KYOCERA

Next-generation
PVD coating for milling | PR18 Series

# PR18 Series

NEW

## Longer tool life with next-generation coating for milling

**MEGACOAT NANO EX coating technology**
**Exceptional tool life**

MEGACOAT NANO EX | Milling

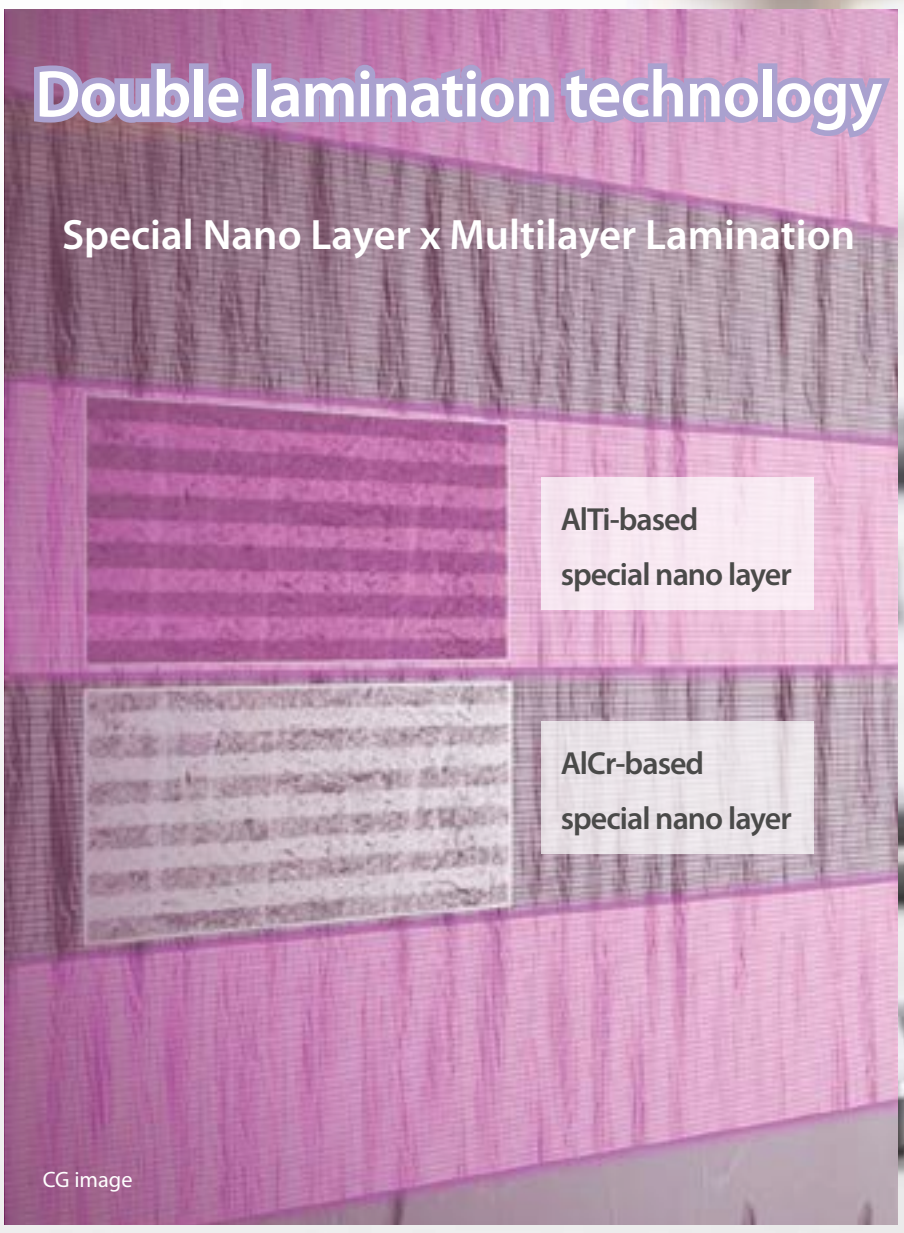
**PR1825** for steel (Wear resistance oriented)
**PR1835** for steel (Stability oriented)
for stainless steel
**PR1810** for cast iron

Next-generation PVD coating for milling

# PR18 Series

**Double lamination technology with special nano layer**
**MEGACOAT NANO EX provides longer tool life**
**PR18 Series grades are applicable for various machining environments.**

MEGACOAT NANO EX | Milling |




# 1 New PVD coating MEGACOAT NANO EX provides long tool life

**Kyocera's nano layer coating technology**

## MEGACOAT NANO

Special nano-laminated coating
with excellent abrasion and oxidation resistance

MEGACOAT-based
Laminated structure

- High hardness
- Excellent oxidation resistance

## MEGACOAT NANO EX
### New coating property improvements

MEGACOAT NANO EX | Milling

**Double lamination technology maintains longer tool life**

Multi-layer structure with two unique nano layers
Superior abrasion resistance and fracture resistance

## Special nano layer x Multilayer lamination

Nano-layer

High toughness
suppresses crack growth

**AlCr-based coating**
with excellent abrasion resistance

Nano-layer

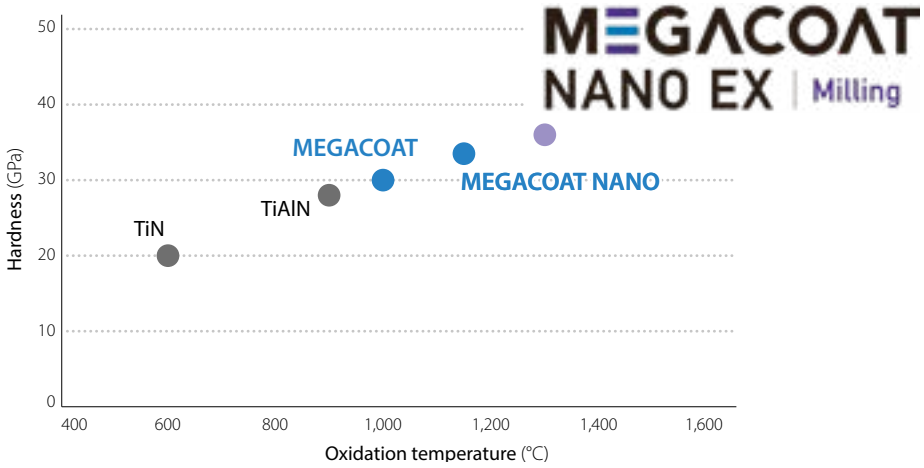
High toughness
suppresses crack growth

**AlTi-based coating**
with excellent heat resistance

**Multi-layering of high-performance nano layers**
Increases toughness with the suppression of crack growth and optimization of internal stress

CG image

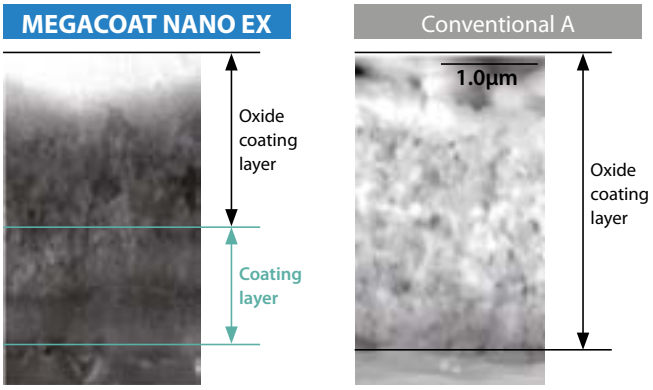
Coating characteristics (Internal evaluation)




## Excellent oxidation resistance

Oxidation progression comparison (Internal evaluation)

**Suppresses oxidation progression with excellent oxidation resistance**

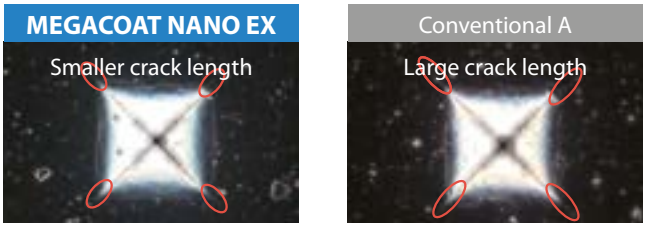


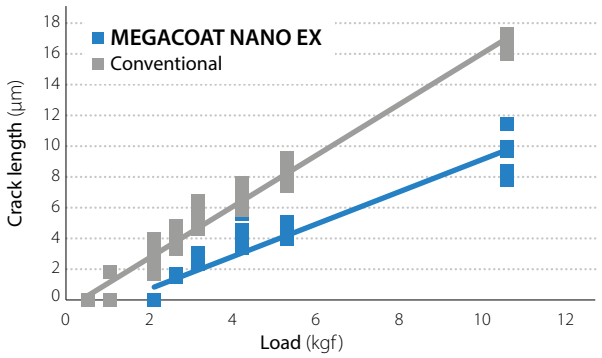

*Section after holding at 1,200 degrees for 30 minutes in air

## High coating toughness

Coating layer toughness evaluation (Internal evaluation)

**Excellent coating toughness with small crack length**




*Micro-Vickers measurement

**Case study**

## 2x longer tool life. Cutting edge remains in good condition.

### Guides S50C

Edge condition


**MEGACOAT NANO EX has 2x longer tool life than conventional coating. The cutting edge remains in good condition. Quiet cutting noise**

Cutting conditions: Vc = 200 m/min, ap = 2.0 mm, fz = 0.13 mm/t, Dry BDMT170408ER-JT (PR1825) MEC ø25 (2 Inserts) (User evaluation)

## Case Studies

### Mechanical parts S45C

MA90

Vc = 160 m/min
ap = 1.0 mm
fz = 0.15 mm/t
Wet
MA90-25S20-09T3C
LOGU090408ER-GM

**Number of parts**

PR1825 **15** pcs/corner — 2.5x Tool life

Conventional C **6** pcs/corner

Proprietary insert shape suppresses wear progression of main cutting edge and wiper edge
Provides superior surface finish and 2.5x longer tool life

(User evaluation)

### Housing SUS316

MB45

Vc = 90 m/min
ap = 2.0 mm
fz = 0.18 mm/t
Dry
MB45-063R-14T5C-M
SNMU1406ANER-GM

**Number of parts**

PR1825 **30** pcs/corner — 1.6x Tool life

Conventional D **18** pcs/corner

Unique low cutting force wiper edge design reduces chattering
Shows 1.6x longer tool life

(User evaluation)

### General machine parts FCD450

MFWN

Vc = 120 m/min
ap = 1.0 mm
fz = 0.19 mm/t
Dry
MFWN90080R-S32-5T
WNMU080608EN-GM

**Number of parts**

PR1825 **65** pcs/corner — 1.6x Tool life

Conventional E **40** pcs/corner

Shows stable machining without insert fracture
Shows 1.6x longer tool life

(User evaluation)

### Mechanical parts SCM420

MECH

Vc = 130 m/min
ap = 13.0 mm
fz = 0.07 mm/t
Wet
MECH025-S25-11-4-2T
BDMT11T308ER-N2/N3

**Number of parts**

PR1825 **6** pcs/corner (Cutting distance : 38.1 m) — 1.5x Tool life

Conventional F **4** pcs/corner (Cutting distance : 25.4 m)

Good cutting edge condition in heavy machining with large D.O.C.
1.5x longer tool life

(User evaluation)

### Mold parts Plastic mold steel

MFH Mini

Vc = 120 m/min
ap = 0.3 mm
fz = 1.3 mm/t
Wet
MFH25-S25-03-5T
LOGU030310ER-GM

**Number of parts**

PR1835 **150** pcs/corner — 2.5x Tool life

Conventional G **60** pcs/corner

Stable machining without chatter even in high-feed machining
Maintains good cutting edge condition and achieves 2.5x longer tool life

(User evaluation)

### Body parts FC250

MFPN45

Vc = 360 m/min
ap = 0.35 mm
fz = 0.08 mm/t
Wet
MFPN45100R-8T
PNMU1205ANER-GH

**Number of parts**

PR1810 **200** pcs/corner — 2x Tool life

Conventional H **100** pcs/corner

Improved tool life and 10 corners on both sides for significant cost savings

(User evaluation)

# 2 Compatible with various machining environments. Substantial lineup

**PR1825** **P** for steel (Wear resistance oriented)

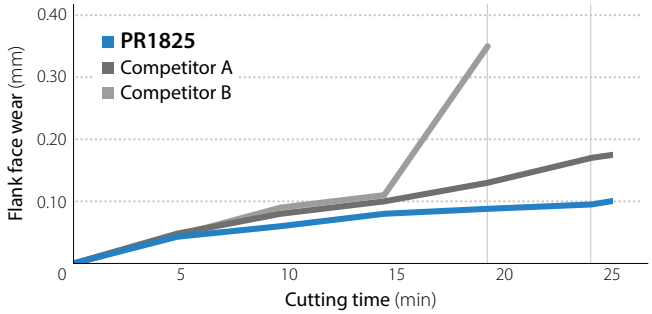
**PR1835** **M** for steel (Stability oriented)
for stainless steel (1st recommendation)

**PR1810** **K** for cast iron

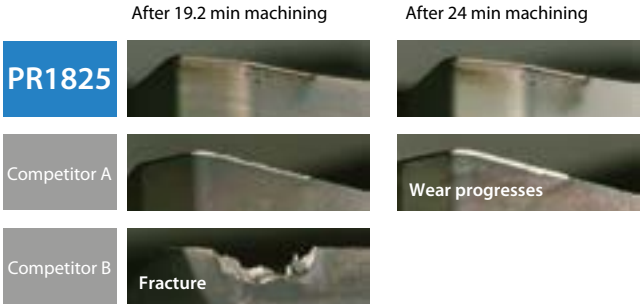
| Workpiece material | P Steel | | | | | M Stainless steel | | | | | K Cast iron | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | 01 | 10 | 20 | 30 | 40 | 01 | 10 | 20 | 30 | 40 | 01 | 10 | 20 | 30 | 40 |
| Lineup | | Wear resistance oriented PR1825 | Stability oriented PR1835 | | | | 1st recommendation PR1835 | | | | | 1st recommendation PR1810 | | | |

## PR1825 Carbide base material with an excellent balance of hardness, toughness and versatility

### Wear resistance comparison (Internal evaluation)




### Edge condition

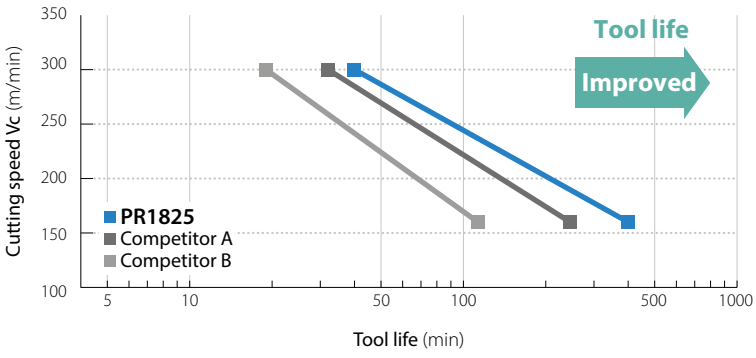



Cutting Conditions : Vc = 150 m/min, ap x ae = 2 mm x 65 mm, fz = 0.12 mm/t, SKD11, Dry PNMU1205ANER-GM (MFPN45)

### V-T graph (Internal evaluation)

Life criteria :
Flank face wear = 0.10 mm

Cutting Conditions :
Vc = **160 / 300** m/min
ap x ae = 2 x 110 mm, fz = 0.12 mm/t
SCM440 Dry
PNMU1205ANER-GM (MFPN45)



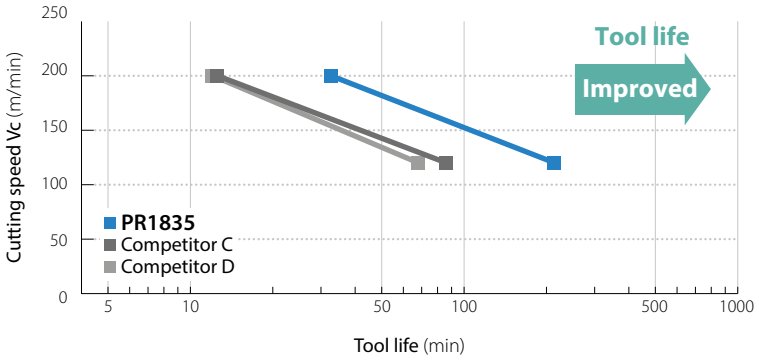
## PR1835

Carbide base material with superior impact resistance and stability oriented
Improves the toughness of the base material by optimizing the particle shape and homogenizing the structure.

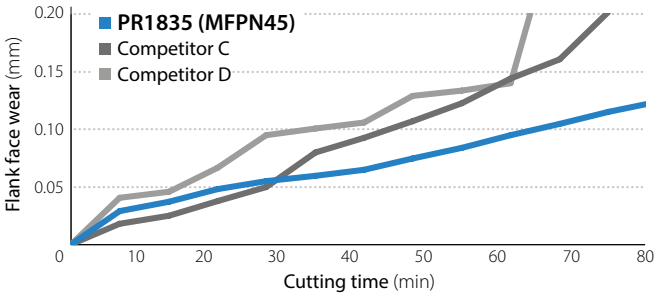
### V-T graph (Internal evaluation)

Life criteria :
Flank face wear = 0.10 mm

Cutting Conditions :
Vc = **120 / 200** m/min
ap x ae = 2 x 110 mm, fz = 0.12 mm/t
SUS304 Dry
PNMU1205ANER-SM (MFPN45)

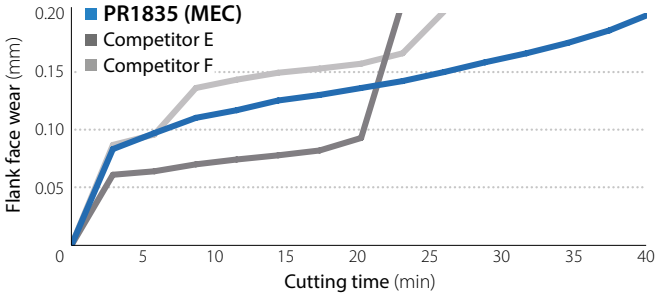



### Wear resistance comparison (Internal evaluation)




Cutting Conditions : Vc = 150 m/min, ap x ae = 2 x 80 mm, fz = 0.1 mm/t
SUS304, Dry PNMU1205ANER-SM

### Wear resistance comparison (Internal evaluation)

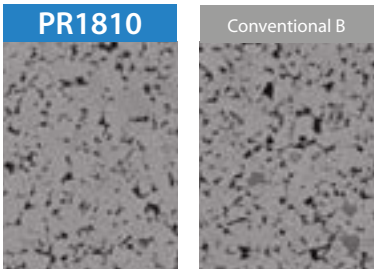



Cutting Conditions : Vc = 120 m/min, ap x ae = 2 x 15 mm, fz = 0.1 mm/t
SUS304, Dry BDMT11T308ER-JS

## PR1810

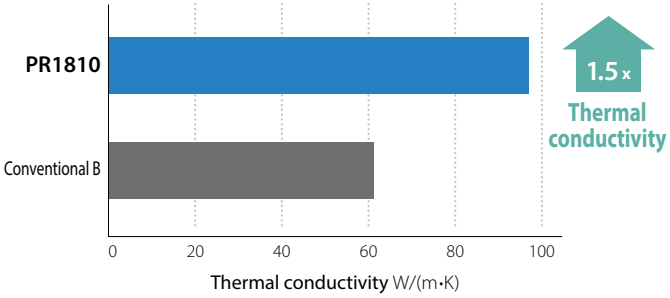
Uses a proprietary base material with excellent thermal conductivity.
Achieving stable processing of cast iron

### Carbide Substrate



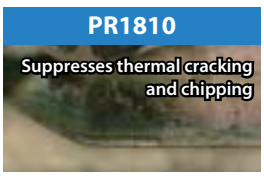

Coarse fine granules | Fine grain

### Thermal conductivity comparison (Internal evaluation)




### Cutting edge condition (Internal evaluation)

After about 60 min machining




Cutting Conditions :
Vc = 200 m/min
ap x ae = 2 x 85 mm
fz = 0.2 mm/t
FCD450, Wet
PNMU1205ANER-GM (MFPN45)

PR1810 uses a mixture of coarse and fine grains. Improved thermal conductivity and reduced thermal cracking and chipping

## Product lineup

### PR18 series for various applications

## 90° cutting edge angle type

Shouldering | Slotting | Facing

### Double-sided inserts

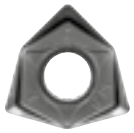
Tangential 90° end mill with 4-edge Inserts
**MA90** NEW →P9

Original tangential 90° end mill with economical 4-edge inserts

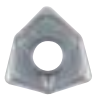
90° end mill with double sided 4-edge inserts
**MEW** →P9

90° helical end mill with double sided 4-edge inserts
**MEWH** →P9

Double-sided 6-edge inserts, low cutting force cutter
**MFWN** →P13



Double-sided 6-edge inserts, low cutting force cutter
**MFWN Mini** →P13



4-edge face mill with vertical inserts for heavy milling
**MFLN90** →P15

Highly efficient cutter with a 88° cutting edge angle
**MFSN88** 88° cutting edge angle →P15

## 90° cutting edge angle type

Shouldering | Slotting | Facing

### Single-sided inserts

High-efficiency end mill
**MEC** →P11

High-efficiency helical end mill
**MECH** →P11

High-efficiency and low-cutting-force end mill
**MECX** →P11

High-efficiency face mill for heavy milling
**MSRS90** →P17

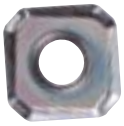
High-efficiency face mill for heavy milling
**MSR** →P17

## Product lineup

### 45° cutting edge angle type

Facing

New 45° general purpose cutter
**MB45** NEW →P19

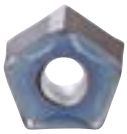


Delivers the "low cutting force" benefits of positive inserts
and the "fracture resistance" benefits of negative inserts. Excellent surface finish

45° face mill with double sided 10-edge inserts
**MFPN45** →P19

High precision and high efficiency high rake cutter
**MFSE45** →P21

Highly efficient cutter with a 66° cutting edge angle
**MFPN66** 66° cutting edge angle →P21



### 45°/70°/75° cutting edge angle type

Facing

4-edge face mill with vertical inserts for heavy milling
**MFLN45/MFLN70** →P23

High-efficiency face mill for heavy milling
**MSRS15** 75° cutting edge angle →P23

High efficiency multi-edge cutter for cast iron
**MFK** 70° cutting edge angle →P23

### High feed cutter

Shouldering Slotting Pocketing Facing

High efficiency and high feed cutter
**MFH Series** →P25-28

High feed and large depth of cut milling
**MFH Boost**

Micro dia. cutter for high feed machining
**MFH Micro**

Small dia. cutter for high feed machining
**MFH Mini**

Highly efficiency and high feed cutter
**MFH Harrier**

### Radius cutter

Shouldering Pocketing Facing

High-efficiency radius cutter with multiple edges
**MRW** →P29

Low-cutting-force and high-efficiency radius cutter
**MRX** →P29

### Others

Multi-function end mill
**MEY** →P31

Chamfering end mill
**MCSE** →P31

Bolt countersink end mill
**MEF** →P31

T-slot mill
**METS** →P31

A lineup of milling insert supporting ISO standard is available.

Tangential 90° end mill with 4-edge inserts

# MA90

NEW

**Original tangential 90° end mill with economical 4-edge inserts**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  General purpose (G-Class) | LOGU | 090404ER-GM | ● | ● | ● |
| | | 090408ER-GM | ● | ● | ● |
| | | 090412ER-GM | ● | ● | ● |
| | | 090416ER-GM | ● | ● | ● |
|  Low cutting force (G-Class) | LOGU | 090404ER-SM | ● | ● | – |
| | | 090408ER-SM | ● | ● | – |
| | | 090412ER-SM | ● | ● | – |
| | | 090416ER-SM | ● | ● | – |
|  Tough edge (G-class) | LOGU | 090408ER-GH | ● | ● | ● |
|  General purpose (G-Class) | LOGU | 120604ER-GM | ● | ● | ● |
| | | 120608ER-GM | ● | ● | ● |
| | | 120612ER-GM | ● | ● | ● |
| | | 120616ER-GM | ● | ● | ● |
| | | 120620ER-GM | ● | ● | ● |
| | | 120624ER-GM | ● | ● | ● |
| | | 120630ER-GM | ● | ● | ● |
|  Low cutting force (G-Class) | LOGU | 120604ER-SM | ● | ● | – |
| | | 120608ER-SM | ● | ● | – |
| | | 120612ER-SM | ● | ● | – |
| | | 120616ER-SM | ● | ● | – |
| | | 120620ER-SM | ● | ● | – |
| | | 120624ER-SM | ● | ● | – |
| | | 120630ER-SM | ● | ● | – |
|  Tough edge (G-class) | LOGU | 120608ER-GH | ● | ● | ● |

Right-handed insert shown

● : Available

90° end mill with double sided 4-edge inserts

# MEW/MEWH

**Reduces cutting force equivalent to positive inserts**
**Excellent surface finish**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  General purpose | LOMU | 100404ER-GM | ● | ● | ● |
| | | 100408ER-GM | ● | ● | ● |
| | | 100412ER-GM | ● | ● | ● |
| | | 100416ER-GM | ● | ● | ● |
| | | 100420ER-GM | ● | ● | ● |
| | LOMU | 150504ER-GM | ● | ● | ● |
| | | 150508ER-GM | ● | ● | ● |
| | | 150510ER-GM | ● | – | – |
| | | 150512ER-GM | ● | ● | ● |
| | | 150516ER-GM | ● | ● | ● |
| | | 150520ER-GM | ● | ● | ● |
|  Low cutting force | LOMU | 100408ER-SM | ● | ● | ● |
| | LOMU | 150508ER-SM | ● | ● | ● |
|  Tough edge (for heavy cutting) | LOMU | 100408ER-GH | ● | ● | ● |
| | LOMU | 150508ER-GH | ● | ● | ● |

Right-handed insert shown

● : Available

# MA90

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ★ 100 – **160** – 200 | ☆ 100 – **160** – 200 | – |
| Martensitic stainless steel | – | ☆ 150 – **200** – 250 *1 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | ★ 20 – **30** – 50 | – |
| Titanium alloy (Ti -6Al -4 V) | – | ☆ 20 – **50** – 70 *2 | – |

*1 CA6535: 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*2 PR1835 (Low Cutting Force ): 1st Recommendation for Titanium alloy (Ti-6Al-4V)

# MEW/MEWH

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ★ 100 – **160** – 200 | ☆ 100 – **160** – 200 | – |
| Martensitic stainless steel | – | ☆ 150 – **200** – 250 *1 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | ☆ 20 – **30** – 50 *2 | – |
| Titanium alloy (Ti -6Al -4 V) | – | ☆ 30 – **50** – 70 *3 | 30 – **50** – 70 |

*1 CA6535: 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*2 PR1535 : 1st Recommendation for Ni-based heat resistant alloys
*3 PR1535 : 1st Recommendation for Titanium alloy (Ti-6Al-4V)

High-efficiency end mill

# MEC

**Excellent surface finish with low cutting forces**
**Large lineup for various applications**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  | BDMT | 110302ER-JT | ● | ● | ● |
| | | 110304ER-JT | ● | ● | ● |
| | | 110308ER-JT | ● | ● | ● |
| | BDMT | 11T302ER-JT | ● | ● | ● |
| | | 11T304ER-JT | ● | ● | ● |
| | | 11T308ER-JT | ● | ● | ● |
| | | 11T312ER-JT | ● | ● | ● |
| | | 11T316ER-JT | ● | ● | ● |
| | | 11T320ER-JT | ● | ● | ● |
| | | 11T324ER-JT | ● | ● | ● |
| | | 11T331ER-JT | ● | ● | ● |
| | BDMT | 170404ER-JT | ● | ● | ● |
| | | 170408ER-JT | ● | ● | ● |
| | | 170412ER-JT | ● | ● | ● |
| | | 170416ER-JT | ● | ● | ● |
| | | 170420ER-JT | ● | ● | ● |
| | | 170424ER-JT | ● | ● | ● |
| | | 170431ER-JT | ● | ● | ● |
| | | 170440ER-JT | ● | ● | ● |
|  Low cutting force/ for stainless steel | BDMT | 110302ER-JS | ● | ● | – |
| | | 110304ER-JS | ● | ● | – |
| | | 110308ER-JS | ● | ● | – |
| | BDMT | 11T302ER-JS | ● | ● | – |
| | | 11T304ER-JS | ● | ● | – |
| | | 11T308ER-JS | ● | ● | – |
| | BDMT | 170404ER-JS | ● | ● | – |
| | | 170408ER-JS | ● | ● | – |

Right-handed insert shown

● : Available

High-efficiency end mill

# MECH

**Notched inserts reduce chattering**
**High efficiency heavy machining with large D.O.C.**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  2-Notched | BDMT | 11T308ER-N2 | ● | ● | ● |
|  3-Notched | BDMT | 11T308ER-N3 | ● | ● | ● |
|  3-Notched | BDMT | 170408ER-N3 | ● | ● | ● |
|  4-Notched | BDMT | 170408ER-N4 | ● | ● | ● |

Right-handed insert shown

● : Available

High-efficiency end mill

# MECX

**High-efficiency machining with fine pitch styles**
**Compatible with low-rigidity facilities**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  | BDMT | 070302ER-JT | ● | ● | ● |
| | | 070304ER-JT | ● | ● | ● |
| | | 070308ER-JT | ● | ● | ● |
|  Low cutting force/ for stainless steel | BDMT | 070302ER-JS | ● | ● | – |
| | | 070304ER-JS | ● | ● | – |
| | | 070308ER-JS | ● | ● | – |

Right-handed insert shown

● : Available

# MEC

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ★ 100 – **160** – 200 | ☆ 100 – **160** – 200 | – |
| Martensitic stainless steel | – | 150 – **200** – 250 *1 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *2 | – |
| Titanium alloy (Ti -6Al -4 V) | – | 40 – **60** – 80 | 30 – **50** – 70 |

*1 CA6535: 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*2 PR1535 : 1st Recommendation fo Ni-based heat resistant alloys

# MECH

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Titanium alloy (Ti -6Al -4 V) | – | 40 – **60** – 80 | 30 – **50** – 70 |

*1 PR1535 : 1st Recommendation for Titanium alloy (Ti-6Al-4V)

Double-sided 6-edge insert, low cutting force cutter

# MFWN Mini

**MFWN's superior performance remains intact**
**Economical small diameter milling cutter**


| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | WNMU 050408EN-GM | ● | ● | ● |
|  Low cutting force | WNMU 050408EN-SM | ● | ● | ● |
|  Tough edge (for heavy cutting) | WNMU 050408EN-GH | ● | ● | ● |

●: Available

Double-sided 6-edge Insert, Low Cutting Force Cutter

# MFWN

**Economical double-sided 6-edge insert**
**Superior fracture resistance due to thick edge design**


| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  Surface finish oriented (Precision class) | WNEU 080608EN-GL | ● | ● | ● |
|  Tough edge (for heavy cutting) | WNMU 080608EN-GH | ● | ● | ● |
|  General purpose | WNMU 080604EN-GM | ● | ● | ● |
| | 080608EN-GM | ● | ● | ● |
|  Low cutting force | WNMU 080608EN-SM | ● | ● | ● |

●: Available

# MFWN Mini

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ★ 100 – **160** – 200 | ☆ 100 – **160** – 200 | – |
| Martensitic stainless steel | – | ☆ 150 – **200** – 250 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *1 | – |

*1 PR1535(Low Cutting Force) : 1st Recommendation for Ni-based heat resistant alloys

# MFWN

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ★ 100 – **160** – 200 | ☆ 100 – **160** – 200 | – |
| Martensitic stainless steel | – | ☆ 150 – **200** – 250 *1 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *2 | – |

*1 CA6535(Low Cutting Force): 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*2 PR1535 : 1st Recommendation for Ni-based heat resistant alloys

Highly efficient cutter with a 88° cutting edge angle

# MFSN88

88° cutting edge angle

**Economical inserts with 8 cutting edges. Reduces chattering with low cutting force design. Suitable for shoulder roughing**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  General purpose | SNMU | 130508EN-GM | ● | ● | ● |
|  Low cutting force | SNMU | 130508EN-SM | ● | ● | ● |
|  Tough edge (for heavy cutting) | SNMU | 130508EN-GH | ● | ● | ● |

● : Available

4-edge face mill with vertical inserts for heavy milling

# MFLN90

**Tough and reliable 4-edge vertical inserts for large D.O.C. and high feed machining. Stable heavy milling**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  Corner-R | LOGU | 221616ER-GM | ● | ● | – |
|  Corner chamfer | LOGU | 2216PAER-GM | ● | ● | – |

● : Available

# MFSN88

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon Steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy Steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | 100 – **150** – 200 | 100 – **160** – 200 *1 | – |
| Martensitic stainless steel | – | 150 – **200** – 250 *2 | – |
| Precipitation hardening stainless steel | – | ★ 90 – **120** – 150 | – |
| Gray cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *3 | – |

*1 PR1535(Low Cutting Force): 1st Recommendation for Austenitic stainless steel(SUS 304, etc.)
*2 PR1535(Low Cutting Force): 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*3 PR1535(Low Cutting Force) : 1st Recommendation for Ni-based heat resistant alloys

# MFLN90

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon Steel | ★ 120 – **150** – 180 | ☆ 80 – **120** – 150 | – |
| Alloy Steel | ★ 100 – **150** – 180 | ☆ 80 – **120** – 150 | – |
| Mold steel | ★ 80 – **120** – 150 | ☆ 70 – **100** – 120 | – |
| Gray cast iron | ★ 100 – **150** – 180 | ☆ 80 – **120** – 150 | – |
| Ductile cast iron | ★ 100 – **150** – 180 | ☆ 80 – **120** – 150 | – |

High-efficiency face mill for heavy milling

# MSRS90

**Face mill for heavy milling. Notched insert reduced cutting force when entering the workpiece**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  3-notched | SPMT 180616EN-NB3 | – | ● | ● |
|  3-notched/ Low cutting force | SPMT 180616EN-NB3P | – | ● | ● |
|  4-notched | SPMT 180616EN-NB4 | – | ● | ● |
|  4-notched/ Low cutting force | SPMT 180616EN-NB4P | – | ● | ● |
|  Without notch | SPMT 180616EN-V | – | ● | ● |

● : Available

High-efficiency face mill for heavy milling

# MSR

**High-efficiency notched inserts provide low cutting force and surppress chattering. Improves machining efficiency in heavy milling with larger depth of cut.**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  3-Notched | APMT | 250608ER-NB3 | – | ● | ● |
| | | 250616ER-NB3 | – | ● | ● |
| | | 250640ER-NB3 | – | ● | - |
| | APMT | 250616EL-NB3 | – | ● | - |
|  4-Notched | APMT | 250608ER-NB4 | – | ● | ● |
| | | 250616ER-NB4 | – | ● | ● |
| | | 250640ER-NB4 | – | ● | - |
| | APMT | 250616EL-NB4 | – | ● | - |
|  3-Notched/ Low cutting force | APMT | 250616ER-NB3P | – | ● | ● |
|  4-Notched/ Low cutting force | APMT | 250616ER-NB4P | – | ● | ● |

● : Available

# MSRS90

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon Steel | – | ★ 100 – **150** – 200 | ☆ 100 – **150** – 200 |
| Alloy Steel | – | ★ 100 – **150** – 200 | ☆ 100 – **150** – 200 |
| Mold steel | – | ★ 100 – **150** – 180 | ☆ 100 – **150** – 180 |
| Gray cast iron | – | ☆ 100 – **180** – 250 | ★ 100 – **150** – 250 |
| Ductile cast iron | – | ☆ 100 – **180** – 220 | ★ 100 – **150** – 250 |

# MSR

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon Steel | – | ★ 100 – **150** – 200 | – |
| Alloy Steel | – | – | – |
| Mold steel | – | – | – |
| Gray cast iron | – | – | ★ 100 – **150** – 200 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |

45° cutting edge angle - New general purpose cutter

# MB45

NEW

**Delivers the "low cutting force" benefits of positive inserts and the "fracture resistance" benefits of negative inserts. Excellent surface finish**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | SNMU 1406ANER-GM | ● | ● | ● |
|  Tough edge | SNMU 1406ANER-GH | ● | ● | ● |
|  General purpose | SNEU 1406ANER-GM | ● | ● | ● |
|  Low cutting force | SNEU 1406ANER-SM | ● | ● | - |

Right-handed insert shown

● : Available

45° face mill with double-sided 10-edge inserts

# MFPN45

**Reduced chattering with low cutting force design and excellent fracture resistance. Economical 10-edge insert**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | PNMU 1205ANER-GM | ● | ● | ● |
|  General purpose | PNMU 1205ANEL-GM | ● | ● | ● |
|  Low cutting force | PNMU 1205ANER-SM | ● | ● | ● |
|  Tough edge (for Heavy Cutting) | PNMU 1205ANER-GH | ● | ● | ● |
|  Surface finish oriented (Precision class) | PNEU 1205ANER-GL | ● | ● | ● |
|  Surface finish oriented (Precision class) | PNEU 1205ANEL-GL | ● | ● | ● |
|  Wiper insert (2-edge) | PNEU 1205ANER-W | ● | ● | ● |

● : Available

# MB45

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ☆ 100 – **160** – 200 | ☆ 100 – **160** – 200 *1 | – |
| Martensitic stainless steel | – | ☆ 150 – **200** – 250 *2 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | ☆ 20 – **30** – 50 *3 | – |

*1 PR1835(Low Cutting Force) : 1st Recommendation for Austenitic stainless steel(SUS 304, etc.)
*2 CA6535(Low Cutting Force) : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*3 CA6535 : 1st Recommendation fo Ni-based heat resistant alloys

# MFPN45

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ☆ 100 – **160** – 200 | ☆ 100 – **160** – 200 *1 | – |
| Martensitic stainless steel | – | ☆ 150 – **200** – 250 *2 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | ☆ 20 – **30** – 50 *3 | – |

*1 PR1535(Low Cutting Force) : 1st Recommendation for Austenitic stainless steel(SUS 304, etc.)
*2 CA6535(Low Cutting Force) : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*3 PR1535 : 1st Recommendation fo Ni-based heat resistant alloys

Highly efficient cutter with a 66° cutting edge angle

# MFPN66

66° cutting edge angle

**Economical 10-edge insert. Reduces cutting costs when machining auto parts and other general purpose machining applications**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | PNMU 0905XNER-GM | ● | ● | ● |
|  Low cutting force | PNMU 0905XNER-SM | ● | ● | ● |
|  Tough edge (for heavy cutting) | PNMU 0905XNER-GH | ● | ● | ● |

Right-handed insert shown

● : Available

High Precision and High Efficiency High Rake Cutter

# MFSE45

**Rough and finish in 1 pass with excellent surface finish**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | SEET 13T3AGSN-GL | ● | ● | – |
|  Stainless steel | SEET 13T3AGSN-SL | ● | ● | – |

● : Available

# MFPN66

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ☆ 100 – **150** – 200 | ☆ 100 – **150** – 200 *1 | – |
| Martensitic stainless steel | – | ☆ 100 – **150** – 200 *2 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | ☆ 20 – **30** – 50 *3 | – |
| Titanium alloy (Ti -6Al -4 V) | – | – | – |

*1 PR1535(Low Cutting Force) : 1st Recommendation for Austenitic stainless steel(SUS 304, etc.)
*2 PR1535(Low Cutting Force) : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*3 PR1535(Low Cutting Force) : 1st Recommendation fo Ni-based heat resistant alloys

# MFSE45

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ☆ 150 – **200** – 300 | ★ 150 – **200** – 300 | – |
| Alloy steel | ☆ 150 – **200** – 300 | ★ 150 – **200** – 300 | – |
| Mold steel | ★ 100 – **150** – 250 | ☆ 100 – **150** – 250 | – |
| Austenitic stainless steel | ☆ 100 – **200** – 250 | ★ 100 – **200** – 250 | – |
| Martensitic stainless steel | ☆ 100 – **200** – 250 | ★ 100 – **200** – 250 | – |
| Precipitation hardened stainless steel | – | – | – |
| Grey cast iron | 100 – **200** – 250 | 100 – **200** – 250 | – |
| Ductile cast iron | ☆ 100 – **200** – 250 | ☆ 100 – **200** – 250 | – |
| Ni-based heat resistant alloys | – | – | – |
| Titanium alloy (Ti -6Al -4 V) | – | – | – |

High-efficiency face mill for heavy milling

# MSRS15

75° cutting edge angle

**Large depth of cut and high feed machining provide high efficiency machining. Max. D.O.C. is 12 mm**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  2-notched | SPMT 1806EDER-NB2 | ● | ● | ● |
|  3-notched | SPMT 1806EDER-NB3 | ● | ● | ● |
|  4-notched/ Low cutting force | SPMT 1806EDER-NB2P | ● | ● | ● |
|  5-notched/ Low cutting force | SPMT 1806EDER-NB3P | ● | ● | ● |
|  2-notched/Tough edge | SPMT 1806EDSR-NB2T | – | ● | ● |
|  3-notched/Tough edge | SPMT 1806EDSR-NB3T | – | ● | ● |
|  Without notch | SPMT 1806EDER-V | ● | ● | ● |

● : Available

4-edge face mill with vertical inserts for heavy milling

# MFLN45/MFLN70

**Tough and reliable 4-edge vertical inserts for large D.O.C. and high feed machining. Stable heavy milling**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  Corner-R | LOGU 221616ER-GM | ● | ● | – |

● : Available

High efficiency multi-edge cutter for cast iron

# MFK

70° cutting edge angle

**Multi-edge cutter provides high efficiency in cast iron machining. Economical inserts with 10 cutting edges**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | PNMG 1106XNEN-GM | ● | – | ● |
|  Tough edge | PNMG 1106XNEN-GH | ● | – | ● |
|  Surface Finish Oriented | PNEG 1106XNEN-GL | ● | – | ● |
|  Wiper Insert (2-edge) | PNEG 1106XNER-W | ● | – | ● |

● : Available

# MSRS15

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ☆ 120 – **180** – 250 | ★ 120 – **180** – 220 | – |
| Alloy steel | ☆ 120 – **180** – 250 | ★ 120 – **180** – 220 | – |
| Mold steel | ☆ 100 – **160** – 220 | ★ 100 – **160** – 220 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **160** – 200 |

# MFLN45/MFLN70

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 100 – **150** – 180 | ☆ 80 – **120** – 150 | – |
| Alloy steel | ★ 100 – **150** – 180 | ☆ 80 – **120** – 150 | – |
| Mold steel | ★ 80 – **120** – 150 | ☆ 70 – **100** – 120 | – |
| Grey cast iron | ★ 100 – **150** – 180 | ☆ 80 – **120** – 150 | – |
| Ductile cast iron | ★ 100 – **150** – 180 | ☆ 80 – **120** – 150 | – |

# MFK

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Grey cast iron | ☆ 120 – **180** – 250 | – | ★ 120 – **180** – 250 |
| Ductile cast iron | ☆ 100 – **150** – 200 | – | ★ 100 – **150** – 200 |

High feed and large depth of cut milling

# MFH Boost

**High feed milling with larger depths of cut. Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials, and molds**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | LOMU 040410ER-GM | ● | ● | ● |

Right-handed insert shown

●: Available

Micro dia. cutter for high feed machining (Cutter dia. ø8 – ø16)

# MFH Micro

**Low resistance and durable against chatter for highly efficient machining. Maximum ap 0.5 mm. Stable high feed machining on a wide range of applications**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | LPGT 010210ER-GM | ● | ● | – |

Right-handed insert shown

●: Available

# MFH Boost

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **160** – 220 | ☆ 120 – **160** – 220 | – |
| Alloy steel | ★ 100 – **150** – 200 | ☆ 100 – **150** – 200 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Mold steel | ★ 60 – **100** – 130 | – | – |
| Mold steel | ★ 50 – **70** – 100 | – | – |
| Austenitic stainless steel | ☆ 100 – **140** – 180 | ★ 100 – **140** – 180 | – |
| Martensitic stainless steel | – | ☆ 100 – **150** – 200 *1 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **160** – 220 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | ☆ 20 – **30** – 50 *2 | – |
| Titanium alloy (Ti -6Al -4 V) | – | ★ 40 – **60** – 80 | – |

*1 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*2 CA6535 : 1st Recommendation fo Ni-based heat resistant alloys

# MFH Micro

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel *1 | 80 – **140** – 180 | 80 – **140** – 180 | – |
| Mold steel *1 | 60 – **100** – 130 | – | – |
| Mold steel *1 | 50 – **70** – 100 | – | – |
| Austenitic stainless steel | 100 – **160** – 200 | 100 – **160** – 200 *2 | – |
| Martensitic stainless steel | – | 150 – **200** – 250 *3 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | – |
| Ductile cast iron | – | – | – |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *4 | – |
| Titanium alloy (Ti -6Al -4 V) | – | ★ 40 – **60** – 80 | – |

*1 PR1525 : 1st Recommendation for Mold steel
*2 PR1535 : 1st Recommendation for Austenitic stainless steel (SUS 304, etc.)
*3 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*4 CA6535 : 1st Recommendation for Ni-based heat resistant alloys

Small dia. cutter for high feed machining (Cutter dia. ø16 - ø50)

# MFH Mini

**Economical inserts with 4 cutting edges. Small Dia. fine pitch type for high efficiency and high feed machining**

| Shape | Description | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
|  General purpose | LOGU 030310ER-GM | ● | ● | ● |
|  Tough edge | LOGU 030310ER-GH | ● | ● | ● |

Right-handed insert shown

●: Available

Highly efficiency and high feed cutter (Cutter dia. ø25 - ø160)

# MFH Harrier

**Wide range of products for high feed machining Large depths of cut and low cutting forces**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  General purpose | SOMT | 100420ER-GM | ● | ● | ● |
| | | 140520ER-GM | ● | ● | ● |
|  Large ap | SOMT | 100420ER-LD | ● | ● | ● |
| | | 140520ER-LD | ● | ● | ● |
|  Wiper insert | SOMT | 100420ER-FL | ● | ● | ● |
| | | 140514ER-FL | ● | ● | ● |
|  Tough edge | SOMT | 100420ER-GH | ● | ● | ● |
| | | 140520ER-GH | ● | ● | ● |

Right-handed insert shown

●: Available

# MFH Mini

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel *1 | 80 – **140** – 180 | 80 – **140** – 180 | – |
| Mold steel *1 | 60 – **100** – 130 | – | – |
| Mold steel *1 | 50 – **70** – 100 | – | – |
| Austenitic stainless steel | 100 – **160** – 200 | 100 – **160** – 200 *2 | – |
| Martensitic stainless steel | – | 150 – **200** – 250 *3 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *4 | – |
| Titanium alloy (Ti -6Al -4 V) | – | ★ 40 – **60** – 80 | ☆ 30 – **50** – 70 |

*1 PR015S : 1st Recommendation for Mold steel
*2 PR1535 : 1st Recommendation fo Austenitic stainless steel (SUS 304, etc.)
*3 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*4 CA6535 : 1st Recommendation fo Ni-based heat resistant alloys

# MFH Harrier

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel *1 | 80 – **140** – 180 | 80 – **140** – 180 | – |
| Mold steel *1 | 60 – **100** – 130 | – | – |
| Mold steel *1 | 50 – **70** – 100 | – | – |
| Austenitic stainless steel | 100 – **160** – 200 | 100 – **160** – 200 *2 | – |
| Martensitic stainless steel | – | 150 – **200** – 250 *3 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *4 | – |
| Titanium alloy (Ti -6Al -4 V) | – | ★ 40 – **60** – 80 | ☆ 30 – **50** – 70 |

*1 PR015S : 1st Recommendation for Mold steel
*2 PR1535 (LD-Large ap) : 1st Recommendation fo Austenitic stainless steel (SUS 304, etc.)
*3 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*4 CA6535 : 1st Recommendation fo Ni-based heat resistant alloys

High-efficiency radius cutter with multiple edges

# MRW

**Economical double-sided 8-edge Inserts. Excellent sharpness and cutting edge strength, suitable for a wide range of workpiece materials**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  General purpose | ROMU | 1204M0ER-GM | ● | ● | ● |
| | | 1605M0ER-GM | ● | ● | ● |
|  Low cutting force | ROMU | 1204M0ER-SM | ● | ● | – |
| | | 1605M0ER-SM | ● | ● | – |
|  Tough edge (for heavy milling) | ROMU | 1204M0ER-GH | ● | ● | ● |
| | | 1605M0ER-GH | ● | ● | ● |

Right-handed insert shown

●: Available

Low-cutting-force and high-efficiency radius cutter

# MRX

**Excellent cutting performance due to low cutting force design High-efficiency radius cutter**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  General purpose | RDGT | 0803M0ER-GM | ● | ● | ● |
| | RPGT | 10T3M0ER-GM | ● | ● | ● |
| | | 1204M0ER-GM | ● | ● | ● |
| | | 1605M0ER-GM | ● | ● | ● |
|  General purpose | RDMT | 0803M0ER-GM | ● | ● | ● |
| | RPMT | 10T3M0ER-GM | ● | ● | ● |
| | | 1204M0ER-GM | ● | ● | ● |
| | | 1605M0ER-GM | ● | ● | ● |
|  Low cutting force | RDGT | 0803M0ER-SM | ● | ● | – |
| | RPGT | 10T3M0ER-SM | ● | ● | – |
| | | 1204M0ER-SM | ● | ● | – |
| | | 1605M0ER-SM | ● | ● | – |
|  Tough edge (for heavy cutting) | RDMT | 0803M0EN-GH | ● | ● | ● |
| | RPMT | 10T3M0EN-GH | ● | ● | ● |
| | | 1204M0EN-GH | ● | ● | ● |
| | | 1605M0EN-GH | ● | ● | ● |

Right-handed insert shown

●: Available

# MRW

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ☆ 100 – **160** – 200 | ★ 100 – **160** – 200 | – |
| Martensitic stainless steel | – | 150 – **200** – 250 *1 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *2 | – |
| Titanium alloy (Ti -6Al -4 V) | – | ☆ 40 – **60** – 80 | ☆ 30 – **50** – 70 |

*1 CA6535 : 1st Recommendation for Martensitic stainless steel ( SUS 403, etc. )
*2 PR1535 : 1st Recommendation fo Ni-based heat resistant alloys

# MRX

## Recommended cutting conditions (GM – General purpose)

★1st recommendation ☆2nd recommendation

| Workpiece material | Recommended insert grade (Vc: m/min) | | |
|---|---|---|---|
| | PR1825 | PR1835 | PR1810 |
| Carbon steel | ★ 120 – **180** – 250 | ☆ 120 – **180** – 250 | – |
| Alloy steel | ★ 100 – **160** – 220 | ☆ 100 – **160** – 220 | – |
| Mold steel | ★ 80 – **140** – 180 | ☆ 80 – **140** – 180 | – |
| Austenitic stainless steel | ☆ 100 – **160** – 200 | ★ 100 – **160** – 200 | – |
| Martensitic stainless steel | – | 150 – **200** – 250 *1 | – |
| Precipitation hardened stainless steel | – | ★ 90 – **120** – 150 | – |
| Grey cast iron | – | – | ★ 120 – **180** – 250 |
| Ductile cast iron | – | – | ★ 100 – **150** – 200 |
| Ni-based heat resistant alloys | – | 20 – **30** – 50 *2 | – |
| Titanium alloy (Ti -6Al -4 V) | – | ★ 40 – **60** – 80 *3 | ☆ 30 – **50** – 70 |

*1 CA6535 : 1st Recommendation for Martensitic stainless steel(SUS 403, etc.)
*2 CA6535 : 1st Recommendation for Ni-based heat resistant alloys

## Other inserts for milling

Multi-function end mill

# MEY

**Multi-function machining (Drilling/Ramping/Shouldering/ Grooving). Full 2-insert structure and high stability**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  | GOMT | 08T208ER-D | ● | – | ● |
| | | 100308ER-D | ● | – | ● |
| | | 13T308ER-D | ● | – | ● |
| | | 160408ER-D | ● | – | ● |
|  | JOMT | 08T208ER-D | ● | – | ● |
| | | 100308ER-D | ● | – | ● |
| | | 13T308ER-D | ● | – | ● |
| | | 160408ER-D | ● | – | ● |

● : Available

Chamfering end mill

# MCSE

**For 30˚, 45˚, 60˚ chamfering. Economical 4-edge insert**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  | SDKW | 09T204TN | ● | – | – |
| | SEKW | 120304TN | ● | – | – |
| | | 120308TN | ● | – | – |
|  Low cutting force | SDMT | 09T204C | ● | – | – |
| | SEMT | 120304C | ● | – | – |

● : Available

Bolt countersink end mill

# MEF

**Countersink for hexagon socket bolt (M6 ~ M30). Economical 4-edge insert**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  | SPMT | 060204E-Z | ● | – | ● |
| | | 060208E-Z | ● | – | ● |
| | | 090304E-Z | ● | – | ● |
| | | 090308E-Z | ● | – | ● |

● : Available

T-Slot mill

# METS

**For T-slotting. Recommended for high feed machining with 2 flute design. Economical 4-edge insert**

| Shape | Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|---|
| | | | PR1825 | PR1835 | PR1810 |
|  | SDMT | 060304E-K | – | ● | ● |
| | | 080308E-K | – | ● | ● |
| | | 120408E-K | – | ● | ● |

● : Available

# ISO standard inserts for milling

| Description | | MEGACOAT NANO EX | | |
|---|---|---|---|---|
| | | PR1825 | PR1835 | PR1810 |
| SDMR | 1203AUER-H | ● | – | – |
| SEMR | 1203AFER-H | ● | – | – |
| SPEN | 1203EESR | – | – | ● |
| SPMR | 1203EDER-H | ● | – | – |
| TEMR | 1603PTER-H | ● | – | – |
| TEMR | 2204PTER-H | ● | – | – |
| TPMR | 1603PDER-H | ● | – | – |
| TPMR | 2204PDER-H | ● | – | – |
| RDHX | 0702M0T | – | ● | – |
| RDHX | 1003M0T | – | ● | – |
| RDHX | 12T3M0T | – | ● | – |
| RDMT | 08T2M0-H | – | ● | ● |
| RPMT | 10T3M0 | – | ● | ● |
| RPMT | 1204M0 | – | ● | ● |
| RPMT | 1204M0-H | – | ● | ● |
| RPMT | 1606M0-H | – | ● | ● |
| RPMT | 2006M0-H | – | ● | ● |
| SDMT | 1204AESR-H | ● | – | – |

● : Available