April 2025
www.taegutec.com



# NPA

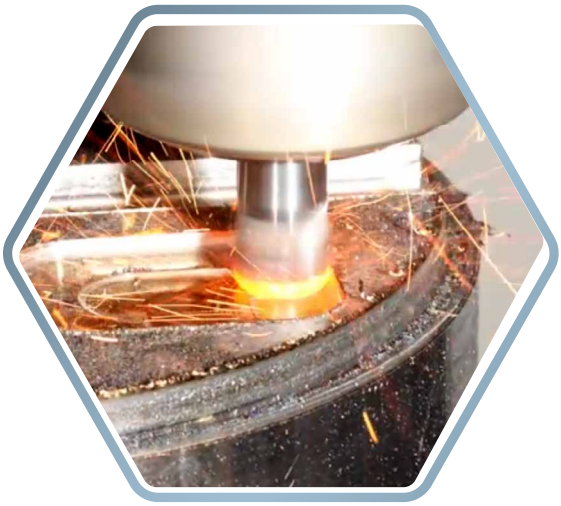
New Product Announcement No. 2025-03

expansion

CERAMICSFEED
HARDPART & EXOTIC MATERIALS

Speed to Feed

## Ceramic End Mills Expansion for HRSA High-speed Milling Solutions



ADVANCE CUTTING
TaeguTec

TaeguTec
Member IMC Group

# KEY POINT

**TaeguTec's CERAMIC-SFEED line now includes brazed ceramic-type end mills and MAXI-RUSH heads.**

TaeguTec's CERAMIC-SFEED product line provides innovative milling solutions for high-speed and high feed machining on heat-resistant alloys. The ceramic end mill type is coated with the TC3030 ceramic grade, which is characterized by excellent heat resistance and high-temperature hardness. It is designed with unevenly spaced cutting edges and a high helix angle for optimized edge geometry. It boasts excellent machining performance and tool life while machining nickel alloys and cobalt alloys at cutting speeds over 700 m/min. In particular, the 6-flute corner radius ceramic end mill is capable of high feed machining in shallow depth of cut conditions, resulting in improved productivity.

The CERAMIC-SFEED product line now offers both ceramic brazed end mills and MAXI-RUSH head types, further expanding its range of tooling options. Ceramic brazed end mills with carbide shanks are less brittle than those with ceramic shanks, minimizing vibrations during operation due to the stronger grip. Additionally, the ceramic brazed MAXI-RUSH heads offer a variety of shank options to accommodate a wide range of machining conditions. The shanks are available in various shapes and materials to suit all cutting conditions.

## NPN


NPN Download

## Youtube


Machining Video Link

## CERAMIC-SFEED product line

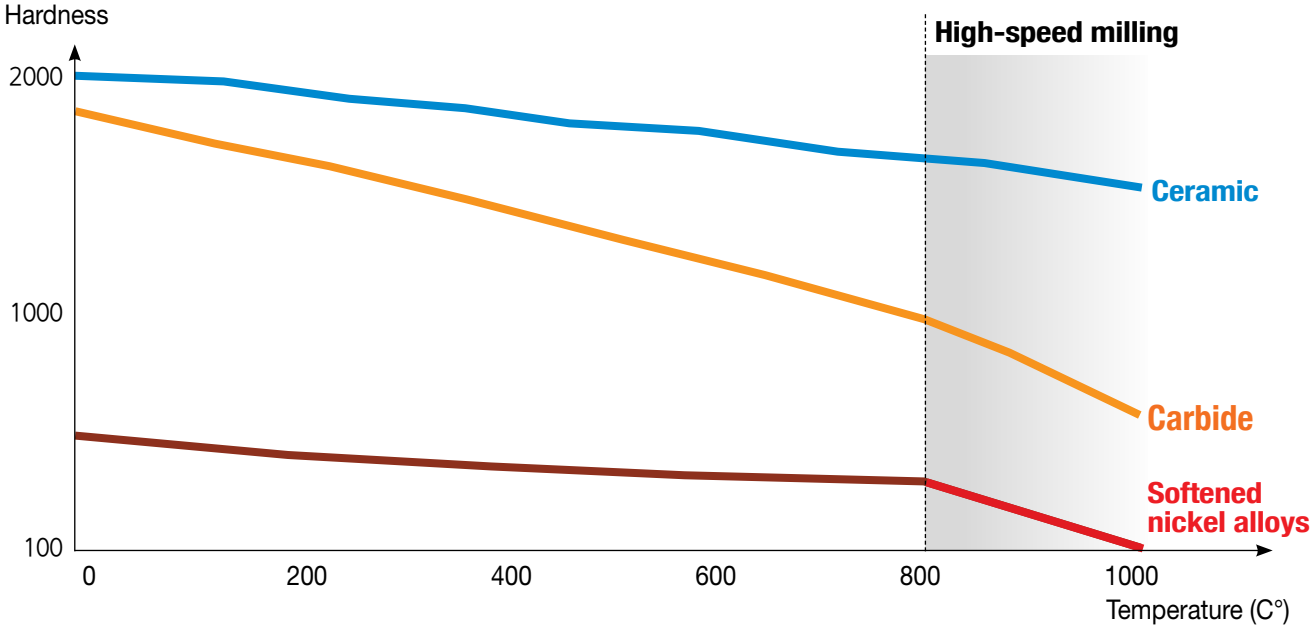
| | | |
|---|---|---|
| new MXCRF |  | 6 flute, corner radius type & ceramic brazed MAXI-RUSH heads<br>Suitable for shouldering, facing and ramping applications<br>Compatible with MAXI-RUSH holders |
| new CRFB 6 |  | 6 flute, corner radius type ceramic brazed end mills<br>Suitable for shouldering, facing and ramping applications |
| CRF 4 |  | 4 flute, corner radius type ceramic end mills<br>Suitable for shouldering, slotting and ramping applications |
| CRF 6 |  | 6 flute, corner radius type ceramic end mills<br>Suitable for shouldering, facing and ramping applications |
| CRH 4 |  | 4 flute, ceramic end mills for high feed machining<br>Suitable for facing, ramping applications |

## Features

- Excellent high-temperature hardness SiAlON series TC3030 ceramic grade
- 700 m/min cutting speed for superior improvement in productivity
- Excellent vibration resistance due to the ceramic-brazed carbide shanks
- MAXI-RUSH heads are compatible with a variety of holders

## HRSA high-speed milling solution with ceramic tools

- Carbide tools experience rapid tool life deterioration at high temperatures. Therefore, cutting speeds around 50 m/min are required when machining heat-resistant alloys. Whereas ceramic tools, characterized by excellent heat resistance but vulnerable to impact, can achieve superior tool life and productivity by generating enough heat to soften the workpiece through high-speed machining. As a result, ceramic tools need to operate at cutting speeds exceeding 700 m/min to produce enough heat in the workpiece. During this machining process, both the tool and the workpiece become red-hot, enabling dynamic rough machining with sparks flying.



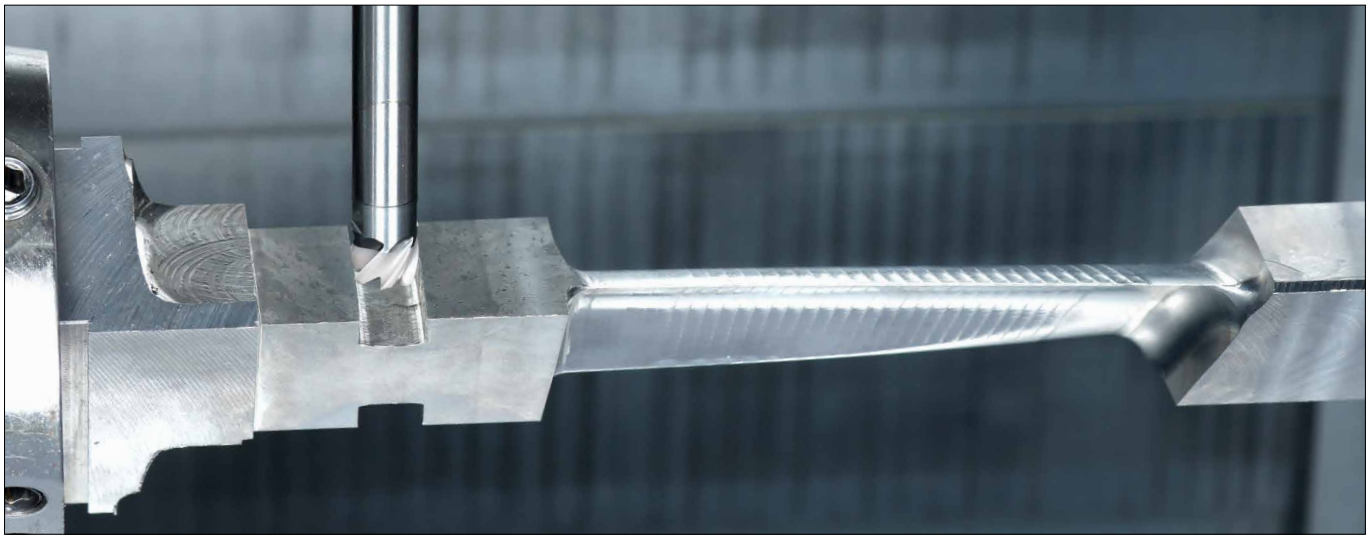

## Ceramic tools application range

- Applicable to nickel- or cobalt-based HRSA roughing
- Suitable for both power generation and aerospace industry parts machining

| Workpiece material type | TC3030 |
|---|---|
| Nickel alloy | Excellent |
| Cobalt alloy | Good |
| Titanium alloy | Not recommended |
| Stainless steel | |





## Availability

In stock

## Price

Available in the GAL system

Sincerely,
TaeguTec

**Sung Chang-ho**
Hole-Making
Adviser

Sincerely,
TaeguTec

**Cheon Dae-jun**
Round Tool & Tooling
Product Manager

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TaeguTec

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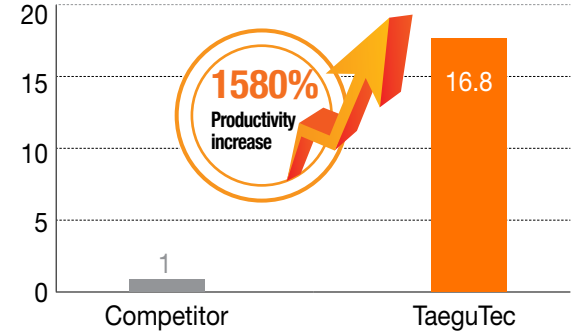
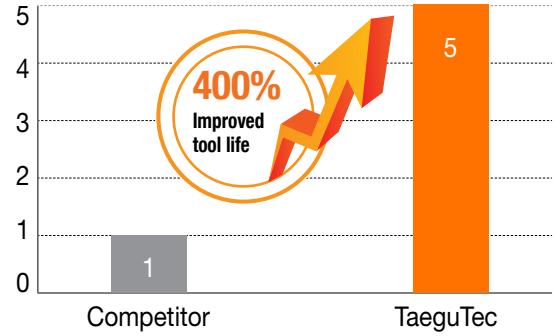
## Case study 1

| | | Competitor | TaeguTec |
|---|---|---|---|
| Material | | Nickel alloys | |
| Application | | Shouldering | |
| Cutter | | Ø16 carbide end mill | MXCRF160L09R20-06S10 TC3030 |
| No. of teeth | | 5 | 6 |
| Cutting speed | V (m/min) | 23 | 700 |
| | RPM | 450 | 14000 |
| Feed | fz (mm/tooth) | 0.02 | 0.05 |
| | F (mm/min) | 40 | 4200 |
| Depth of cut | ap (mm) | 5.0 | 0.8 |
| Cutting width | ae (mm) | 5.0 | |
| Coolant | | Wet | Dry |
| MRR ($cm^3$/min) | | 1 | 16.8 |
| Tool life (pcs) | | 1 | 5 |

MRR ($cm^3$/min)



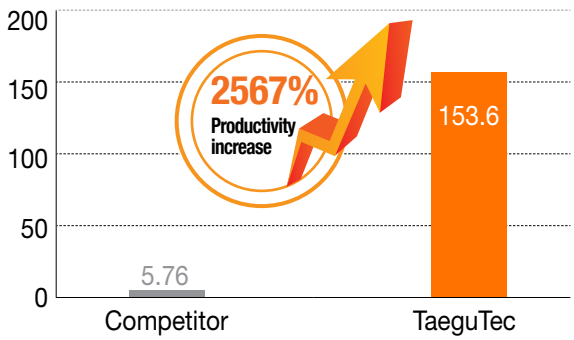

Tool life (pcs)



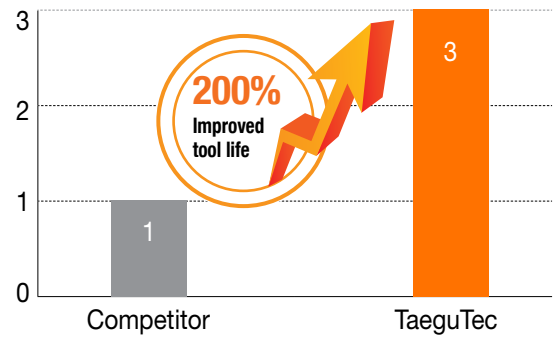

## Case study 2

| | | Competitor | TaeguTec |
|---|---|---|---|
| Material | | Nickel alloys , Inconel 718 (HB250-280) | |
| Application | | Slotting | |
| Cutter | | Ø12 carbide end mill | CRH 4120 TC3030 |
| No. of teeth | | 4 | |
| Cutting speed | V (m/min) | 25 | 750 |
| | RPM | 660 | 20000 |
| Feed | fz (mm/tooth) | 0.03 | 0.2 |
| | F (mm/min) | 80 | 16000 |
| Depth of cut | ap (mm) | 6.0 | 0.8 |
| Cutting width | ae (mm) | 12.0 | |
| Coolant | | Wet | Dry |
| MRR ($cm^3$/min) | | 5.76 | 153.6 |
| Tool life (pcs) | | 1 | 3 |

MRR ($cm^3$/min)




Tool life (pcs)



## MXCRF new

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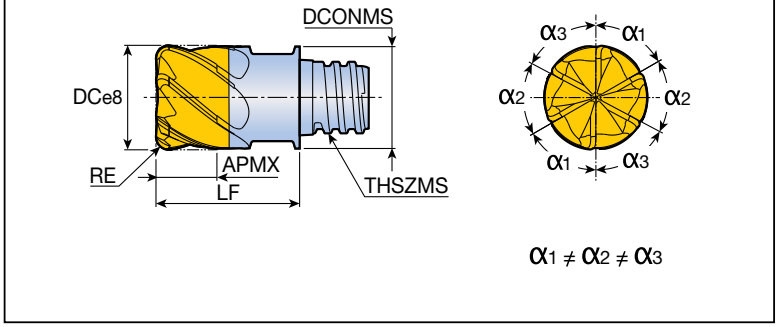
### 6 flute, ceramic brazed heads

6 | H•A 40°




| Designation | | Feed (mm/tooth) | Dimension (mm) | | | | | | Grade |
|---|---|---|---|---|---|---|---|---|---|
| | | | DC | RE | APMX | LF | THSZMS | DCONMS | TC3030 |
| MXCRF | 100L07R10-06S06 | 0.02-0.04 | 10 | 1.0 | 7 | 13.0 | S06 | 9.7 | ● |
| | 120L07R15-06S08 | 0.03-0.05 | 12 | 1.5 | 7 | 16.5 | S08 | 11.7 | ● |
| | 160L09R20-06S10 | 0.03-0.05 | 16 | 2.0 | 9 | 20.5 | S10 | 15.3 | ● |

▸ Wrench should be ordered separately

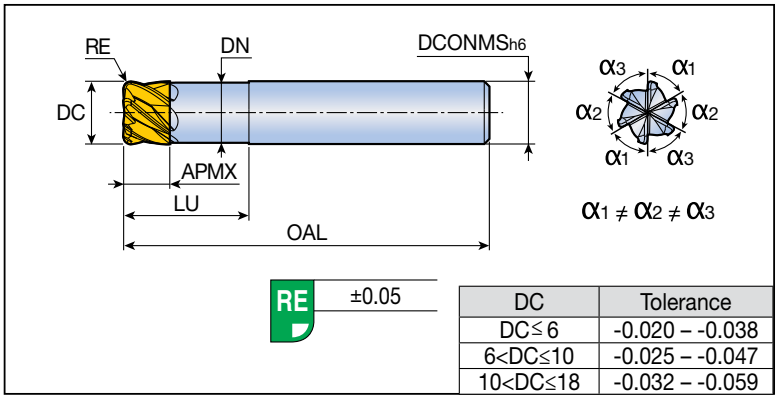
●: Standard items

## CRFB 6 new

CERAMICSFEED HARD PART & EXOTIC MATERIALS

### 6 flute, ceramic brazed end mills

6 | H•A 40°




| DC | Tolerance |
|---|---|
| DC≤6 | -0.020 – -0.038 |
| 6<DC≤10 | -0.025 – -0.047 |
| 10<DC≤18 | -0.032 – -0.059 |

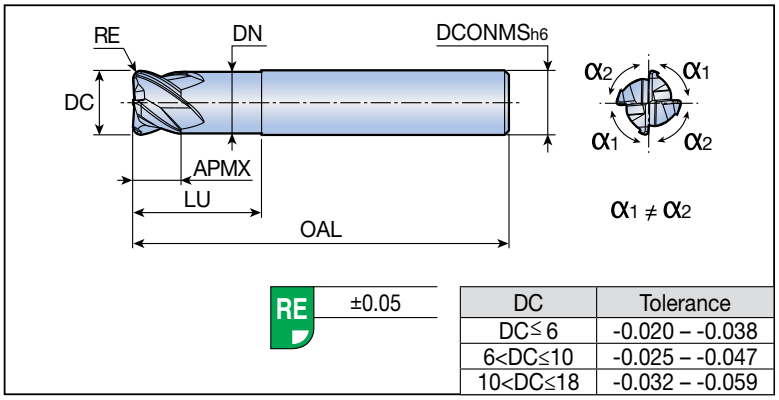
| Designation | | Feed (mm/tooth) | Dimension (mm) | | | | | | Grade |
|---|---|---|---|---|---|---|---|---|---|
| | | | DC | RE | OAL | APMX | LU | DN | DCONMS | TC3030 |
| CRFB | 6060 050 120 | 0.02-0.03 | 6 | 0.5 | 50 | 4.5 | 12 | 5.8 | 6 | ● |
| | 6080 100 160 | 0.02-0.03 | 8 | 1.0 | 57 | 6.0 | 16 | 7.7 | 8 | ● |
| | 6100 100 200 | 0.02-0.04 | 10 | 1.0 | 63 | 7.5 | 20 | 9.6 | 10 | ● |
| | 6120 150 240 | 0.03-0.05 | 12 | 1.5 | 70 | 9.0 | 24 | 11.5 | 12 | ● |
| | 6160 200 320 | 0.03-0.05 | 16 | 2.0 | 83 | 12.0 | 32 | 15.5 | 16 | ● |

●: Standard items

# CRF 4

CERAMICSFEED HARD PART & EXOTIC MATERIALS

## 4 flute, ceramic end mills




4 | H•A 40°

RE ±0.05

| DC | Tolerance |
|---|---|
| DC≤ 6 | -0.020 – -0.038 |
| 6<DC≤10 | -0.025 – -0.047 |
| 10<DC≤18 | -0.032 – -0.059 |

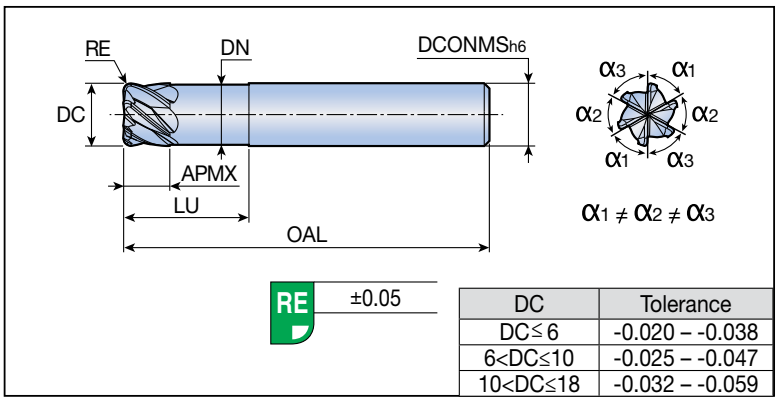
| Designation | Feed (mm/tooth) | Dimension (mm) | | | | | | | Grade |
|---|---|---|---|---|---|---|---|---|---|
| | | DC | RE | OAL | APMX | LU | DN | DCONMS | TC3030 |
| CRF 4060 050 120 | 0.02-0.03 | 6 | 0.5 | 50 | 4.5 | 12 | 5.8 | 6 | ● |
| 4080 100 160 | 0.02-0.03 | 8 | 1.0 | 57 | 6.0 | 16 | 7.7 | 8 | ● |
| 4100 100 200 | 0.02-0.04 | 10 | 1.0 | 63 | 7.5 | 20 | 9.6 | 10 | ● |
| 4120 150 240 | 0.03-0.05 | 12 | 1.5 | 70 | 9.0 | 24 | 11.5 | 12 | ● |
| 4160 200 320 | 0.03-0.05 | 16 | 2.0 | 83 | 12.0 | 32 | 15.5 | 16 | ● |

●: Standard items

# CRF 6

CERAMICSFEED HARD PART & EXOTIC MATERIALS

## 6 flute, ceramic end mills




6 | H•A 40°

RE ±0.05

| DC | Tolerance |
|---|---|
| DC≤ 6 | -0.020 – -0.038 |
| 6<DC≤10 | -0.025 – -0.047 |
| 10<DC≤18 | -0.032 – -0.059 |

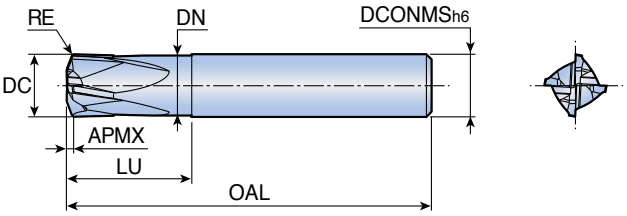
| Designation | Feed (mm/tooth) | Dimension (mm) | | | | | | | Grade |
|---|---|---|---|---|---|---|---|---|---|
| | | DC | RE | OAL | APMX | LU | DN | DCONMS | TC3030 |
| CRF 6060 050 120 | 0.02-0.03 | 6 | 0.5 | 50 | 4.5 | 12 | 5.8 | 6 | ● |
| 6080 100 160 | 0.02-0.03 | 8 | 1.0 | 57 | 6.0 | 16 | 7.7 | 8 | ● |
| 6100 100 200 | 0.02-0.04 | 10 | 1.0 | 63 | 7.5 | 20 | 9.6 | 10 | ● |
| 6120 150 240 | 0.03-0.05 | 12 | 1.5 | 70 | 9.0 | 24 | 11.5 | 12 | ● |
| 6160 200 320 | 0.03-0.05 | 16 | 2.0 | 83 | 12.0 | 32 | 15.5 | 16 | ● |

●: Standard items

# CRH 4

CERAMICSFEED
HARD PART & EXOTIC MATERIALS

## 4 flute, ceramic end mills for high feed milling


RE ±0.1

| DC | Tolerance |
|---|---|
| DC≤ 6 | -0.020 – -0.038 |
| 6<DC≤10 | -0.025 – -0.047 |
| 10<DC≤18 | -0.032 – -0.059 |

| Designation | | Feed (mm/tooth) | Dimension (mm) | | | | | | | Grade |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | DC | RE | OAL | APMX | LU | DN | DCONMS | TC3030 |
| **CRH** | **4060** | 0.1-0.15 | 6 | 0.7 | 50 | 0.55 | 12 | 5.8 | 6 | ● |
| | **4080** | 0.1-0.2 | 8 | 0.9 | 57 | 0.75 | 16 | 7.7 | 8 | ● |
| | **4100** | 0.1-0.2 | 10 | 1.0 | 63 | 0.85 | 20 | 9.6 | 10 | ● |
| | **4120** | 0.1-0.3 | 12 | 1.4 | 70 | 1.15 | 24 | 11.5 | 12 | ● |
| | **4160** | 0.1-0.3 | 16 | 1.8 | 83 | 1.55 | 32 | 15.5 | 16 | ● |

▸ RE: Program corner R

●: Standard items

# Recommended Cutting Conditions

CERAMICSFEED
HARD PART & EXOTIC MATERIALS

## Machining data for ceramic end mill

### CRF 4 teeth & 6 teeth

(Unit: mm)

| Diameter | Cutting speed (m/min) | Feed (mm/tooth) | Shouldering, profiling | | Slotting |
|---|---|---|---|---|---|
| | | | ap | ae | ap |
| Ø6 | 300-1000 | 0.02-0.03 | -0.6xD | -0.1xD | -0.05xD |
| Ø8 | 300-1000 | 0.02-0.03 | -0.6xD | -0.1xD | -0.05xD |
| Ø10 | 300-1000 | 0.02-0.04 | -0.6xD | -0.1xD | -0.05xD |
| Ø12 | 300-1000 | 0.03-0.05 | -0.6xD | -0.1xD | -0.05xD |
| Ø16 | 300-1000 | 0.03-0.05 | -0.6xD | -0.1xD | -0.05xD |

- ap must not exceed a maximum 1 mm
- Apply a 30% reduction in feed during slotting, ramping (less 2.5°)

ap: axial direction DOC
ae: radial direction DOC

### CRH 4 teeth

(Unit: mm)

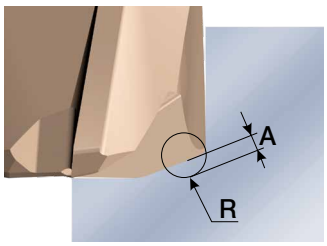
| Diameter | Cutting speed (m/min) | Feed (mm/tooth) | Shouldering, profiling | |
|---|---|---|---|---|
| | | | ap | ae |
| Ø6 | 300-1000 | 0.1-0.15 | -0.05xD | -0.6xD |
| Ø8 | 300-1000 | 0.1-0.2 | -0.05xD | -0.6xD |
| Ø10 | 300-1000 | 0.1-0.2 | -0.05xD | -0.6xD |
| Ø12 | 300-1000 | 0.1-0.3 | -0.05xD | -0.6xD |
| Ø16 | 300-1000 | 0.1-0.3 | -0.05xD | -0.6xD |

- ap must not exceed a maximum 1 mm
- Apply a 30% reduction in feed during ramping (less 2.5°)

ap: axial direction DOC
ae: radial direction DOC

### Programming tip - CRH

| Diameter (CRH 4 teeth) | R (Program) | A Un-machined material thickness |
|---|---|---|
| Ø6 | 0.7 | 0.35 |
| Ø8 | 0.9 | 0.47 |
| Ø10 | 1.0 | 0.50 |
| Ø12 | 1.4 | 0.70 |
| Ø16 | 1.8 | 0.95 |




# Optimal conditions for TaeguTec ceramic end mills

| Recommendations | Details | Remarks |
|---|---|---|
| Down cutting | Down cutting is highly recommended<br>Up cutting can lead to rapid wear of the cutting edge and the possibility of the workpiece material's hardened surface | Finish margin: over 0.3 mm |
| High cutting speed | By maintaining a high cutting speed, the cutting tool minimizes wear and damage by generating the heat needed to soften the material | |
| Do not use coolant | To prevent the occurrence of thermal crack, it is recommended not to use coolant or air blowing | Air blowing is only recommended for use when good chip evacuation is required |
| Tool holder | Recommendation for tool holding is a hydraulic chuck or a precision milling chuck for stable machining | Heating chuck is disabled |
| Do not remove built-up-edges | Do not manually remove any built-up-edge as this may cause damage to the insert's cutting edge | |