



PR18 Series

Next-Generation PVD Coating for Milling



Longer Tool Life with Next-generation Coating for Milling

Exceptional tool life with
MEGACOAT NANO EX coating technology



3 new grades for 16 different milling series

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

Features 3 grades: PR1825/PR1835/PR1810 Available for various machining environments



Double lamination technology

Special Nano Layer + Multi-layer Lamination



AlTi-based
special nano layer



AlCr-based
special nano layer

CG Image

Kyocera's New Nano Layer Coating Technology

Longer Tool Life with Next-generation Coating for 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

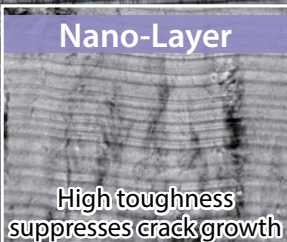
Special Nano Layer x Multi-layer Lamination

Nano-Layer



AlCr-based coating
with excellent abrasion resistance

Nano-Layer

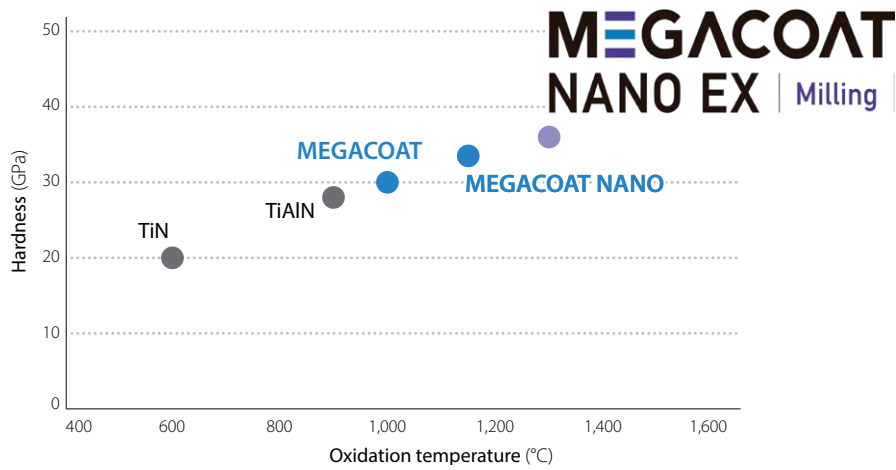


AlTi-based coating
with excellent heat resistance

Multi-layering of high-performance nano layers

Increases toughness with the suppression of crack growth and optimization of internal stress

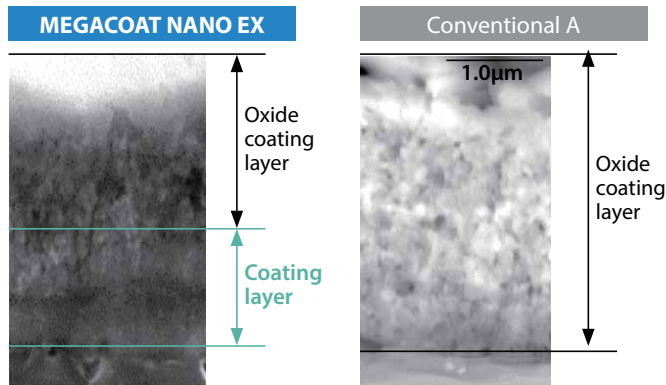
CG Image



Excellent oxidation resistance

Oxidation progression comparison (Internal evaluation)

Suppresses oxidation progression with excellent oxidation resistance

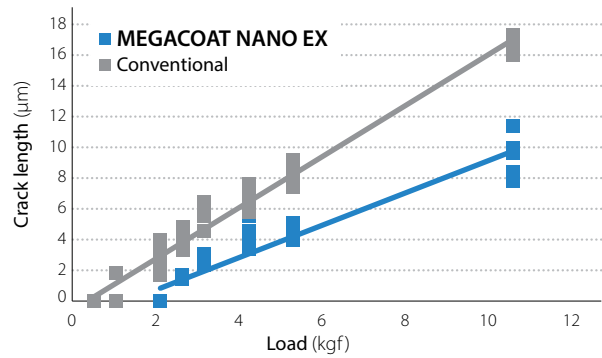
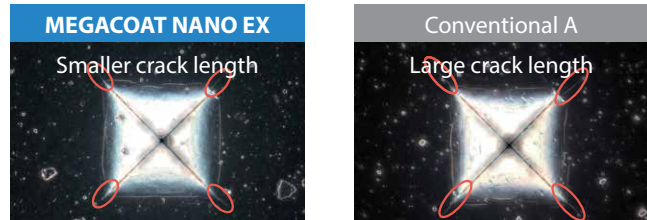


*Section after holding at 1,200 degrees for 30 minutes in air

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.

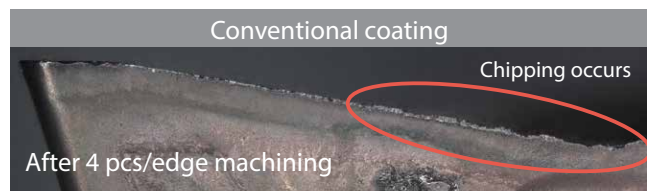
Guides 1049

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 = 660 sfm, D.O.C. = 0.079", fz = 0.005 ipt, Dry BDMT170408ER-JT (PR1825) MEC ø1.00" (2 flutes)

(User evaluation)

2

Compatible with various machining applications

PR1825

P

for Steel (Wear resistance oriented)

PR1835

M

for Steel (Stability oriented)
for Stainless Steel (1st recommendation)

PR1810

K

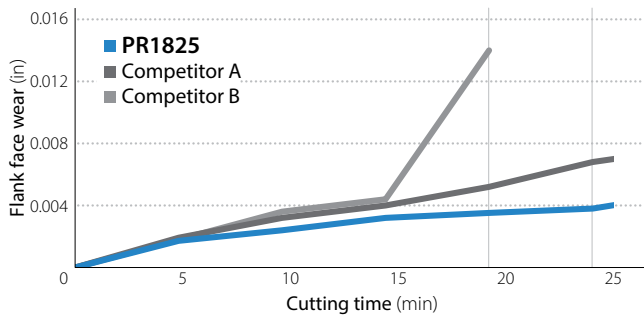
for Cast Iron

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					1st recommendation					1st recommendation				
	PR1825					PR1835					PR1810				
	Stability oriented														
	PR1835														

PR1825

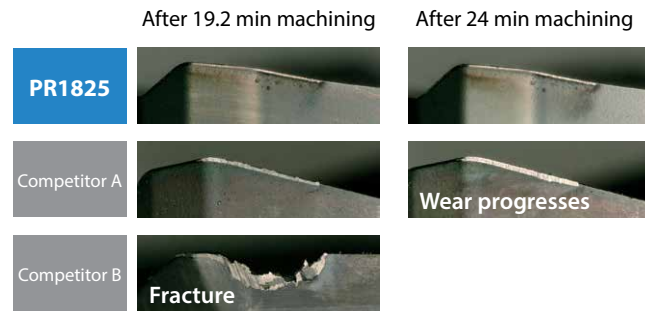
Carbide base material with an excellent balance of hardness, toughness and versatility

Wear resistance comparison (Internal evaluation)



Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.079" x 2.559", fz = 0.005 ipt, D2, Dry PNMU1205ANER-GM (MFPN45)

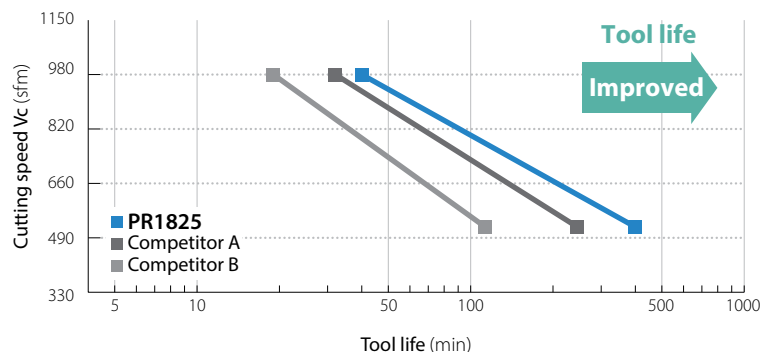
Edge condition



V-T graph (Internal evaluation)

Life criteria :
Flank face wear = 0.004"

Cutting Conditions :
Vc = 520 / 980 sfm
D.O.C. x ae = 0.079" x 4.331",
fz = 0.005 ipt, 4140, Dry
PNMU1205ANER-GM (MFPN45)





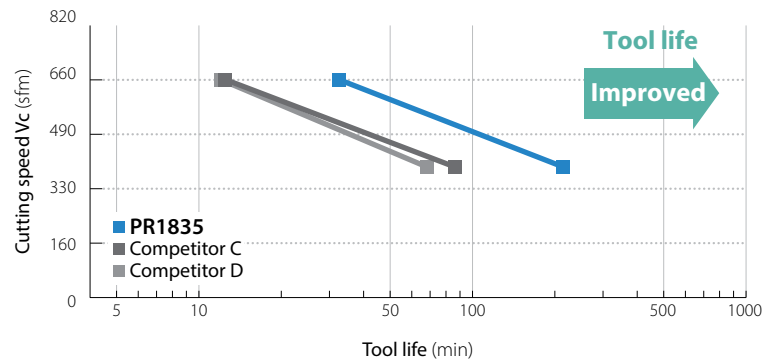
PR1835

Carbide base material with superior impact resistance and stability
Optimized particle shape and structure homogenization improves toughness of base material

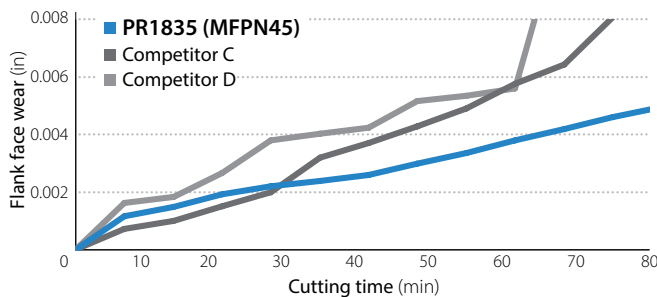
V-T graph (Internal evaluation)

Life criteria :
Flank face wear = 0.004"

Cutting Conditions :
Vc = **390 / 660** sfm
D.O.C. x ae = 0.079" x 4.331", fz = 0.005 ipt
304 Dry
PNMU1205ANER-SM (MFPN45)

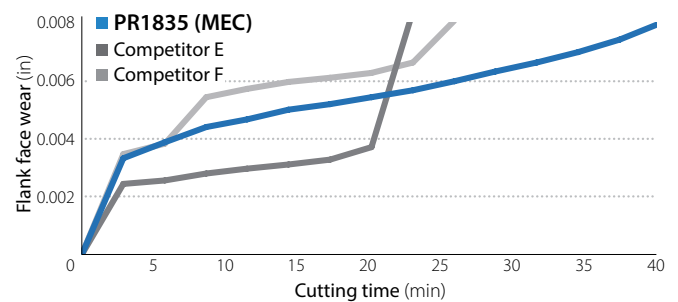


Wear resistance comparison (Internal evaluation)



Cutting Conditions: Vc = 490 sfm, D.O.C. x ae = 0.079" x 3.150", fz = 0.004 ipt
304, Dry PNMU1205ANER-SM

Wear resistance comparison (Internal evaluation)

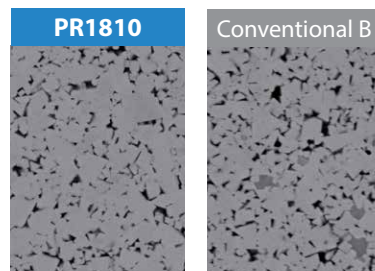


Cutting Conditions : Vc = 390 sfm, D.O.C. x ae = 0.079" x 0.591", fz = 0.004 ipt
304, Dry BDMT11T308ER-JS

PR1810

Uses a proprietary base material with excellent thermal conductivity for stable machining of cast iron

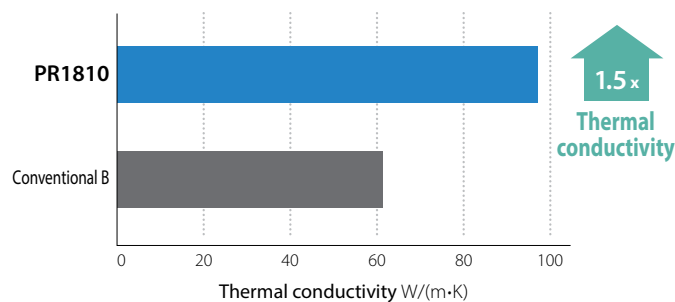
Carbide Substrate



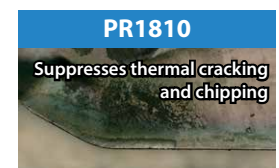
Coarse fine granules

Fine grain

Thermal conductivity comparison (Internal evaluation)



Cutting edge condition
(Internal evaluation)
After about 60 min machining



Cutting Conditions :
Vc = 660 sfm
D.O.C. x ae = 0.079" x 3.347"
fz = 0.008 ipt
65-45-12, Wet
PNMU1205ANER-GM (MFPN45)

PR1810 uses a mixture of coarse and fine grains for improved thermal conductivity and reduced thermal cracking and chipping

Product Lineup

PR18 series for various applications

90°/88° Cutting Edge Angle P10

Tangential 90° Milling with 4-Edge Inserts
MA90

NEW



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



90° End Mill with Double Sided 4-edge Inserts
MEW



High-Efficiency End Mill
MEC



High-Efficiency Helical End Mill
MECH



High-Efficiency and Low Cutting Force End Mill
MECX



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



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



Highly Efficient Cutter with a 88° Cutting Edge Angle
MFSN88



45°/66° Cutting Edge Angle P13

New 45° General Purpose Milling
MB45

NEW



Delivers low cutting force benefits of positive inserts and fracture
resistance benefits of negative inserts with excellent surface finish



45° Face Mill with Double-sided 10-edge Inserts
MFPN45



Highly Efficient Cutter with a 66° Cutting Edge Angle
MFPN66



High Feed Cutter P14

High Efficiency and High Feed Cutter
MFH Series

High Feed and Large Depth of Cut Milling
MFH-MAX



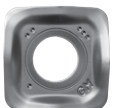
Micro Dia. Cutter for High Feed Machining
MFH-MICRO



Small Dia. Cutter for High Feed Machining
MFH-MINI



High Efficiency, General Purpose High Feed Cutter
MFH-RAPTOR



Radius Cutter P15

Low-Cutting-Force and High-Efficiency Radius Cutter
MRX



Up to 2.5 times longer tool life than conventional tools
Delivers excellent performance with a wide variety of cutters



Case Studies

Mechanical parts 1045

Vc = 520 sfm
D.O.C. = 0.039"
fz = 0.006 ipt
Wet
MA90-25S20-09T3C
LOGU090408ER-GM

MA90



Number of parts

PR1825

15 pcs/edge

2.5x

Tool life

Conventional C 6 pcs/edge

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 S31600

MB45



Vc = 300 sfm
D.O.C. = 0.079"
fz = 0.007 ipt
Dry
MB45-063R-14T5C-M
SNMU1406ANER-GM

Number of parts

PR1825

30 pcs/edge

1.6x

Tool life

Conventional D 18 pcs/edge

Unique low cutting force wiper edge design reduces chattering

Shows 1.6x longer tool life

(User evaluation)

General machine parts 65-45-12

Vc = 390 sfm
D.O.C. = 0.039"
fz = 0.008 ipt
Dry
MFWN90080R-S32-5T
WNMU080608EN-GM

MFWN



Number of parts

PR1825

65 pcs/edge

1.6x

Tool life

Conventional E 40 pcs/edge

Shows stable machining without insert fracture

Shows 1.6x longer tool life

(User evaluation)

Mechanical parts SCM420

MECH



Vc = 430 sfm
D.O.C. = 0.512"
fz = 0.003 ipt
Wet
MECH025-S25-11-4-2T
BDMT11T308ER-N2/N3

Number of parts

PR1825

6 pcs/edge

1.5x

Tool life

(Cutting distance : 125 ft)

Conventional F 4 pcs/edge

(Cutting distance : 83 ft)

Good cutting edge condition in heavy machining with large D.O.C.

1.5x longer tool life

(User evaluation)

Mold parts Plastic mold steel

Vc = 390 sfm
D.O.C. = 0.012"
fz = 0.051 ipt
Wet
MFH25-S25-03-5T
LOGU030310ER-GM

MFH Mini



Number of parts

PR1835

150 pcs/edge

2.5x

Tool life

Conventional G 60 pcs/edge

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 No. 45

MFPN45



Vc = 1180 sfm
D.O.C. = 0.014"
fz = 0.003 ipt
Wet
MFPN45100R-8T
PNMU1205ANER-GH

Number of parts

PR1810

200 pcs/edge

2x

Tool life

Conventional H 100 pcs/edge

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

(User evaluation)

90° Cutting Edge Angle

Tangential 90° Milling with 4-Edge Inserts

MA90

NEW

Original tangential 90° milling design
with economical 4-edge inserts









90° Milling with Double Sided 4-edge Inserts

MEW




Reduces cutting force equivalent to positive inserts
Excellent surface finish



Shape	Part Number	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

● : Standard Item

Shape	Part Number	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	●	●	●
 Low Cutting Force	LOMU 100408ER-SM	●	●	●
	LOMU 150508ER-SM	●	●	●
 Tough Edge (for Heavy Cutting)	LOMU 100408ER-GH	●	●	●
	LOMU 150508ER-GH	●	●	●

Right-Handed Insert Shown

● : Standard Item



90° Cutting Edge Angle

High-Efficiency Milling

MEC

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



Shape	Part Number	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	●	●	●
	BDMT 110302ER-JS	●	●	-
	110304ER-JS	●	●	-
	110308ER-JS	●	●	-
	BDMT 11T302ER-JS	●	●	-
	11T304ER-JS	●	●	-
	11T308ER-JS	●	●	-
	BDMT 170404ER-JS	●	●	-
	170408ER-JS	●	●	-
	Low Cutting Force/ for Stainless Steel			

Right-Handed Insert Shown





● : Standard Item

High-Efficiency Helical End Mill

MECH

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



Shape	Part Number	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

● : Standard Item

High-Efficiency End Mill

MECX

High-efficiency machining with fine pitch styles
Compatible with low-rigidity machining setups

Shape	Part Number	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

● : Standard Item




90°/88° Cutting Edge Angle

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

MFWN Mini

Economical double-sided 6-edge insert
Economical small diameter milling cutter



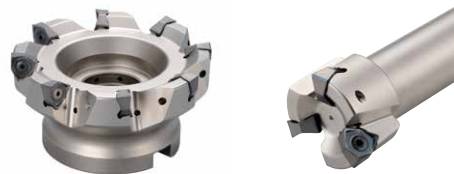
Shape	Part Number	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General Purpose	WNMU 050408EN-GM	●	●	●
 Low Cutting Force	WNMU 050408EN-SM	●	●	●
 Tough Edge (for Heavy Cutting)	WNMU 050408EN-GH	●	●	●





● : Standard Item

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

MFWN

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



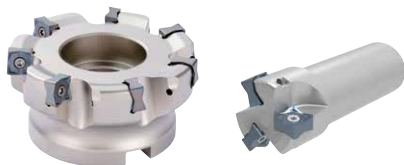
Shape	Part Number	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 Surface Finish Oriented (Precision Class)	WNEU 080608EN-GL	●	●	●
 Tough Edge (for Heavy Cutting)	WNMU 080608EN-GH	●	●	●
 General Purpose	WNMU 080604EN-GM	●	●	●
	080608EN-GM	●	●	●
 Low Cutting Force	WNMU 080608EN-SM	●	●	●




● : Standard Item

Highly Efficient Cutter with an 88° Cutting Edge Angle

MFSN88

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



Shape	Part Number	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	●	●	●

● : Standard Item

45°/66° Cutting Edge Angle





45° Cutting Edge Angle - New General Purpose Cutter

MB45

NEW

Delivers low cutting force benefits of positive inserts and fracture resistance benefits of negative inserts with excellent surface finish



Shape	Part Number	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




● : Standard Item

Highly Efficient Cutter with a 66° Cutting Edge Angle

MFPN66

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



Shape	Part Number	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








● : Standard Item

45° Face Mill with Double-sided 10-edge Inserts

MFPN45

Reduced chattering with low cutting force design, excellent fracture resistance, and economical 10-edge inserts



Shape	Part Number	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	●	●	●

● : Standard Item


High Feed Cutters

High Feed and Large Depth of Cut Milling
($\phi 1.000'' - \phi 3.000''$ | $\phi 22\text{mm} - \phi 80\text{mm}$)

MFH-MAX

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	Part Number	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General Purpose	LOMU 040410ER-GM	●	●	●

Right-Handed Insert Shown


● : Standard Item

Micro Dia. Cutter for High Feed Machining
($\phi 0.375'' - \phi 0.625''$ | $\phi 8\text{mm} - \phi 16\text{mm}$)

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	Part Number	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General Purpose	LPGT 010210ER-GM	●	●	-

Right-Handed Insert Shown



● : Standard Item

Small Dia. Cutter for High Feed Machining
($\phi 0.625'' - \phi 2.000''$ | $\phi 16\text{mm} - \phi 50\text{mm}$)

MFH-MINI

Small Dia. and economical inserts with 4 cutting edges for high efficiency and high feed machining



Shape	Part Number	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General Purpose	LOGU 030310ER-GM	●	●	●
 Tough Edge	LOGU 030310ER-GH	●	●	●

Right-Handed Insert Shown

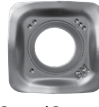
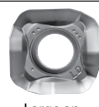
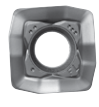

● : Standard Item

Highly Efficiency and High Feed Cutter
($\phi 1.000'' - \phi 6.000''$ | $\phi 25\text{mm} - \phi 160\text{mm}$)

MFH-RAPTOR

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



Shape	Part Number	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

● : Standard Item





Radius Cutter

Low-Cutting-Force and High-Efficiency Radius Cutter

MRX

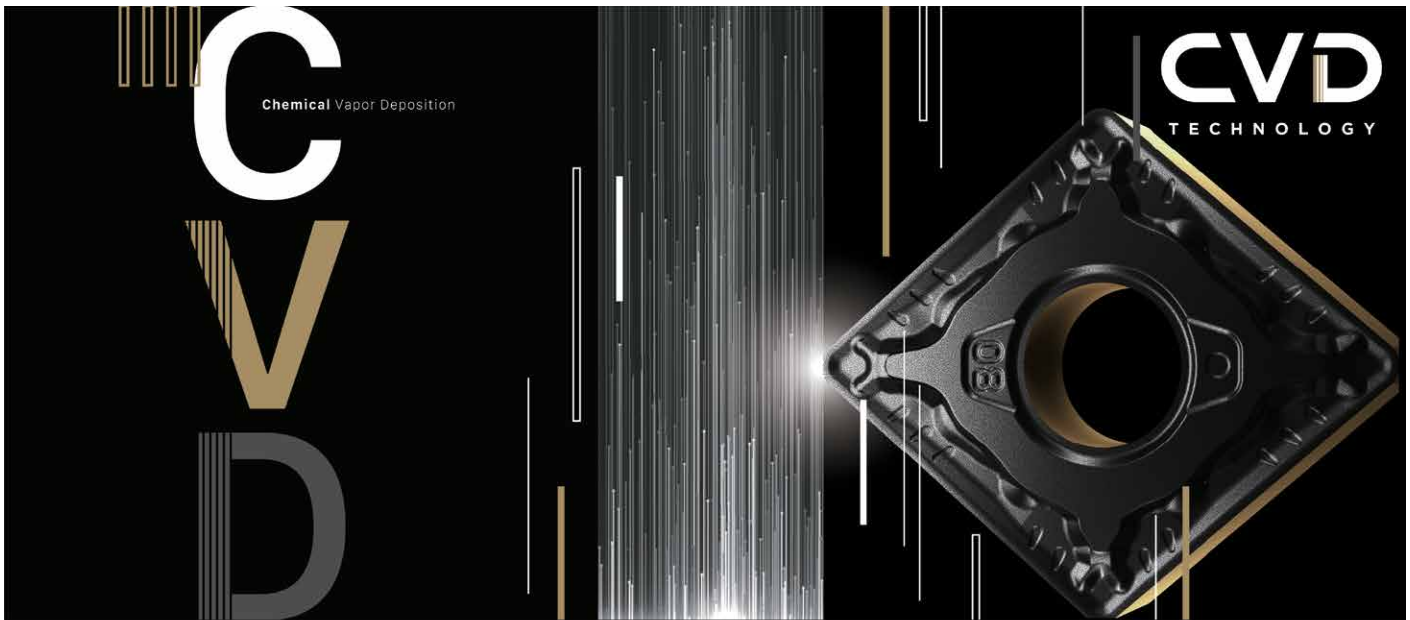
Excellent cutting performance due to low cutting force design
High-efficiency radius cutter



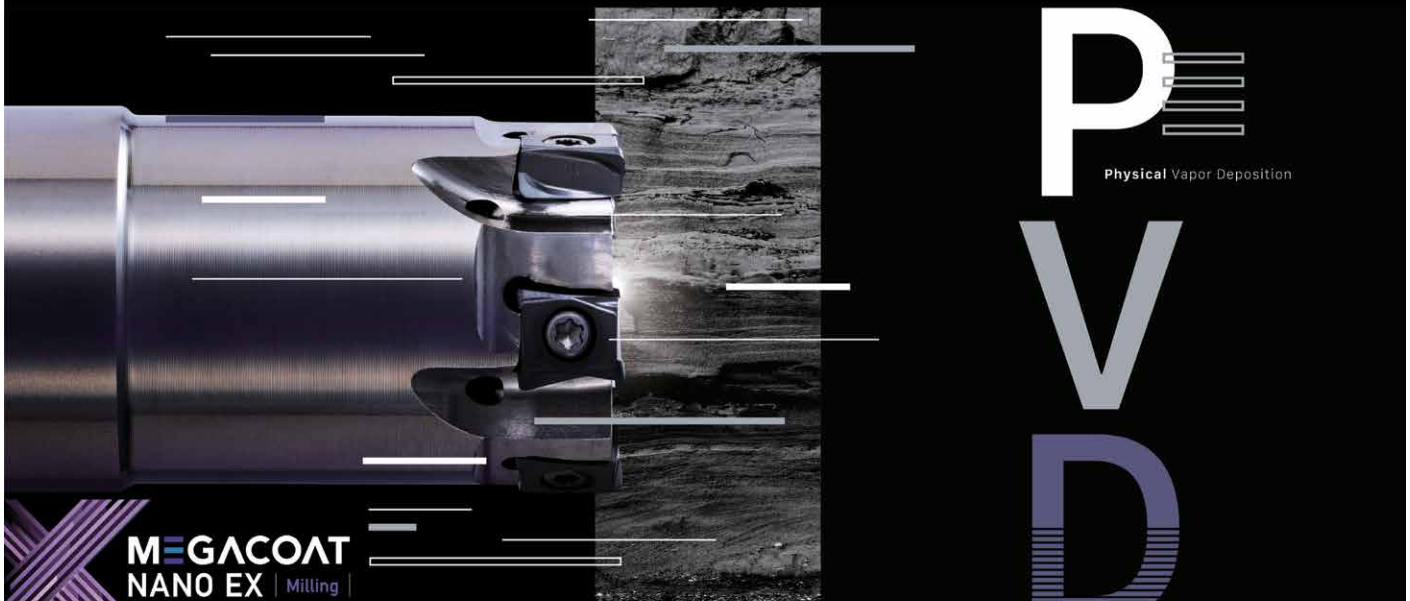
Shape	Part Number	MEGACOAT NANO EX		
		PR1825	PR1835	PR1810
 General Purpose	RDGT 0803M0ER-GM	●	●	●
	RPGT 10T3M0ER-GM	●	●	●
	1204M0ER-GM	●	●	●
	1605M0ER-GM	●	●	●
 General Purpose	RDMT 0803M0ER-GM	●	●	●
	RPMT 10T3M0ER-GM	●	●	●
	1204M0ER-GM	●	●	●
	1605M0ER-GM	●	●	●
 Low Cutting Force	RDGT 0803M0ER-SM	●	●	-
	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

● : Standard Item



Achieving Unprecedented Tool Life



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