 - -0.030

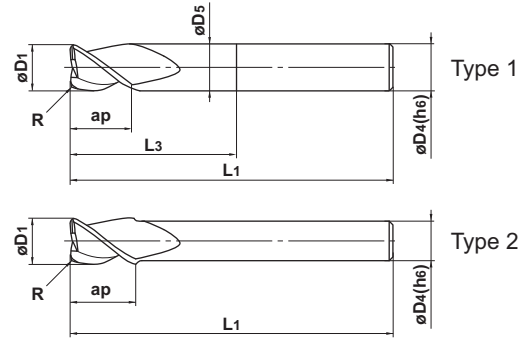


$12 \leq D4 \leq 16$ 0 - -0.011
 $20 \leq D4 \leq 25$ 0 - -0.013



Helix angle

● High efficiency machining for aluminium alloys.



Unit : mm

| Order Number | Dia. D1 | Corner R R | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|----------------------|------------|---------------|---------------------|-------------------|-----------------|----------------------|------------------|--------------------|-------|------|
| C3SARBD1200N0300R100 | 12 | 1 | 15 | 30 | 11.4 | 75 | 12 | 3 | ● | 1 |
| D1200N0300R320 | 12 | 3.2 | 15 | 30 | 11.4 | 75 | 12 | 3 | ● | 1 |
| D1200N0400R100 | 12 | 1 | 15 | 40 | 11.4 | 125 | 12 | 3 | ● | 1 |
| D1200N0400R320 | 12 | 3.2 | 15 | 40 | 11.4 | 125 | 12 | 3 | ● | 1 |
| D1600N0450R100 | 16 | 1 | 15 | 45 | 15.4 | 125 | 16 | 3 | ● | 1 |
| D1600N0450R320 | 16 | 3.2 | 15 | 45 | 15.4 | 125 | 16 | 3 | ● | 1 |
| D1600N0700R100 | 16 | 1 | 15 | 70 | 15.4 | 150 | 16 | 3 | ● | 1 |
| D1600N0700R320 | 16 | 3.2 | 15 | 70 | 15.4 | 150 | 16 | 3 | ● | 1 |
| D1800R100 | 18 | 1 | 18 | — | — | 150 | 16 | 3 | ● | 2 |
| D1800R320 | 18 | 3.2 | 18 | — | — | 150 | 16 | 3 | ● | 2 |
| D2000N0600R100 | 20 | 1 | 20 | 60 | 18.0 | 125 | 20 | 3 | ● | 1 |
| D2000N0600R320 | 20 | 3.2 | 20 | 60 | 18.0 | 125 | 20 | 3 | ● | 1 |
| D2000N0600R400 | 20 | 4 | 20 | 60 | 18.0 | 125 | 20 | 3 | ● | 1 |
| D2000N0850R100 | 20 | 1 | 20 | 85 | 18.0 | 150 | 20 | 3 | ● | 1 |
| D2000N0850R320 | 20 | 3.2 | 20 | 85 | 18.0 | 150 | 20 | 3 | ● | 1 |
| D2000N0850R400 | 20 | 4 | 20 | 85 | 18.0 | 150 | 20 | 3 | ● | 1 |
| D2500N0650R320 | 25 | 3.2 | 20 | 65 | 23.0 | 125 | 25 | 3 | ● | 1 |
| D2500N0650R400 | 25 | 4 | 20 | 65 | 23.0 | 125 | 25 | 3 | ● | 1 |
| D2500N0650R500 | 25 | 5 | 20 | 65 | 23.0 | 125 | 25 | 3 | ● | 1 |
| D2500N0900R320 | 25 | 3.2 | 20 | 90 | 23.0 | 150 | 25 | 3 | ● | 1 |
| D2500N0900R400 | 25 | 4 | 20 | 90 | 23.0 | 150 | 25 | 3 | ● | 1 |
| D2500N0900R500 | 25 | 5 | 20 | 90 | 23.0 | 150 | 25 | 3 | ● | 1 |

C-SRA

Roughing end mill, Short cut length, 3 flute

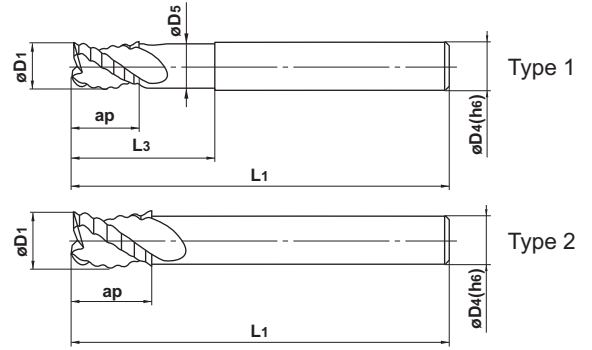


D4 = 10 0 - -0.009
 12 ≤ D4 ≤ 16 0 - -0.011
 20 ≤ D4 ≤ 25 0 - -0.013



Helix angle

● 3 flute uncoated end mill for roughing aluminium alloy.



Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|--------------|------------|---------------------|-------------------|-----------------|----------------------|------------------|--------------------|-------|------|
| CSRAD1000 | 10 | 12 | 25 | 9.4 | 75 | 10 | 3 | ● | 1 |
| D1200 | 12 | 15 | 30 | 11.4 | 75 | 12 | 3 | ● | 1 |
| D1600 | 16 | 18 | 35 | 15.4 | 100 | 16 | 3 | ● | 1 |
| D1800 | 18 | 22 | — | — | 100 | 16 | 3 | ● | 2 |
| D2000 | 20 | 25 | 50 | 18.0 | 125 | 20 | 3 | ● | 1 |
| D2200 | 22 | 25 | — | — | 125 | 20 | 3 | ● | 2 |
| D2500 | 25 | 30 | 60 | 23.0 | 125 | 25 | 3 | ● | 1 |

C-MRA

Roughing end mill, Medium cut length, 3 flute

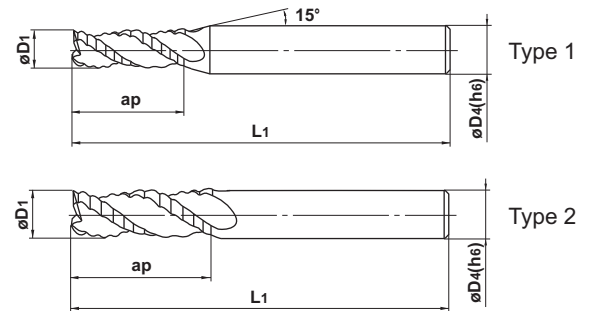


D4 = 6 0 - -0.008
 8 ≤ D4 ≤ 10 0 - -0.009
 12 ≤ D4 ≤ 16 0 - -0.011
 20 ≤ D4 ≤ 25 0 - -0.013



Helix angle

● 3 flute uncoated end mill for roughing aluminium alloy.



Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|--------------|------------|---------------------|----------------------|------------------|--------------------|-------|------|
| CMRAD0300 | 3 | 8 | 50 | 6 | 3 | ● | 1 |
| D0400 | 4 | 11 | 50 | 6 | 3 | ● | 1 |
| D0500 | 5 | 13 | 50 | 6 | 3 | ● | 1 |
| D0600 | 6 | 13 | 50 | 6 | 3 | ● | 2 |
| D0800 | 8 | 19 | 60 | 8 | 3 | ● | 2 |
| D1000 | 10 | 22 | 75 | 10 | 3 | ● | 2 |
| D1200 | 12 | 26 | 75 | 12 | 3 | ● | 2 |
| D1600 | 16 | 32 | 100 | 16 | 3 | ● | 2 |
| D2000 | 20 | 38 | 125 | 20 | 3 | ● | 2 |
| D2500 | 25 | 45 | 125 | 25 | 3 | ● | 2 |

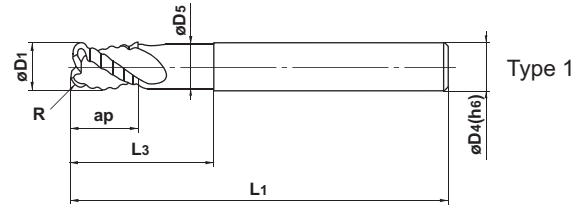
CARBIDE END MILLS

C-SRARB

Corner radius roughing end mill, Short cut length, 3 flute



D4 = 10 0 - -0.009
 12 ≤ D4 ≤ 16 0 - -0.011
 20 ≤ D4 ≤ 25 0 - -0.013



Helix angle

- 3 flute uncoated corner radius end mill for roughing aluminium alloy.

Unit : mm

| Order Number | Dia. D1 | Corner R R | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|-----------------|------------|---------------|---------------------|-------------------|-----------------|----------------------|------------------|--------------------|-------|------|
| CSRARBD1000R100 | 10 | 1 | 12 | 25 | 9.4 | 75 | 10 | 3 | ● | 1 |
| D1000R200 | 10 | 2 | 12 | 25 | 9.4 | 75 | 10 | 3 | ● | 1 |
| D1200R100 | 12 | 1 | 15 | 30 | 11.4 | 75 | 12 | 3 | ● | 1 |
| D1200R200 | 12 | 2 | 15 | 30 | 11.4 | 75 | 12 | 3 | ● | 1 |
| D1600R200 | 16 | 2 | 18 | 35 | 15.4 | 100 | 16 | 3 | ● | 1 |
| D1600R300 | 16 | 3 | 18 | 35 | 15.4 | 100 | 16 | 3 | ● | 1 |
| D2000R200 | 20 | 2 | 25 | 50 | 18.0 | 125 | 20 | 3 | ● | 1 |
| D2000R300 | 20 | 3 | 25 | 50 | 18.0 | 125 | 20 | 3 | ● | 1 |
| D2500R300 | 25 | 3 | 30 | 60 | 23.0 | 125 | 25 | 3 | ● | 1 |
| D2500R400 | 25 | 4 | 30 | 60 | 23.0 | 125 | 25 | 3 | ● | 1 |
| D2500R500 | 25 | 5 | 30 | 60 | 23.0 | 125 | 25 | 3 | ● | 1 |

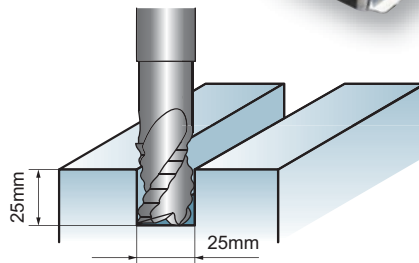
Performance Report

Machining of a Rib.

Chip removal volume of up to 6250cc/min were achieved. Leading to increased machining efficiency.



| | |
|------------------|---|
| End mill | CSRARBD2500R300 (φ25xR3) |
| Workpiece | Aluminium (JIS A7075) |
| Revolution | 15000min ⁻¹ (1178m/min) |
| Feed rate | 10000mm/min (0.222mm/tooth) |
| Machining method | Emulsion |
| Machine | MAX 15000min ⁻¹ , BT50 shank (Max. 75kw spindle) |



C-2MHA

2 flute, Medium cut length, High helix

Shoulder milling

| Work Material | Aluminium Alloy JIS A7075 (excluding low hardness materials such as A1000) | |
|---------------|--|--------------------|
| Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 3 | 40000 | 2400 |
| 4 | 36000 | 2600 |
| 5 | 30000 | 4000 |
| 6 | 27000 | 4000 |
| 8 | 20000 | 4000 |
| 10 | 16000 | 4500 |
| 12 | 13000 | 4500 |
| 16 | 10000 | 4500 |
| 20 | 8000 | 4300 |
| 25 | 6000 | 3600 |

| | | |
|--------------|--|--|
| Depth of Cut | | |
|--------------|--|--|

Slotting

| Work Material | Aluminium Alloy JIS A7075 (excluding low hardness materials such as A1000) | |
|---------------|--|--------------------|
| Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 3 | 40000 | 1500 |
| 4 | 36000 | 1800 |
| 5 | 30000 | 2800 |
| 6 | 27000 | 2800 |
| 8 | 20000 | 2800 |
| 10 | 16000 | 3200 |
| 12 | 13000 | 3200 |
| 16 | 10000 | 3200 |
| 20 | 8000 | 3000 |
| 25 | 6000 | 2500 |

| | | |
|--------------|--|--|
| Depth of Cut | | |
|--------------|--|--|

- 1) Water-soluble cutting fluid is recommended.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.
- 3) Climb cutting is recommended for shoulder milling.
- 4) If tool clamping is poor, the tool can be pulled out of the holder. Ensure that the tool is sufficiently clamped.

C-2SA

2 flute, Short cut length, Relieved neck

Shoulder milling

| Work Material | Aluminium Alloy JIS A7075 | |
|---------------|---------------------------------|--------------------|
| Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 3 | 40000 | 1800 |
| 4 | 36000 | 2400 |
| 5 | 30000 | 3000 |
| 6 | 27000 | 3200 |
| 8 | 20000 | 3400 |
| 10 | 16000 | 3600 |
| 12 | 13000 | 3600 |
| 16 | 10000 | 3600 |
| 20 | 8000 | 3300 |

| | | |
|--------------|--|--|
| Depth of Cut | | |
|--------------|--|--|

Slotting

| Work Material | Aluminium Alloy JIS A7075 | |
|---------------|---------------------------------|--------------------|
| Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 3 | 40000 | 1600 |
| 4 | 36000 | 2100 |
| 5 | 30000 | 2700 |
| 6 | 27000 | 2800 |
| 8 | 20000 | 3000 |
| 10 | 16000 | 3200 |
| 12 | 13000 | 3200 |
| 16 | 10000 | 3200 |
| 20 | 8000 | 3000 |

| | | |
|--------------|--|--|
| Depth of Cut | | |
|--------------|--|--|

- 1) Water-soluble cutting fluid is recommended.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.
- 3) Climb cutting is recommended for shoulder milling.
- 4) If tool clamping is poor, the tool can be pulled out of the holder. Ensure that the tool is sufficiently clamped.
- 5) This table shows the cutting condition with less than 4D overhang length. If more than 4D, spindle speed, feed rate and depth of cut should be reduced.

C-3SA

3 flute, Short cut length, Relieved neck

C-3SARB

Corner radius end mill, Short cut length, 3 flute

Shoulder milling

| Work Material | Aluminium Alloy JIS A7075 | |
|---------------|---------------------------------|--------------------|
| Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 12 | 13000 | 5400 |
| 16 | 10000 | 5400 |
| 18 | 9000 | 5000 |
| 20 | 8000 | 5000 |
| 25 | 6000 | 4500 |

| | | |
|--------------|--------|--|
| Depth of Cut | | |
| | D:Dia. | |

Slotting

| Work Material | Aluminium Alloy JIS A7075 | |
|---------------|---------------------------------|--------------------|
| Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 12 | 13000 | 3200 |
| 16 | 10000 | 3200 |
| 18 | 9000 | 3000 |
| 20 | 8000 | 3000 |
| 25 | 6000 | 2800 |

| | | |
|--------------|--------|--|
| Depth of Cut | | |
| | D:Dia. | |

- 1) Water-soluble cutting fluid is recommended.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately, or set a smaller depth of cut.
- 3) Climb cutting is recommended for shoulder milling.
- 4) This table shows the cutting condition with less than 4D overhang length. If more than 4D, spindle speed, feed rate and depth of cut should be reduced.
- 5) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.

C-SRA

Roughing end mill, Short cut length, 3 flute

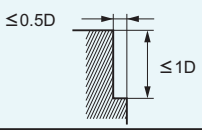
C-SRARB

Corner radius roughing end mill, Short cut length, 3 flute

Shoulder milling

| Work Material | Aluminium Alloy JIS A7075 | | Aluminium Cast JIS AC4B | | |
|---------------|---------------------------|---------------------------------|-------------------------|---------------------------------|--------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 10 | 19000 | 8600 | 9500 | 3400 | |
| 12 | 16000 | 8200 | 8000 | 3200 | |
| 16 | 12000 | 7600 | 6000 | 3100 | |
| 18 | 10500 | 7200 | 5300 | 2900 | |
| 20 | 9500 | 7100 | 4800 | 2900 | |
| 22 | 8500 | 6900 | 4300 | 2800 | |
| 25 | 7500 | 6800 | 3800 | 2700 | |

Depth of Cut

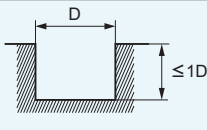


D:Dia.

Slotting

| Work Material | Aluminium Alloy JIS A7075 | | Aluminium Cast JIS AC4B | | |
|---------------|---------------------------|---------------------------------|-------------------------|---------------------------------|--------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 10 | 19000 | 6800 | 9500 | 2700 | |
| 12 | 16000 | 6500 | 8000 | 2600 | |
| 16 | 12000 | 6100 | 6000 | 2400 | |
| 18 | 10500 | 5800 | 5300 | 2400 | |
| 20 | 9500 | 5700 | 4800 | 2300 | |
| 22 | 8500 | 5500 | 4300 | 2200 | |
| 25 | 7500 | 5400 | 3800 | 2200 | |

Depth of Cut



D:Dia.

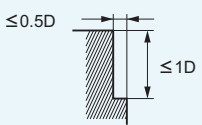
- 1) Water-soluble cutting fluid is recommended.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately, or set a smaller depth of cut.
- 3) Climb cutting is recommended for shoulder milling.
- 4) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 5) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.

Using a high-speed and high-rigidity machining center

Shoulder milling

| Work Material | Aluminium Alloy JIS A7075 | | Aluminium Cast JIS AC4B | | |
|---------------|---------------------------|---------------------------------|-------------------------|---------------------------------|--------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 10 | 30000 | 11000 | 19000 | 5400 | |
| 12 | 30000 | 12000 | 16000 | 5300 | |
| 16 | 24000 | 12000 | 12000 | 4900 | |
| 18 | 21000 | 12000 | 10500 | 4700 | |
| 20 | 19000 | 11000 | 9500 | 4600 | |
| 22 | 17000 | 11000 | 8500 | 4300 | |
| 25 | 15000 | 11000 | 7500 | 4300 | |

Depth of Cut

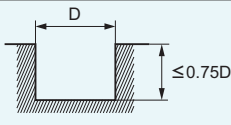


D:Dia.

Slotting

| Work Material | Aluminium Alloy JIS A7075 | | Aluminium Cast JIS AC4B | | |
|---------------|---------------------------|---------------------------------|-------------------------|---------------------------------|--------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 10 | 30000 | 8600 | 19000 | 4300 | |
| 12 | 30000 | 9900 | 16000 | 4300 | |
| 16 | 24000 | 9700 | 12000 | 4000 | |
| 18 | 21000 | 9500 | 10500 | 3800 | |
| 20 | 19000 | 9100 | 9500 | 3700 | |
| 22 | 17000 | 8700 | 8500 | 3400 | |
| 25 | 15000 | 8600 | 7500 | 3400 | |

Depth of Cut



D:Dia.

- 1) Water-soluble cutting fluid is recommended.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately, or set a smaller depth of cut.
- 3) Climb cutting is recommended for shoulder milling.
- 4) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 5) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.

Shoulder milling

| Work Material | Aluminium Alloy JIS A7075 | | Aluminium Cast JIS AC4B | |
|---------------|------------------------------|---------------------------------|----------------------------|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 3 | 40000 | 2700 | 25000 | 1100 |
| 4 | 36000 | 2700 | 20000 | 1100 |
| 5 | 30000 | 5400 | 16000 | 2200 |
| 6 | 27000 | 6100 | 13000 | 2300 |
| 8 | 20000 | 6000 | 10000 | 2400 |
| 10 | 16000 | 5800 | 8000 | 2300 |
| 12 | 13000 | 5300 | 6500 | 2100 |
| 16 | 10000 | 5100 | 5000 | 2000 |
| 20 | 8000 | 4800 | 4000 | 1900 |
| 25 | 6400 | 4600 | 3200 | 1800 |

| | | |
|--------------|---------|--|
| Depth of Cut | | |
| | D: Dia. | |

Slotting

| Work Material | Aluminium Alloy JIS A7075 | | Aluminium Cast JIS AC4B | |
|---------------|------------------------------|---------------------------------|----------------------------|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 3 | 30000 | 1800 | 16000 | 700 |
| 4 | 24000 | 2200 | 12000 | 900 |
| 5 | 19000 | 2300 | 10000 | 900 |
| 6 | 16000 | 2400 | 8000 | 1000 |
| 8 | 12000 | 2500 | 6000 | 1000 |
| 10 | 9500 | 2600 | 5000 | 1100 |
| 12 | 8000 | 2300 | 4000 | 900 |
| 16 | 6000 | 2100 | 3000 | 800 |
| 20 | 4800 | 2000 | 2400 | 800 |
| 25 | 3800 | 2000 | 1900 | 700 |

| | | |
|--------------|---------|--|
| Depth of Cut | | |
| | D: Dia. | |

- 1) Water-soluble cutting fluid is recommended.
- 3) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately, or set a smaller depth of cut.
- 4) Climb cutting is recommended for shoulder milling.
- 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 5) These end mills do not have a centre cutting edge, therefore when entering a workpiece use a ramping process rather than vertical feed.

For Your Safety

●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

MITSUBISHI MATERIALS CORPORATION



MITSUBISHI MATERIALS CORPORATION Area Marketing & Operations Dept.

KFC bldg., 8F, 1-6-1, Yokoami, Sumida-ku, Tokyo 130-0015, Japan
TEL +81-3-5819-8772 FAX +81-3-5819-8774

MMC HARTMETALL GmbH

Comeniusstr.2, 40670, Meerbusch GERMANY
TEL +49-2159-9189-0 FAX +49-2159-918966

MITSUBISHI MATERIALS U.S.A. CORPORATION Headquarters

17401, Eastman Street, Irvine, California, 92614, USA
TEL +1-949-862-5100 FAX +1-949-862-5180

MMC METAL SINGAPORE PTE LTD.

10, Arumugam Road, #04-00 Lion Industrial Bldg., 409957, SINGAPORE
TEL +65-6743-9370 FAX +65-6749-1469

Mitsubishi Carbide Home page : <http://www.mitsubishicarbide.com>

(Tools specifications subject to change without notice.)