Tooling News No.552

SUMITOMO

CARBIDE - CBN - DIAMOND

Global Support, Global Solutions.

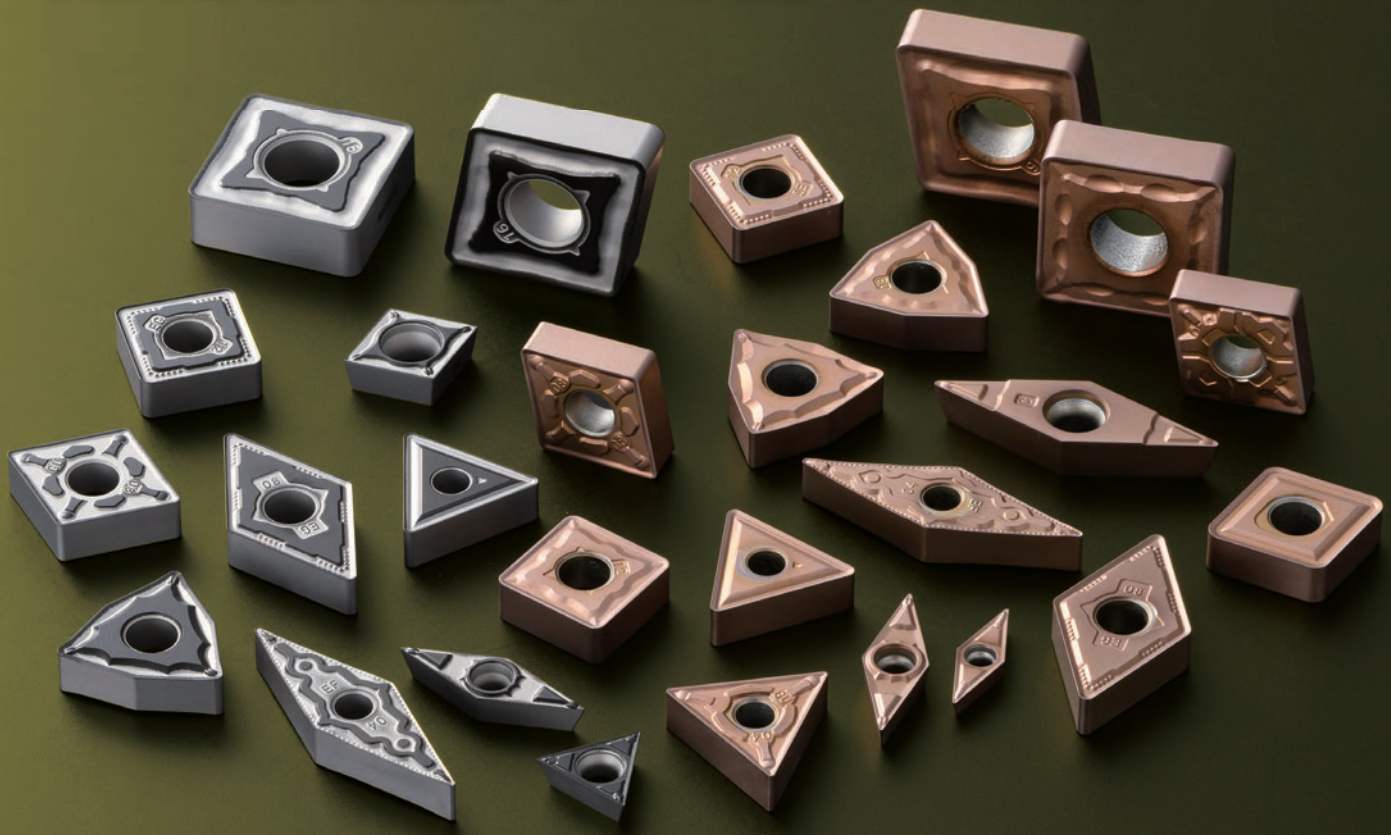
Coated Grades for Stainless Steel

AC6020M/AC6030M/AC6135M/AC6145M

Stainless steel turning grade series, achieving "ABSOLUTELY STABLE CUTTING"

2016-029 JTA ECO PRODUCT (AC6020M)

2015-009 JTA ECO PRODUCT (AC6030M)



New General Interruption/Mill-scale Turning, Heavy Interrupted Turning

Introducing AC6135M/AC6145M

New Negative M Class Chipbreaker

EH type Lineup

for Medium Cutting to Roughing

Stocked Grades: AC6135M/AC6145M

P M K N S H

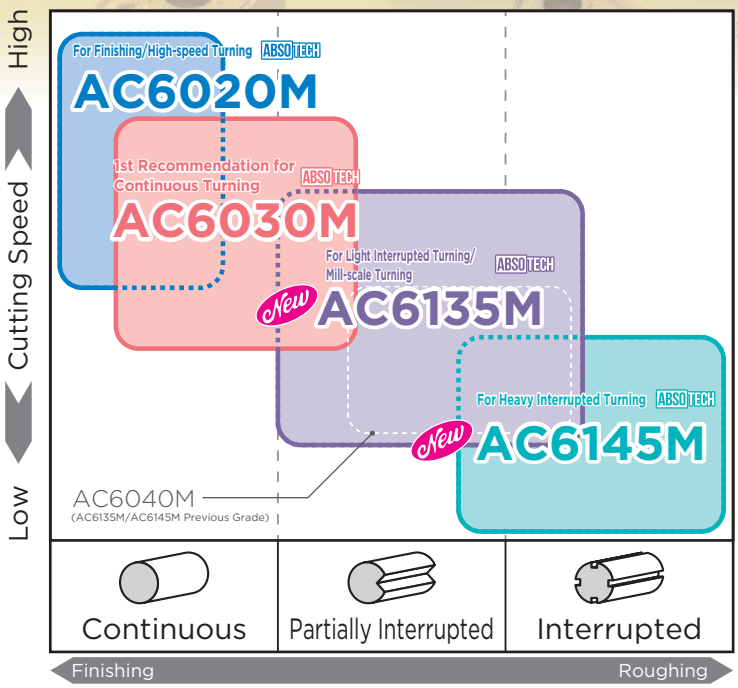
SUMITOMO ELECTRIC GROUP

Coated Grades For Stainless Steel

AC6020M/AC6030M/AC6135M/AC6145M

VIDEO OF CUTTING

■ Application Range



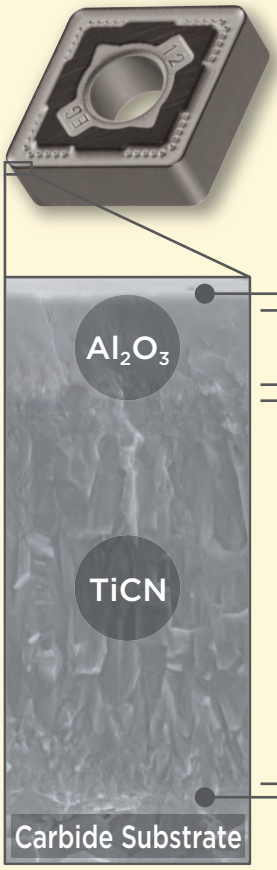
AC6020M CVD ABSOTECH
The combination of a CVD coating and a high-hardness carbide substrate realises long and stable tool life in **finishing and high-speed turning**

AC6030M CVD ABSOTECH
1st recommended grade for continuous turning, using CVD coating to drastically reduce the occurrence of abnormal damage, a problem in stainless steel turning, to achieve a long and stable tool life.

AC6135M New PVD ABSOTECH
Balances excellent wear resistance and fracture resistance in **light interrupted turning and mill-scale turning** through the use of new PVD coating

AC6145M New PVD ABSOTECH
The combination of a PVD coating and a high-toughness carbide substrate realises absolute stability in **heavy interrupted turning**

■ Features of AC6020M/AC6030M



AC6020M / AC6030M CVD ABSOTECH

Stainless steel turning grades with significantly improved chipping and adhesion resistance through the use of our proprietary insert surface smoothing treatment

Surface Smoothing Treatment
Surface smoothing treatment improves adhesion resistance, significantly suppressing adhesion and the resulting chipping

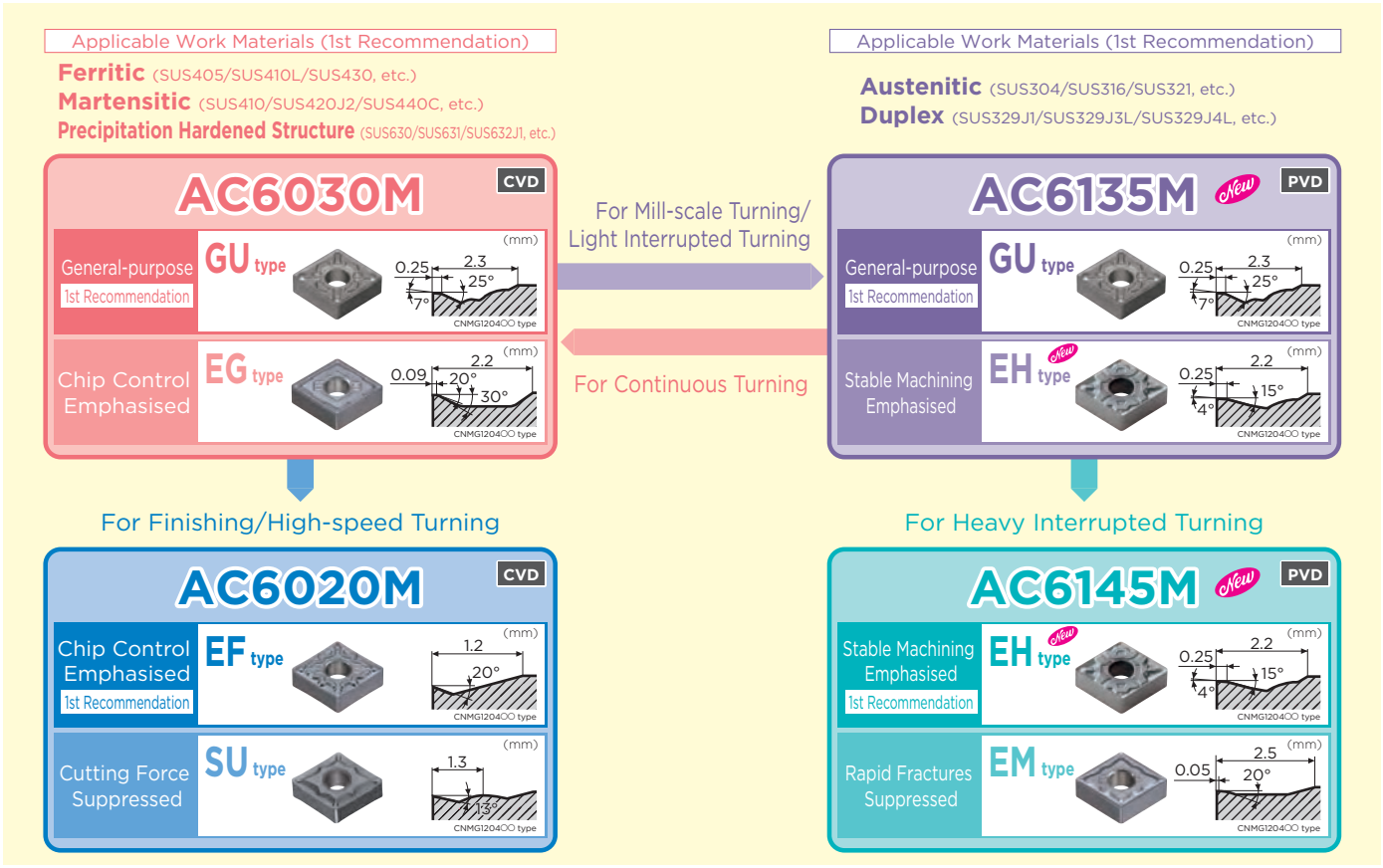
High Toughness Alumina Layer
Realises stable long tool life through the use of an alumina layer with excellent toughness

High Hardness Fine Grained TiCN Layer
Fine and uniform crystal structure significantly improves the coating hardness

High Adhesion Technology
Significantly improves adhesion strength through a smooth interface between the coating and carbide substrate

AC6020M/AC6030M/AC6135M/AC6145M

■ Applications of AC6000M Series / AC6100M Series (Example: Stainless Steel)



■ Features of AC6135M/AC6145M New

AC6135M / AC6145M PVD ABSOTECH

TiAlBCN-based multi-layered coating provides excellent wear, fracture and adhesion resistance and exhibits absolute stability in the turning of stainless steels

Adhesion Resistance Layer

The use of a TiCN-based composition with excellent lubricity suppresses adhesion and the resulting chipping

Wear Resistance Layer

The use of our proprietary high-hardness TiAlBN-based super multi-layered coating significantly suppresses crater wear and flank wear

Chipping Resistance Layer

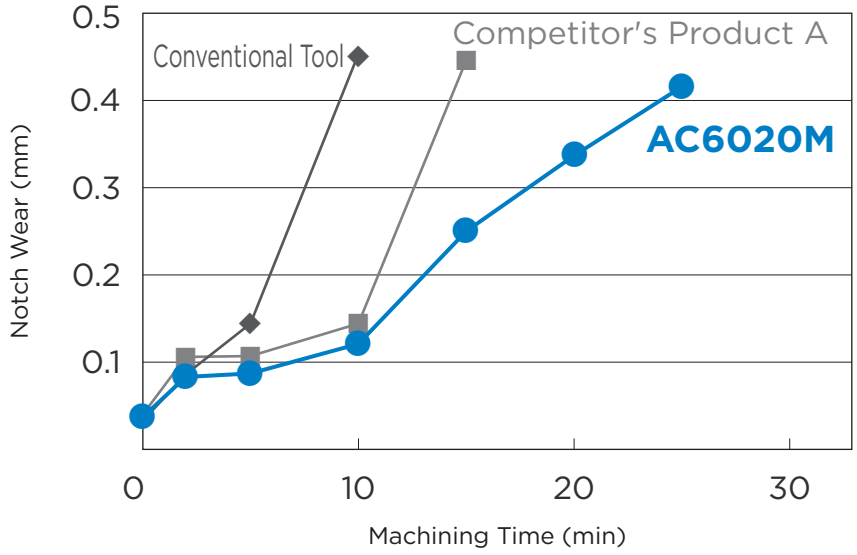
The use of an ultra-fine grain TiAlBN-based composition with excellent toughness suppresses unexpected chipping

High Adhesion Technology

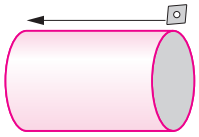
Improved stability with special technology enhancing coating adhesion strength

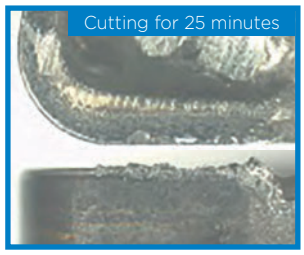
AC6020M/AC6030M/AC6135M/AC6145M

■ Wear Resistance of AC6020M (Continuous Turning of Stainless Steel)

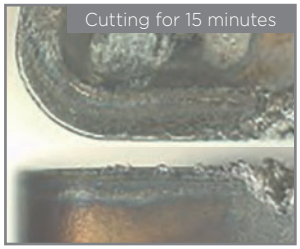


Work Material: SUS316L
Continuous Turning
Insert: CNMG120408
Cutting Conditions: vc = 150m/min
f = 0.3mm/rev
ap = 2.0mm
Wet



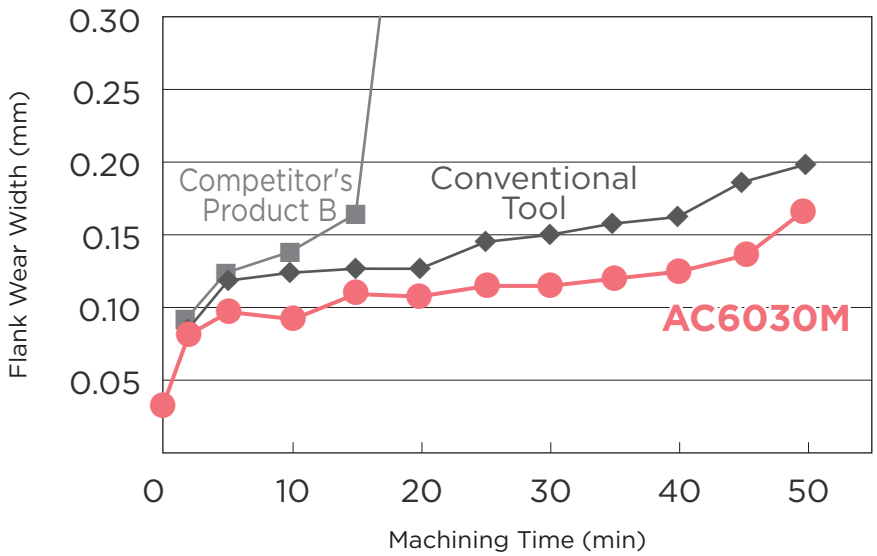


AC6020M

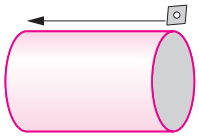


Competitor's Product A

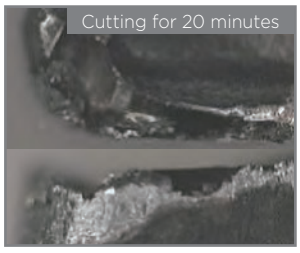
■ Wear Resistance of AC6030M (Continuous Turning of Stainless Steel)



Work Material: SUS316
Continuous Turning
Insert: CNMG120408
Cutting Conditions: vc = 200m/min
f = 0.2mm/rev
ap = 2.0mm
Wet



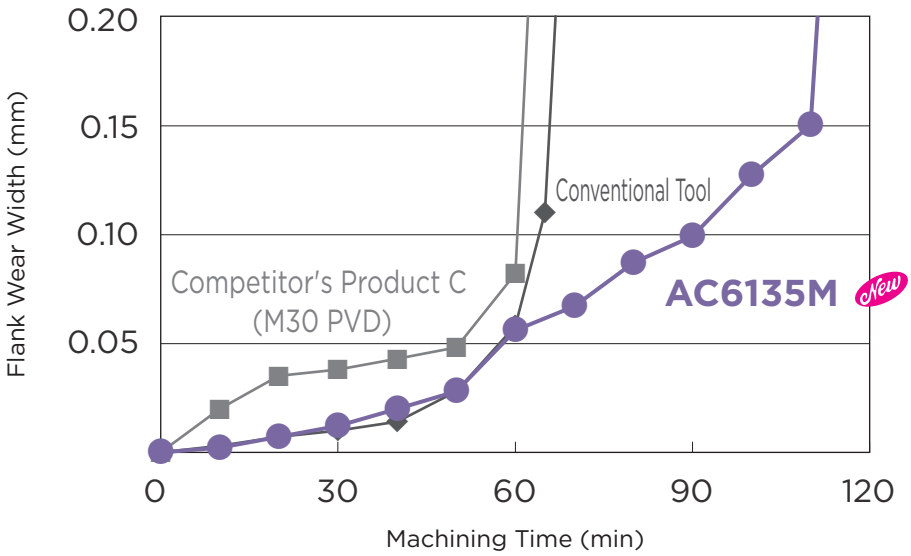
AC6030M



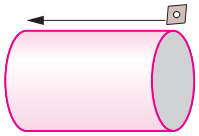
Competitor's Product B

AC6020M/AC6030M/AC6135M/AC6145M

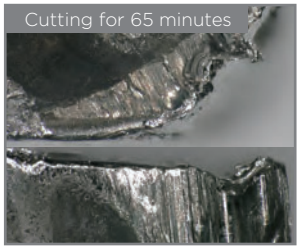
■ Wear Resistance of AC6135M (Continuous Turning of Stainless Steel)



Work Material: SUS316
Continuous Turning
Insert: CNMG120408
Cutting Conditions: vc = 150m/min
f = 0.2mm/rev
ap = 2.0mm
Wet

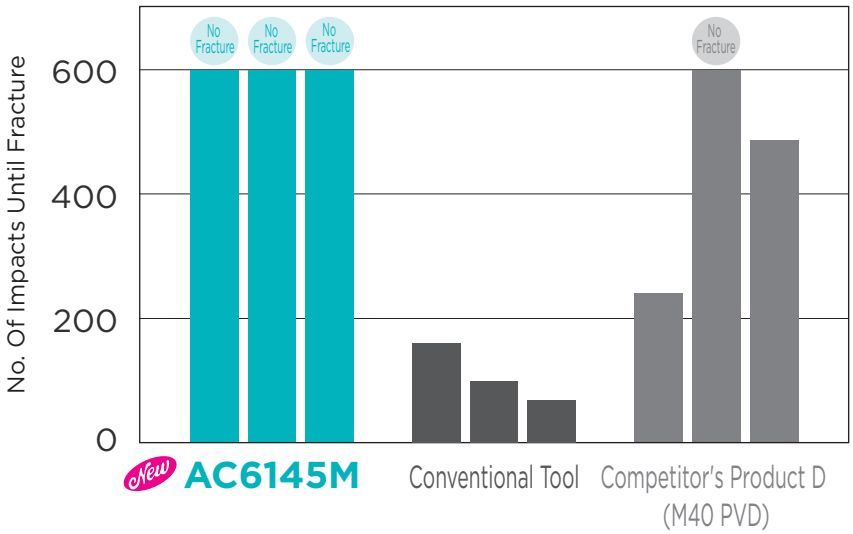


New AC6135M

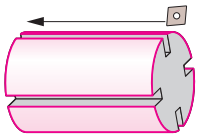


Competitor's Product C
(M30 PVD)

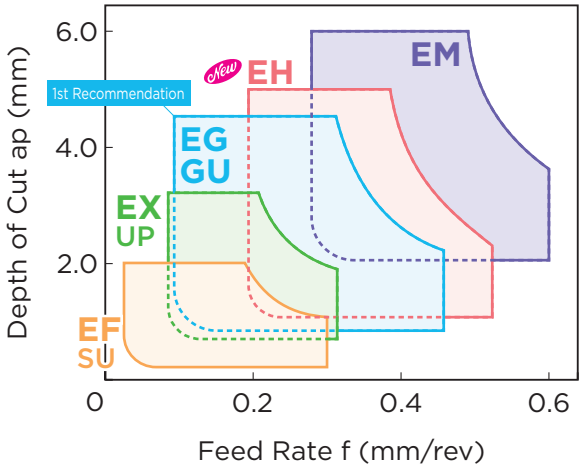
■ Fracture Resistance of AC6145M (Interrupted Turning of Stainless Steel)



Work Material: SUS316
Interrupted Turning
Insert: CNMG120408
Cutting Conditions: vc = 70m/min
f = 0.25mm/rev
ap = 1.0mm
Wet



■ Chipbreaker Application Range

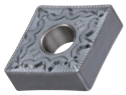


Chipbreaker series for stainless steel turning includes EF type for finishing, EX type for finishing to medium cutting, EG and GU types for medium cutting, and EM type for roughing In addition, EH type for medium cutting to roughing and interrupted applications is also available

The entire series meets various needs such as chip control performance, wear resistance performance, fracture resistance performance and so on, realising stability in stainless steel turning

■ Features of Chipbreakers

EF type — For Finishing



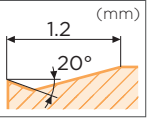
Main chipbreaker exhibits excellent chip evacuation performance even with small depths of cut

Cutting edge designed with an emphasis on sharpness (20° rake angle) to suppress wear

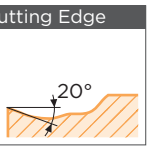
Grooved rake face suppresses heat generation and uneven contact

Chipbreaker Cross Section (CNMG120400 type)

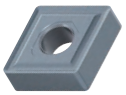
Corner Part



Cutting Edge



EX type — For Light to Medium Cutting

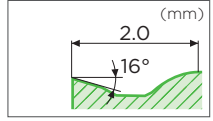


Curve-faced chipbreaker reduces contact with chips to decrease heat generation and cutting load

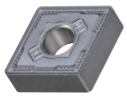
Straight cutting edge and large rake angle (16°) improve cutting edge sharpness and notch damage resistance performance

Chipbreaker Cross Section (CNMG120400 type)

Cutting Edge (Standard)



EG type — For Medium Cutting

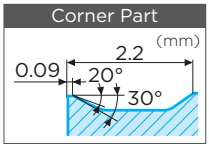


Spherical protrusions exhibit excellent chip control performance over a wide range of conditions

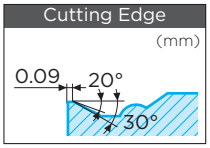
Cutting edge shape that retains its strength even after wear progresses

Chipbreaker Cross Section (CNMG120400 type)

Corner Part



Cutting Edge



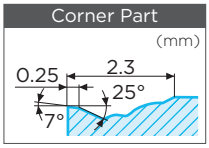
GU type — For Medium Cutting

Wide chip control range with grooved spherical protrusions

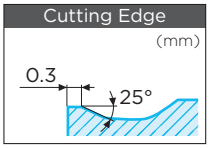
2-step rake face shape suppresses wear progress

Chipbreaker Cross Section (CNMG120400 type)

Corner Part



Cutting Edge



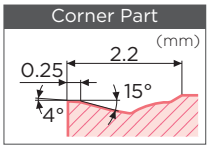
EH type — For Medium Cutting to Roughing

Spherical protrusions suppress resistance while controlling chips

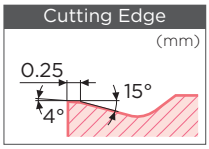
2-step rake face shape enhances fracture resistance

Chipbreaker Cross Section (CNMG120400 type)

Corner Part



Cutting Edge



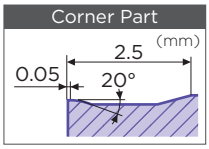
EM type — For Roughing

Large convex rake face design keeps its cutting edge strength while suppressing crater wear

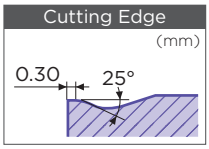
Suppresses notch wear by eliminating the change of cutting points on the cutting edge

Chipbreaker Cross Section (CNMG120400 type)

Corner Part

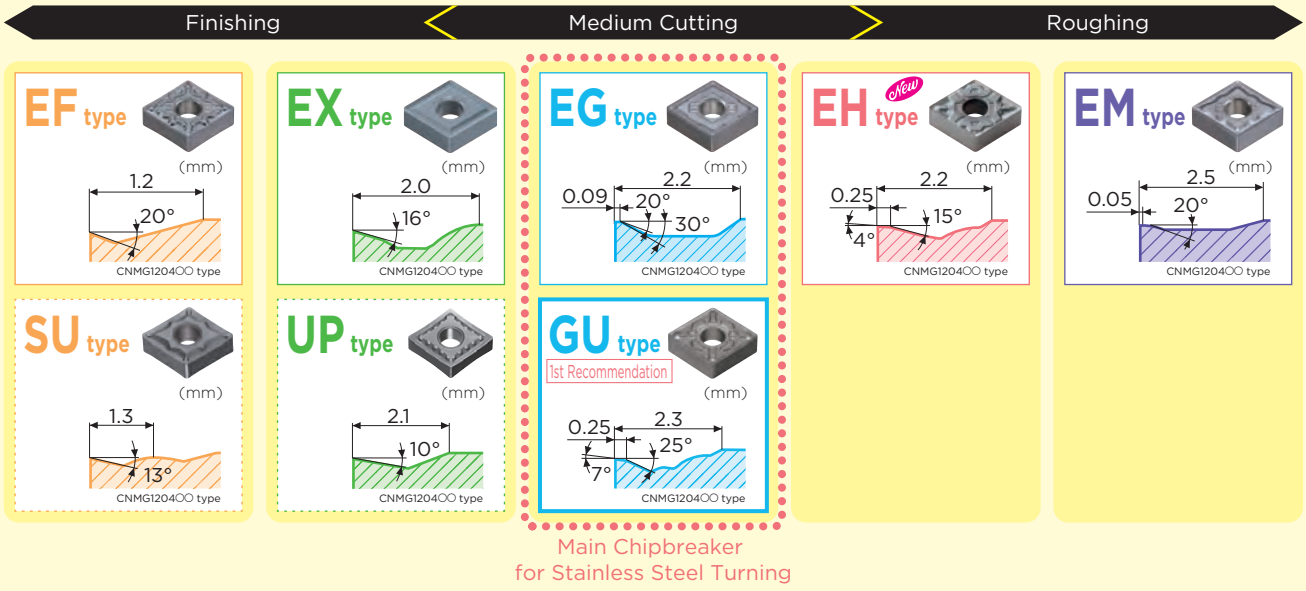


Cutting Edge

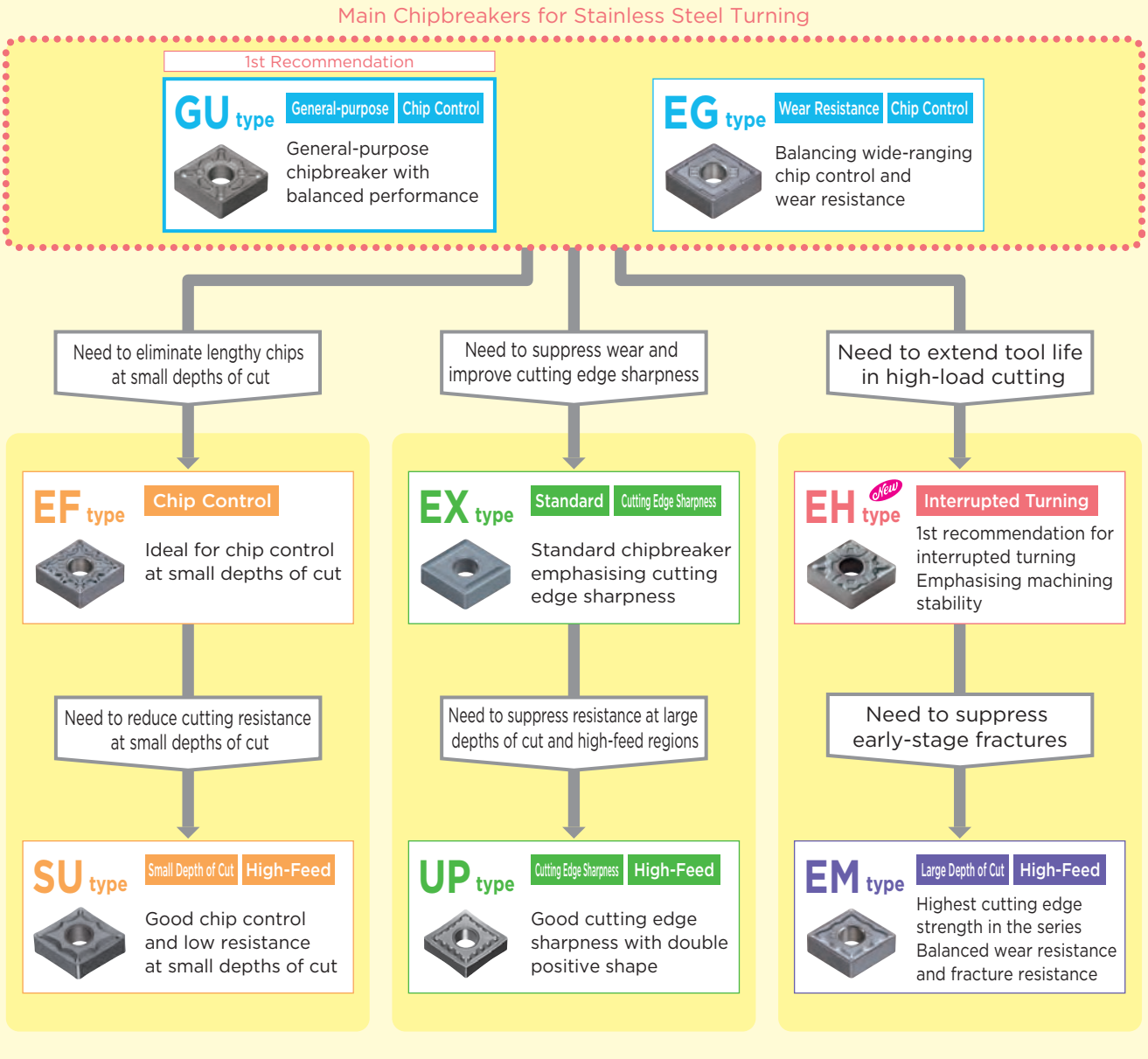


AC6020M/AC6030M/AC6135M/AC6145M

■ Applications of Chipbreakers (Negative Inserts): Application Range



■ Applications of Chipbreakers (Negative Inserts): Troubleshooting



AC6020M/AC6030M/AC6135M/AC6145M

80° Diamond type Negative Inserts

Shape	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
FE	CNMG 090304N-FE		●	●	●	9.525	3.18	3.81	0.4
	090308N-FE		●	●	●				0.8
	CNMG 090404N-FE		●	●	●	9.525	4.76	3.81	0.4
	090408N-FE		●	●	●				0.8
	CNMG 120402N-FE		●	●	●	12.7	4.76	5.16	0.2
	120404N-FE		●	●	●				0.4
	120408N-FE		●	●	●				0.8
	120412N-FE		●	●	●				1.2
LU	CNMG 090304N-LU		●			9.525	3.18	3.81	0.4
	090308N-LU		●						0.8
LU	CNMG 120402N-LU		●			12.7	4.76	5.16	0.2
	120404N-LU		●						0.4
	120408N-LU		●						0.8
	120412N-LU		●						1.2
Wiper LUW	CNMG 120404N-LUW		●			12.7	4.76	5.16	0.4
	120408N-LUW		●						0.8
	120412N-LUW		●						1.2
SU	CNMG 120402N-SU	●	●	●	●	12.7	4.76	5.16	0.2
	120404N-SU	●	●	●	●				0.4
	120408N-SU	●	●	●	●				0.8
	120412N-SU	●	●	●	●				1.2
EF	CNMG 090404N-EF	●	●	●	●	9.525	4.76	3.81	0.4
	090408N-EF	●	●	●	●				0.8
	CNMG 120404N-EF	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-EF	●	●	●	●				0.8
	120412N-EF	●	●	●	●				1.2
EX	CNMG 120404N-EX	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-EX	●	●	●	●				0.8
	120412N-EX	●	●	●	●				1.2
	120416N-EX			●	●				1.6
	CNMG 160612N-EX			●	●	15.875	6.35	6.35	1.2
	CNMG 190612N-EX			●	●	19.05	6.35	7.94	1.2
UP	CNMG 120404N-UP	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-UP	●	●	●	●				0.8
	120412N-UP	●	●	●	●				1.2
GU	CNMG 120404N-GU	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-GU	●	●	●	●				0.8
	120412N-GU	●	●	●	●				1.2
	120416N-GU			●	●				1.6
	CNMG 160608N-GU		●	●	●	15.875	6.35	6.35	0.8
	160612N-GU		●	●	●				1.2
	160616N-GU		●	●	●				1.6
EG	CNMG 090408N-EG	●	●	●	●	9.525	4.76	3.81	0.8
	090412N-EG	●	●	●	●				1.2
	CNMG 120404N-EG	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-EG	●	●	●	●				0.8
	120412N-EG	●	●	●	●				1.2
	CNMG 160608N-EG	●	●	●	●	15.875	6.35	6.35	0.8
	160612N-EG	●	●	●	●				1.2
	160616N-EG	●	●	●	●				1.6
	CNMG 190612N-EG	●	●	●	●	19.05	6.35	7.94	1.2
	190616N-EG	●	●	●	●				1.6
MU	CNMG 120408N-MU		●			12.7	4.76	5.16	0.8
	120412N-MU		●						1.2
	CNMG 160612N-MU		●			15.875	6.35	6.35	1.2
	160616N-MU		●						1.6
	CNMG 190612N-MU		●			19.05	6.35	7.94	1.2
	190616N-MU		●						1.6
New EH	CNMG 120404N-EH (New)			●	●	12.7	4.76	5.16	0.4
	120408N-EH (New)			●	●				0.8
	120412N-EH (New)			●	●				1.2
	120416N-EH (New)			●	●				1.6
	CNMG 190612N-EH (New)			●	●	19.05	6.35	7.94	1.2
	190616N-EH (New)			●	●				1.6
EM	CNMG 120408N-EM	●	●	●	●	12.7	4.76	5.16	0.8
	120412N-EM	●	●	●	●				1.2
	120416N-EM	●	●	●	●				1.6
	CNMG 160608N-EM	●	●	●	●	15.875	6.35	6.35	0.8
	160612N-EM	●	●	●	●				1.2
	160616N-EM	●	●	●	●				1.6
	CNMG 190612N-EM	●	●	●	●	19.05	6.35	7.94	1.2
	190616N-EM	●	●	●	●				1.6
	190624N-EM	●	●	●	●				2.4
	CNMG 250924N-EM		●	●	●	25.4	9.52	9.12	2.4

80° Diamond type Negative Inserts

Shape	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
MP	CNMM 120408N-MP	●	●	●	●	12.7	4.76	5.16	0.8
	120412N-MP	●	●	●	●				1.2
	120416N-MP	●	●						1.6
	CNMM 160608N-MP		●			15.875	6.35	6.35	0.8
	160612N-MP		●						1.2
	160616N-MP		●						1.6
	CNMM 190608N-MP		●			19.05	6.35	7.94	0.8
	190612N-MP	●	●						1.2
	190616N-MP	●	●	●	●				1.6
	190624N-MP	●	●	●	●				2.4

● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item) Blank: Made-to-order item Wiper: Wiper insert

AC6020M/AC6030M/AC6135M/AC6145M

55° Diamond type Negative Inserts

Shape	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
FE	DNMG 110404N-FE		●	●	●	9.525	4.76	3.81	0.4
	110408N-FE		●	●	●				0.8
	110412N-FE		●	●	●				1.2
	DNMG 150402N-FE		●	●	●	12.7	4.76	5.16	0.2
	150404N-FE		●	●	●				0.4
	150408N-FE		●	●	●				0.8
	150412N-FE		●	●	●				1.2
	DNMG 150602N-FE		●	●	●	12.7	6.35	5.16	0.2
	150604N-FE		●	●	●				0.4
	150608N-FE		●	●	●				0.8
	150612N-FE		●	●	●				1.2
LU	DNMG 110404N-LU		●			9.525	4.76	3.81	0.4
	110408N-LU		●						0.8
	DNMG 150402N-LU		●			12.7	4.76	5.16	0.2
	150404N-LU		●						0.4
	150408N-LU		●						0.8
	150412N-LU		●						1.2
SU	DNMG 110404N-SU	●	●	●	●	9.525	4.76	3.81	0.4
	110408N-SU	●	●	●	●				0.8
	110412N-SU	●	●	●	●				1.2
	DNMG 150402N-SU	●	●	●	●	12.7	4.76	5.16	0.2
	150404N-SU	●	●	●	●				0.4
	150408N-SU	●	●	●	●				0.8
	150412N-SU	●	●	●	●				1.2
EF	DNMG 110404N-EF	●	●	●	●	9.525	4.76	3.81	0.4
	110408N-EF	●	●	●	●				0.8
	110412N-EF	●	●	●	●				1.2
	DNMG 150404N-EF	●	●	●	●	12.7	4.76	5.16	0.4
	150408N-EF	●	●	●	●				0.8
	150412N-EF	●	●	●	●				1.2
	DNMG 150604N-EF	●	●	●	●	12.7	6.35	5.16	0.4
	150608N-EF	●	●	●	●				0.8
	150612N-EF	●	●	●	●				1.2
EX	DNMG 150404N-EX	●	●	●	●	12.7	4.76	5.16	0.4
	150408N-EX	●	●	●	●				0.8
	150412N-EX	●	●	●	●				1.2
	DNMG 150604N-EX	●	●	●	●	12.7	6.35	5.16	0.4
	150608N-EX	●	●	●	●				0.8
	150612N-EX	●	●	●	●				1.2
UP	DNMG 150404N-UP	●	●	●	●	12.7	4.76	5.16	0.4
	150408N-UP	●	●	●	●				0.8
	150412N-UP	●	●	●	●				1.2
GU	DNMG 110404N-GU	●	●	●	●	9.525	4.76	3.81	0.4
	110408N-GU	●	●	●	●				0.8
	110412N-GU	●	●	●	●				1.2
	DNMG 150404N-GU	●	●	●	●	12.7	4.76	5.16	0.4
	150408N-GU	●	●	●	●				0.8
	150412N-GU	●	●	●	●				1.2
	DNMG 150608N-GU	●	●	●	●	12.7	6.35	5.16	0.8
	150612N-GU	●	●	●	●				1.2
EG	DNMG 110408N-EG	●	●	●	●	9.525	4.76	3.81	0.8
	110412N-EG	●	●	●	●				1.2
	DNMG 150404N-EG	●	●	●	●	12.7	4.76	5.16	0.4
	150408N-EG	●	●	●	●				0.8
	150412N-EG	●	●	●	●				1.2
	DNMG 150604N-EG	●	●	●	●	12.7	6.35	5.16	0.4
	150608N-EG	●	●	●	●				0.8
	150612N-EG	●	●	●	●				1.2
MU	DNMG 150408N-MU		●			12.7	4.76	5.16	0.8
	150412N-MU		●						1.2
	DNMG 150608N-MU		●			12.7	6.35	5.16	0.8
	150612N-MU		●						1.2
EH	DNMG 150404N-EH (New)			●	●	12.7	4.76	5.16	0.4
	150408N-EH (New)			●	●				0.8
	150412N-EH (New)			●	●				1.2
	DNMG 150608N-EH (New)			●	●	12.7	6.35	5.16	0.8
	150612N-EH (New)			●	●				1.2
EM	DNMG 150408N-EM	●	●	●	●	12.7	4.76	5.16	0.8
	150412N-EM	●	●	●	●				1.2
	150416N-EM	●	●	●	●				1.6
	DNMG 150608N-EM	●	●	●	●	12.7	6.35	5.16	0.8
	150612N-EM	●	●	●	●				1.2
HM	DNMG 150404R-HM	●	●			12.7	4.76	5.16	0.4
	150404L-HM	●	●						0.4
	150408R-HM	●	●						0.8
	150408L-HM	●	●						0.8

Square type Negative Inserts

Shape	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
FE	SNMG 120404N-FE		●	●	●	12.7	4.76	5.16	0.4
	120408N-FE		●	●	●				0.8
	120412N-FE		●	●	●				1.2
LU	SNMG 120408N-LU		●			12.7	4.76	5.16	0.8
	120412N-LU		●						1.2
SU	SNMG 120408N-SU	●	●	●	●	12.7	4.76	5.16	0.8
EF	SNMG 120404N-EF	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-EF	●	●	●	●				0.8
EX	SNMG 120404N-EX	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-EX	●	●	●	●				0.8
	120412N-EX	●	●	●	●				1.2
	SNMG 150612N-EX			●	●	15.875	6.35	6.35	1.2
	SNMG 190612N-EX			●	●	19.05	6.35	7.94	1.2
UP	SNMG 120404N-UP	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-UP	●	●	●	●				0.8
	120412N-UP	●	●	●	●				1.2
GU	SNMG 120404N-GU	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-GU	●	●	●	●				0.8
	120412N-GU	●	●	●	●				1.2
	SNMG 150608N-GU		●	●	●	15.875	6.35	6.35	0.8
	150612N-GU		●	●	●				1.2
	150616N-GU		●	●	●				1.6
EG	SNMG 120404N-EG	●	●	●	●	12.7	4.76	5.16	0.4
	120408N-EG	●	●	●	●				0.8
	120412N-EG	●	●	●	●				1.2
	SNMG 150608N-EG	●	●	●	●	15.875	6.35	6.35	0.8
	150612N-EG	●	●	●	●				1.2
	150616N-EG	●	●	●	●				1.6
	SNMG 190612N-EG	●	●	●	●	19.05	6.35	7.94	1.2
	190616N-EG	●	●	●	●				1.6
MU	SNMG 120408N-MU		●			12.7	4.76	5.16	0.8
	120412N-MU		●						1.2
	SNMG 150612N-MU		●			15.875	6.35	6.35	1.2
	150616N-MU		●						1.6
	SNMG 190612N-MU		●			19.05	6.35	7.94	1.2
	190616N-MU		●						1.6
EH	SNMG 120404N-EH (New)			●	●	12.7	4.76	5.16	0.4
	120408N-EH (New)			●	●				0.8
	120412N-EH (New)			●	●				1.2
	SNMG 190612N-EH (New)			●	●	19.05	6.35	7.94	1.2
	190616N-EH (New)			●	●				1.6
EM	SNMG 120408N-EM	●	●	●	●	12.7	4.76	5.16	0.8
	120412N-EM	●	●	●	●				1.2
	SNMG 150608N-EM	●	●	●	●	15.875	6.35	6.35	0.8
	150612N-EM	●	●	●	●				1.2
	150616N-EM	●	●	●	●				1.6
	SNMG 190612N-EM	●	●	●	●	19.05	6.35	7.94	1.2
	190616N-EM	●	●	●	●				1.6
	190624N-EM	●	●	●	●				2.4
	SNMG 250924N-EM		●	●	●	25.4	9.52	9.12	2.4
HM	SNMG 120408R-HM	●	●			12.7	4.76	5.16	0.8
	120408L-HM	●	●						0.8
	SNMG 150608R-HM	●	●			15.875	6.35	6.35	0.8
	150608L-HM	●	●						0.8
MP	SNMM 120408N-MP	●	●	●	●	12.7	4.76	5.16	0.8
	120412N-MP	●	●	●	●				1.2
	120416N-MP		●						1.6
	SNMM 150612N-MP		●			15.875	6.35	6.35	1.2
	150616N-MP		●						1.6
	SNMM 190612N-MP	●	●	●	●	19.05	6.35	7.94	1.2
	190616N-MP	●	●	●	●				1.6
	SNMM 250724N-MP		●			25.4	7.94	9.12	2.4
	SNMM 250924N-MP		●			25.4	9.52	9.12	2.4
	SNMM 310924N-MP		●			31.75	9.52	8.8	2.4

● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item) Blank: Made-to-order item Wiper: Wiper insert

AC6020M/AC6030M/AC6135M/AC6145M

Triangular type Negative Inserts

Shape	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 FE	TNMG 160402N-FE		●	●	●	9.525	4.76	3.81	0.2
	160404N-FE		●	●	●				0.4
	160408N-FE		●	●	●				0.8
	160412N-FE		●	●	●				1.2
 LU	TNMG 160402N-LU		●			9.525	4.76	3.81	0.2
	160404N-LU		●						0.4
	160408N-LU		●						0.8
	160412N-LU		●						1.2
 SU	TNMG 160402N-SU	●	●	●	●	9.525	4.76	3.81	0.2
	160404N-SU	●	●	●	●				0.4
	160408N-SU	●	●	●	●				0.8
	160412N-SU	●	●	●	●				1.2
 EF	TNMG 160404N-EF	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-EF	●	●	●	●				0.8
 EX	TNMG 160404N-EX	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-EX	●	●	●	●				0.8
	160412N-EX	●	●	●	●				1.2
 UP	TNMG 160404N-UP	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-UP	●	●	●	●				0.8
	160412N-UP	●	●	●	●				1.2
	TNMG 220408N-UP			●	●	12.7	4.76	5.16	0.8
	220412N-UP			●	●				1.2
 GU	TNMG 160404N-GU	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-GU	●	●	●	●				0.8
	160412N-GU	●	●	●	●				1.2
	TNMG 220408N-GU			●	●	12.7	4.76	5.16	0.8
	220412N-GU			●	●				1.2
 EG	TNMG 160404N-EG	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-EG	●	●	●	●				0.8
	160412N-EG	●	●	●	●				1.2
 MU	TNMG 160408N-MU		●			9.525	4.76	3.81	0.8
	160412N-MU		●						1.2
	TNMG 220408N-MU			●	●	12.7	4.76	5.16	0.8
	220412N-MU			●	●				1.2
 EH	TNMG 160404N-EH (New)			●	●	9.525	4.76	3.81	0.4
	160408N-EH (New)			●	●				0.8
	160412N-EH (New)			●	●				1.2
 EM	TNMG 160408N-EM	●	●	●	●	9.525	4.76	3.81	0.8
	160412N-EM	●	●	●	●				1.2
	TNMG 330924N-EM		●	●	●	19.05	9.52	7.93	2.4
 HM	TNMG 160404R-HM	●	●			9.525	4.76	3.81	0.4
	160404L-HM	●	●						0.4
	160408R-HM	●	●						0.8
	160408L-HM	●	●						0.8

35° Diamond type Negative Inserts

Shape	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 FE	VNMG 160402N-FE		●	●	●	9.525	4.76	3.81	0.2
	160404N-FE		●	●	●				0.4
	160408N-FE		●	●	●				0.8
	160412N-FE		●	●	●				1.2
 LU	VNMG 160402N-LU		●			9.525	4.76	3.81	0.2
	160404N-LU		●						0.4
	160408N-LU		●						0.8
 SU	VNMG 160402N-SU	●	●	●	●	9.525	4.76	3.81	0.2
	160404N-SU	●	●	●	●				0.4
	160408N-SU	●	●	●	●				0.8
 EF	VNMG 160402N-EF	●	●	●	●	9.525	4.76	3.81	0.2
	160404N-EF	●	●	●	●				0.4
	160408N-EF	●	●	●	●				0.8
 EX	VNMG 160404N-EX	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-EX	●	●	●	●				0.8
 UP	VNMG 160404N-UP	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-UP	●	●	●	●				0.8
 GU	VNMG 160404N-GU	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-GU	●	●	●	●				0.8
	160412N-GU			●	●				1.2
 EG	VNMG 160404N-EG	●	●	●	●	9.525	4.76	3.81	0.4
	160408N-EG	●	●	●	●				0.8
	160412N-EG	●	●	●	●				1.2

Trigon type Negative Inserts

Shape	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 FE	WNMG 060404N-FE		●	●	●	9.525	4.76	3.81	0.4
	060408N-FE		●	●	●				0.8
	WNMG 080402N-FE		●	●	●	12.7	4.76	5.16	0.2
	080404N-FE		●	●	●				0.4
	080408N-FE		●	●	●				0.8
	080412N-FE		●	●	●				1.2
 LU	WNMG 080404N-LU		●			12.7	4.76	5.16	0.4
	080408N-LU		●						0.8
	080412N-LU		●						1.2
 Wiper LUW	WNMG 060404N-LUW		●			9.525	4.76	3.81	0.4
	060408N-LUW		●						0.8
 Wiper LUW	WNMG 080404N-LUW		●			12.7	4.76	5.16	0.4
	080408N-LUW		●						0.8
	080412N-LUW		●						1.2
 SU	WNMG 060404N-SU	●	●	●	●	9.525	4.76	3.81	0.4
	060408N-SU	●	●	●	●				0.8
	060412N-SU	●	●	●	●				1.2
	WNMG 080404N-SU	●	●	●	●	12.7	4.76	5.16	0.4
	080408N-SU	●	●	●	●				0.8
	080412N-SU	●	●	●	●				1.2
 EF	WNMG 060404N-EF	●	●	●	●	9.525	4.76	3.81	0.4
	060408N-EF	●	●	●	●				0.8
	WNMG 080404N-EF	●	●	●	●	12.7	4.76	5.16	0.4
	080408N-EF	●	●	●	●				0.8
 EX	WNMG 080404N-EX	●	●	●	●	12.7	4.76	5.16	0.4
	080408N-EX	●	●	●	●				0.8
	080412N-EX	●	●	●	●				1.2
 UP	WNMG 080408N-UP	●	●	●	●	12.7	4.76	5.16	0.8
	080412N-UP	●	●	●	●				1.2
 GU	WNMG 060404N-GU	●	●	●	●	9.525	4.76	3.81	0.4
	060408N-GU	●	●	●	●				0.8
	060412N-GU	●	●	●	●				1.2
	WNMG 080404N-GU	●	●	●	●	12.7	4.76	5.16	0.4
	080408N-GU	●	●	●	●				0.8
	080412N-GU	●	●	●	●				1.2
 EG	WNMG 060408N-EG	●	●	●	●	9.525	4.76	3.81	0.8
	060412N-EG	●	●	●	●				1.2
	WNMG 080404N-EG	●	●	●	●	12.7	4.76	5.16	0.4
	080408N-EG	●	●	●	●				0.8
	080412N-EG	●	●	●	●				1.2
 MU	WNMG 080408N-MU		●			12.7	4.76	5.16	0.8
	080412N-MU		●						1.2
 EH	WNMG 080404N-EH (New)			●	●	12.7	4.76	5.16	0.4
	080408N-EH (New)			●	●				0.8
	080412N-EH (New)			●	●				1.2
	080416N-EH (New)			●	●				1.6
 EM	WNMG 080408N-EM	●	●	●	●	12.7	4.76	5.16	0.8
	080412N-EM	●	●	●	●				1.2

● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item) Blank: Made-to-order item Wiper: Wiper insert

AC6020M/AC6030M/AC6135M/AC6145M

80° Diamond type Positive Inserts

Shape	Relief Angle	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 LU	7	CCMT 060202N-LU		●	●	●	6.35	2.38	2.8	0.2
		060204N-LU		●	●	●				0.4
		CCMT 09T304N-LU		●	●	●	9.525	3.97	4.4	0.4
		09T308N-LU		●	●	●				0.8
 LB	7	CCMT 060202N-LB	●	●	●	●	6.35	2.38	2.8	0.2
		060204N-LB	●	●	●	●				0.4
		060208N-LB	●	●	●	●				0.8
		CCMT 09T302N-LB	●	●	●	●	9.525	3.97	4.4	0.2
		09T304N-LB	●	●	●	●				0.4
		09T308N-LB	●	●	●	●				0.8
 SU	7	CCMT 060202N-SU	●	●	●	●	6.35	2.38	2.8	0.2
		060204N-SU	●	●	●	●				0.4
		060208N-SU	●	●	●	●				0.8
		CCMT 09T302N-SU	●	●	●	●	9.525	3.97	4.4	0.2
		09T304N-SU	●	●	●	●				0.4
		09T308N-SU	●	●	●	●				0.8
 GU	7	CCMT 060204N-GU	●	●	●	●	6.35	2.38	2.8	0.4
		060208N-GU	●	●	●	●				0.8
		CCMT 09T304N-GU	●	●	●	●	9.525	3.97	4.4	0.4
		09T308N-GU	●	●	●	●				0.8
 MU	7	CCMT 09T304N-MU	●	●			9.525	3.97	4.4	0.4
		09T308N-MU	●	●						0.8
 LU	11	CPMT 090304N-LU		●	●	●	9.525	3.18	4.4	0.4
		090308N-LU		●	●	●				0.8
 LB	11	CPMT 080204N-LB	●	●	●	●	7.94	2.38	3.4	0.4
		CPMT 090304N-LB	●	●	●	●	9.525	3.18	4.4	0.4
		090308N-LB	●	●	●	●				0.8
 SU	11	CPMT 090304N-SU	●	●	●	●	9.525	3.18	4.4	0.4
		090308N-SU	●	●	●	●				0.8
 GU	11	CPMT 090304N-GU	●	●	●	●	9.525	3.18	4.4	0.4
		090308N-GU	●	●	●	●				0.8
 MU	11	CPMT 090304N-MU	●	●			9.525	3.18	4.4	0.4
		090308N-MU	●	●						0.8

55° Diamond type Positive Inserts

Shape	Relief Angle	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 LU	7	DCMT 070202N-LU		●	●	●	6.35	2.38	2.8	0.2
		070204N-LU		●	●	●				0.4
		DCMT 11T302N-LU			●	●	9.525	3.97	4.4	0.2
		11T304N-LU		●	●	●				0.4
		11T308N-LU		●	●	●				0.8
 LB	7	DCMT 070202N-LB	●	●	●	●	6.35	2.38	2.8	0.2
		070204N-LB	●	●	●	●				0.4
		070208N-LB	●	●	●	●				0.8
		DCMT 11T302N-LB	●	●	●	●	9.525	3.97	4.4	0.2
		11T304N-LB	●	●	●	●				0.4
		11T308N-LB	●	●	●	●				0.8
 SU	7	DCMT 070202N-SU	●	●	●	●	6.35	2.38	2.8	0.2
		070204N-SU	●	●	●	●				0.4
		070208N-SU	●	●	●	●				0.8
		DCMT 11T302N-SU	●	●	●	●	9.525	3.97	4.4	0.2
		11T304N-SU	●	●	●	●				0.4
		11T308N-SU	●	●	●	●				0.8
 GU	7	DCMT 070204N-GU	●	●	●	●	6.35	2.38	2.8	0.4
		070208N-GU	●	●	●	●				0.8
		DCMT 11T302N-GU	●	●	●	●	9.525	3.97	4.4	0.2
		11T304N-GU	●	●	●	●				0.4
		11T308N-GU	●	●	●	●				0.8
		11T312N-GU		●						1.2
 MU	7	DCMT 11T304N-MU	●	●			9.525	3.97	4.4	0.4
		11T308N-MU	●	●						0.8

Square type Positive Inserts

Shape	Relief Angle	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 LU	7	SCMT 09T304N-LU		●	●	●	9.525	3.97	4.4	0.4
		09T308N-LU		●	●	●				0.8
 LB	7	SCMT 09T304N-LB	●	●	●	●	9.525	3.97	4.4	0.4
		09T308N-LB	●	●	●	●				0.8
 SU	7	SCMT 09T304N-SU	●	●	●	●	9.525	3.97	4.4	0.4
		09T308N-SU	●	●	●	●				0.8
 GU	7	SCMT 09T304N-GU	●	●	●	●	9.525	3.97	4.4	0.4
		09T308N-GU	●	●	●	●				0.8
 MU	7	SCMT 09T308N-MU	●	●			9.525	3.97	4.4	0.8
 LU	11	SPMT 090304N-LU		●	●	●	9.525	3.18	3.4	0.4
		090308N-LU		●	●	●				0.8
 LB	11	SPMT 090304N-LB	●	●	●	●	9.525	3.18	3.4	0.4
		090308N-LB	●	●	●	●				0.8

Triangular type Positive Inserts

Shape	Relief Angle	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 LU	7	TCMT 110204N-LU		●	●	●	6.35	2.38	2.8	0.4
		110208N-LU		●	●	●				0.8
 LB	7	TCMT 110204N-LB	●	●	●	●	6.35	2.38	2.8	0.4
		110208N-LB	●	●	●	●				0.8
 SU	7	TCMT 110204N-SU	●	●	●	●	6.35	2.38	2.8	0.4
		110208N-SU	●	●	●	●				0.8
		TCMT 16T304N-SU	●	●	●	●	9.525	3.97	4.3	0.4
		16T308N-SU	●	●	●	●				0.8
 LU	11	TPMT 080202N-LU		●	●	●	4.76	2.38	2.4	0.2
		080204N-LU		●	●	●				0.4
		TPMT 110302N-LU			●	●	6.35	3.18	3.4	0.2
		110304N-LU		●	●	●				0.4
		110308N-LU		●	●	●				0.8
 LB	11	TPMT 080202N-LB	●	●	●	●	4.76	2.38	2.4	0.2
		080204N-LB	●	●	●	●				0.4
		TPMT 090202N-LB	●	●	●	●	5.56	2.38	2.8	0.2
		090204N-LB	●	●	●	●				0.4
		TPMT 110302N-LB	●	●	●	●	6.35	3.18	3.4	0.2
		110304N-LB	●	●	●	●				0.4
		110308N-LB	●	●	●	●				0.8
		TPMT 160304N-LB	●	●	●	●	9.525	3.18	4.4	0.4
		160308N-LB	●	●	●	●				0.8
		TPMT 160404N-LB	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-LB	●	●	●	●				0.8
 SU	11	TPMT 080202N-SU	●	●	●	●	4.76	2.38	2.4	0.2
		080204N-SU	●	●	●	●				0.4
		TPMT 110302N-SU	●	●	●	●	6.35	3.18	3.4	0.2
		110304N-SU	●	●	●	●				0.4
		110308N-SU	●	●	●	●				0.8
		TPMT 160404N-SU	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-SU	●	●	●	●				0.8
 GU	11	TPMT 110304N-GU	●	●	●	●	6.35	3.18	3.4	0.4
		110308N-GU	●	●	●	●				0.8
		TPMT 160404N-GU	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-GU	●	●	●	●				0.8
 MU	11	TPMT 110304N-MU	●	●			6.35	3.18	3.4	0.4
		110308N-MU	●	●						0.8
 MU	11	TPMT 160404N-MU	●	●			9.525	4.76	4.4	0.4
		160408N-MU	●	●						0.8

● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item) Blank: Made-to-order item Wiper: Wiper insert

AC6020M/AC6030M/AC6135M/AC6145M

35° Diamond type Positive Inserts

Shape	Relief Angle	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 LU	5	**VBMT 110304N-LU**			●	●	6.35	3.18	2.8	0.4
		110308N-LU		●	●	●				0.8
		VBMT 160404N-LU		●	●	●	9.525	4.76	4.4	0.4
		160408N-LU		●	●	●				0.8
 LB	5	**VBMT 110302N-LB**	●	●	●	●	6.35	3.18	2.8	0.2
		110304N-LB	●	●	●	●				0.4
		110308N-LB	●	●	●	●				0.8
		VBMT 160404N-LB	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-LB	●	●	●	●				0.8
		160412N-LB	●	●	●	●				1.2
 SU	5	**VBMT 110302N-SU**			●	●	6.35	3.18	2.8	0.2
		110304N-SU			●	●				0.4
		110308N-SU	●	●	●	●				0.8
		VBMT 160404N-SU	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-SU	●	●	●	●				0.8
 GU	5	**VBMT 110304N-GU**	●	●	●	●	6.35	3.18	2.8	0.4
		110308N-GU	●	●	●	●				0.8
		VBMT 160404N-GU	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-GU	●	●	●	●				0.8
 LU	7	**VCMT 160404N-LU**		●	●	●	9.525	4.76	4.4	0.4
		160408N-LU		●	●	●				0.8
 LB	7	**VCMT 080202N-LB**	●	●	●	●	4.76	2.38	2.3	0.2
		080204N-LB	●	●	●	●				0.4
		VCMT 160404N-LB	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-LB	●	●	●	●				0.8
 SU	7	**VCMT 080204N-SU**	●	●	●	●	4.76	2.38	2.3	0.4
		VCMT 110302N-SU	●	●	●	●	6.35	3.18	2.8	0.2
		110304N-SU	●	●	●	●				0.4
		110308N-SU	●	●	●	●				0.8
		VCMT 160404N-SU	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-SU	●	●	●	●				0.8
 GU	7	**VCMT 160404N-GU**	●	●	●	●	9.525	4.76	4.4	0.4
		160408N-GU	●	●	●	●				0.8

Positive Trigon type

Shape	Relief Angle	Cat. No.	Stock AC6020M	Stock AC6030M	Stock AC6135M (New)	Stock AC6145M (New)	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 LB	11	**WPMT 110204N-LB**	●	●			6.35	2.38	2.8	0.4
		WPMT 160308N-LB	●	●			9.525	3.18	4.4	0.8

● mark: Standard stocked item ● mark: Standard stocked item (new product/expanded item) Blank: Made-to-order item Wiper: Wiper insert

AC6020M/AC6030M/AC6135M/AC6145M

■ Recommended Cutting Conditions

(Red text indicates 1st recommendation)

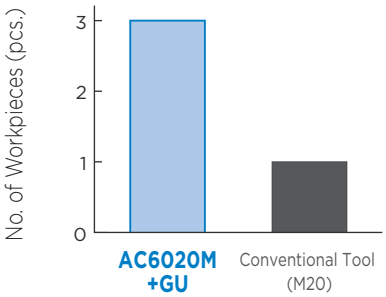
Work Material	Application	Chipbreaker	Grade	Cutting Conditions Min. - **Optimum** - Max.		
				Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Ferritic SUS405 SUS410L SUS430, etc.	Finishing	EF(SU)	**AC6020M**	0.5 - **1.5** - 2.0	0.05 - **0.15** - 0.25	170 - **230** - 300
	Continuous	**EG**/**GU**/EX	**AC6030M**	1.0 - **2.5** - 4.0	0.10 - **0.25** - 0.40	140 - **170** - 250
	Light Interruption	GU/EH	**AC6135M**	1.0 - **3.0** - 5.0	0.20 - **0.35** - 0.50	140 - **170** - 200
	Interrupted	EH/EM	**AC6145M**	1.5 - **3.5** - 6.0	0.25 - **0.40** - 0.60	100 - **130** - 160
Martensitic SUS410 SUS420J2 SUS440C, etc.	Finishing	EF(SU)	**AC6020M**	0.5 - **1.5** - 2.0	0.05 - **0.15** - 0.25	120 - **180** - 240
	Continuous	**EG**/**GU**/EX	**AC6030M**	1.0 - **2.5** - 4.0	0.10 - **0.25** - 0.40	100 - **150** - 200
	Light Interruption	GU/EH	**AC6135M**	1.0 - **3.0** - 5.0	0.20 - **0.35** - 0.50	80 - **130** - 180
	Interrupted	EH/EM	**AC6145M**	1.5 - **3.5** - 6.0	0.25 - **0.40** - 0.60	60 - **100** - 140
Austenitic SUS304 SUS316 SUS321, etc.	Finishing	EF (SU)/EX	**AC6030M**	0.5 - **1.5** - 2.0	0.05 - **0.15** - 0.25	120 - **180** - 240
	Continuous	EG/GU	**AC6135M**	1.0 - **2.5** - 4.0	0.10 - **0.25** - 0.40	100 - **150** - 200
	Light Interruption	**GU**/**EH**	**AC6135M**	1.0 - **3.0** - 5.0	0.20 - **0.35** - 0.50	80 - **130** - 180
	Interrupted	EH/EM	**AC6145M**	1.5 - **3.5** - 6.0	0.25 - **0.40** - 0.60	60 - **100** - 140
Duplex SUS329J1 SUS329J3L SUS329J4L, etc.	Finishing	EF (SU)/EX	**AC6030M**	0.5 - **1.5** - 2.0	0.05 - **0.15** - 0.25	100 - **140** - 180
	Continuous	EG/GU	**AC6135M**	1.0 - **2.5** - 4.0	0.10 - **0.25** - 0.40	80 - **120** - 160
	Light Interruption	**GU**/**EH**	**AC6135M**	1.0 - **3.0** - 5.0	0.20 - **0.35** - 0.50	70 - **100** - 140
	Interrupted	EH/EM	**AC6145M**	1.5 - **3.5** - 6.0	0.25 - **0.40** - 0.60	50 - **80** - 120
Precipitation Hardened Structures SUS630 SUS631 SUS632J1, etc.	Finishing	EF(SU)	**AC6020M**	0.5 - **1.5** - 2.0	0.05 - **0.15** - 0.25	90 - **115** - 140
	Continuous	**EG**/**GU**/EX	**AC6030M**	1.0 - **2.5** - 4.0	0.10 - **0.25** - 0.40	70 - **90** - 130
	Light Interruption	GU/EH	**AC6135M**	1.0 - **3.0** - 5.0	0.20 - **0.35** - 0.50	50 - **80** - 120
	Interrupted	EH/EM	**AC6145M**	1.5 - **3.5** - 6.0	0.25 - **0.40** - 0.60	40 - **70** - 100

■ Application Examples of AC6020M / AC6030M

SUS316 Component

AC6020M M

AC6020M has good wear resistance with 3x longer tool life



Tool Used: CNMG120408N-GU (AC6020M) Continuous Turning
Cutting Conditions: vc = 180m/min f = 0.25mm/rev
ap = 3.0mm Wet

SUS316L Casing

AC6020M M

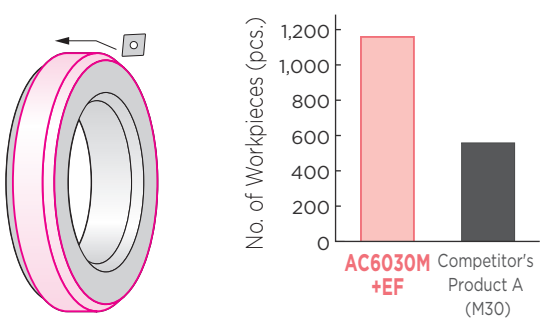
AC6020M's excellent chipping resistance performance improves tool life by 30%

Tool Used: SNMG120412N-GU (AC6020M) Continuous Turning
Cutting Conditions: vc = 180m/min f = 0.25mm/rev
ap = 2.5mm Wet

SUS430 Motorcycle Component

AC6030M M

AC6030M provides stable machined surface quality and achieves double the tool life thanks to excellent adhesion resistance performance

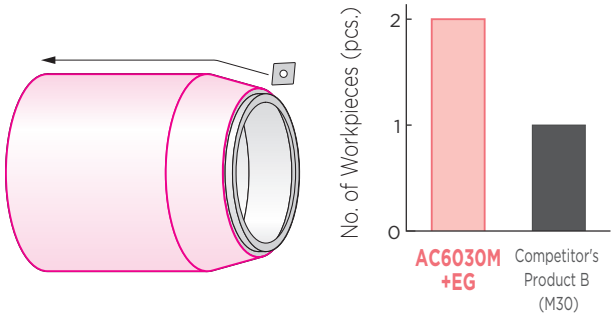


Tool Used: CNMG120404N-EF (AC6030M) Continuous Turning
Cutting Conditions: vc = 120m/min f = 0.1mm/rev
ap = 0.8 to 1.5mm Wet

SCS11 Pump Component

AC6030M M

AC6030M achieves double the tool life at 2.5x efficiency (vc = 60 → 100m/min, f = 0.2 → 0.3mm/rev) as well

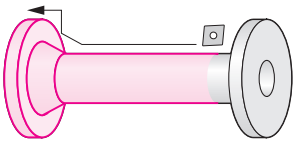


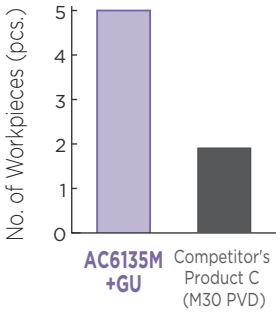
Tool Used: CNMG120408N-EG (AC6030M) Continuous Turning
Cutting Conditions: vc = 100m/min f = 0.3mm/rev
ap = 0.5mm Wet

■ Application Examples of AC6135M / AC6145M

SUS316L Pipe — AC6135M — M

AC6135M suppresses crater wear and realises 2.5x tool life

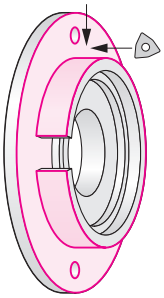




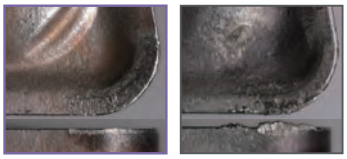
Tool Used: CNMG120408N-GU (AC6135M)
Cutting Conditions: vc = 150m/min f = 0.25mm/rev
ap = 1.5mm Wet

SUS316L Flange — AC6135M — M

AC6135M suppresses crater wear and adhesion and realises stable machining



Cutting edge at preset output

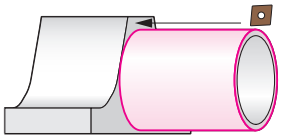


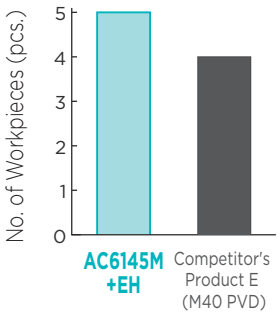
AC6135M+GU — Competitor's Product D (M30 PVD)

Tool Used: WNMG080408N-GU (AC6135M)
Cutting Conditions: vc = 130m/min f = 0.15mm/rev
ap = 1.0mm Wet

SCS16 Valve — AC6145M — M

AC6145M suppresses fractures and realises 1.3x longer tool life

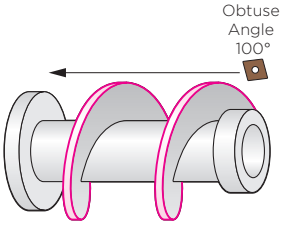




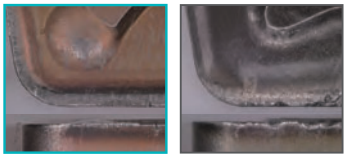
Tool Used: CNMG120408N-EH (AC6145M) Interrupted Turning
Cutting Conditions: vc = 110m/min f = 0.15mm/rev
ap = 1.0mm Wet

SUS316L Screw — AC6145M — M

AC6145M suppresses chipping and thermal cracking and realises stable machining



Cutting edge at preset output



AC6145M+GU — Competitor's Product F (M30 PVD)

Tool Used: CNMG120412N-GU (AC6145M) Interrupted Turning
Cutting Conditions: vc = 110m/min f = 0.15mm/rev
ap = 1.5mm Wet

< SAFETY NOTES >

- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.
- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.
- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

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(2024.6) I TP/AK