MITSUBISHI MITSUBISHI MATERIALS TOOL NEWS
2017.3 Update B045A YOUR GLOBAL CRAFTSMAN STUDIO

Chip Breaker System for Heavy Cutting

Series Expansion

Specially designed for heavy cutting of stainless and alloy steels.

MC6025/MC6035
UE6110/UH6400
US735

+

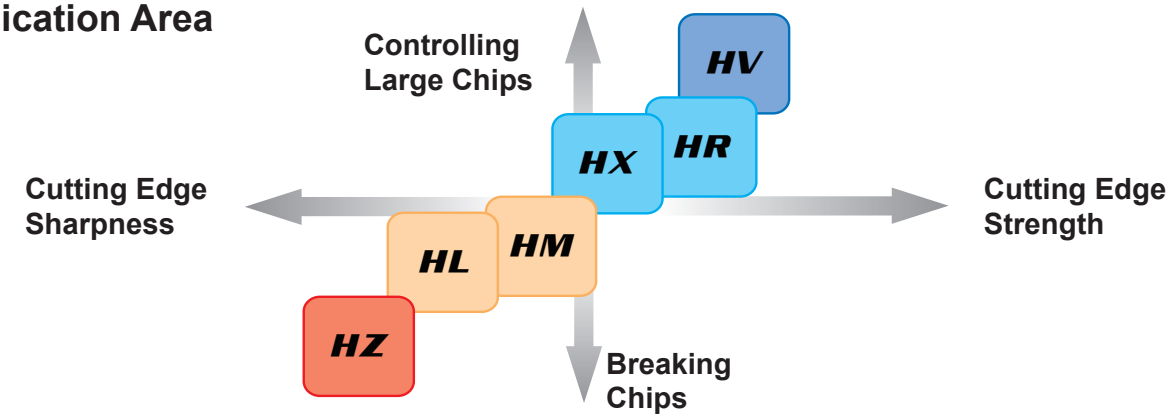
HZ/HL
HM/HX
HV/HR

Chip Breaker System for Heavy Cutting

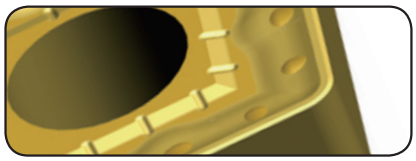
MC6025/MC6035 UE6110/UH6400 US735 + HZ/HL HM/HX HV/HR

Main Chip Breakers

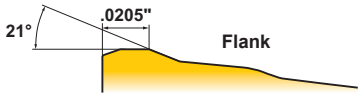
Application Area



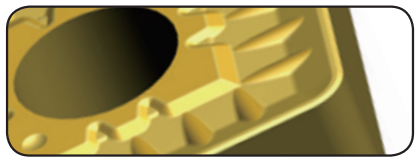
HX — First Recommendation for Heavy Cutting of General Steel and Alloy Steel



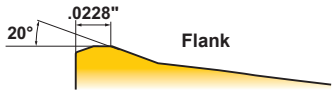
Covers the medium range of the heavy cutting region. The straight edge and chamfer gives a balance of sharpness and strength. Variable land and a wavy chip breaker makes for good chip control.



HR — Alternative Chip Breaker for Heavy Cutting of General Steel and Alloy Steel

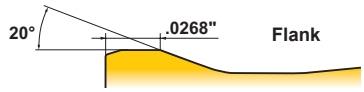


Covers the heavy cutting region by using a straight cutting edge with high edge strength.
It exhibits smooth chip control during large depths of cut and high feed rate machining.

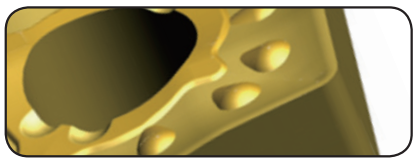


HV — Alternative Chip Breaker for Heavy Cutting of General Steel and Alloy Steel

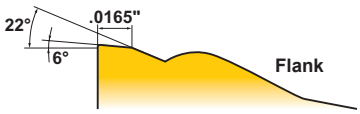
Covers the upper end of the heavy cutting region. Wide land and large chamfer offer high edge strength. A wide chip breaker prevents chip jamming.



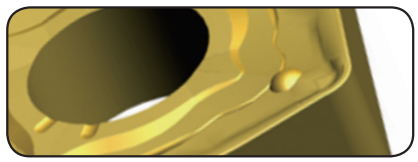
HZ — Alternative Chip Breaker for Heavy Cutting of Mild Steel and Stainless Steel



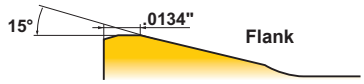
Covers the lower end of the heavy cutting region. Low cutting resistance due to positive land and curved edge. Teardrop dots improve chip control without increasing cutting resistance.



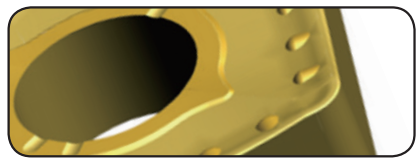
HL — First Recommendation for Heavy Cutting of Mild Steel and Stainless Steel



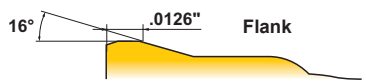
Covers the lower end of the heavy cutting region. The curved edge and narrow chamfer allow good chip control and sharp cutting action. Dots on the nose radius ensure chip control at low depths of cut.



HM — Alternative Chip Breaker for Heavy Cutting of Mild Steel and Stainless Steel



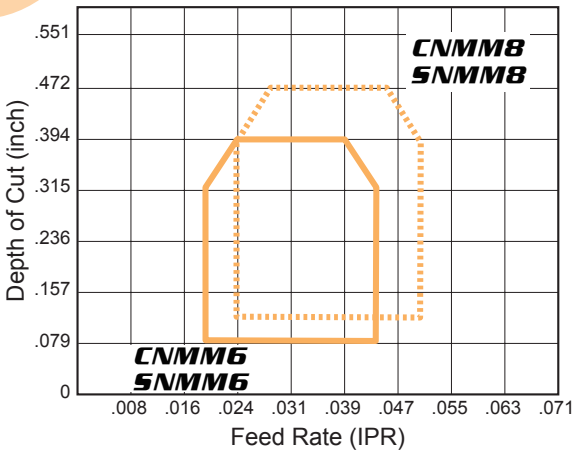
Covers the lower end through to the medium range of the heavy cutting region. The curved edge and narrow chamfer allow good chip control and sharp cutting action. Teardrop dots provided along the cutting edge ensures chip control even with variable depths of cut.



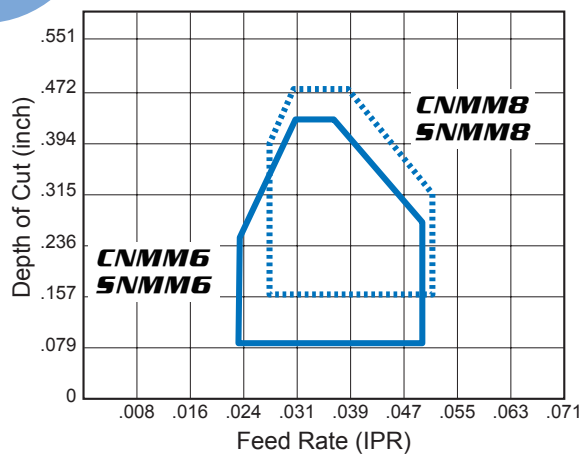
Effective Chip Control Range

<Cutting Conditions>
Work Material : AISI 4140
Cutting Speed : 490 SFM
Cutting Mode : Dry Cutting

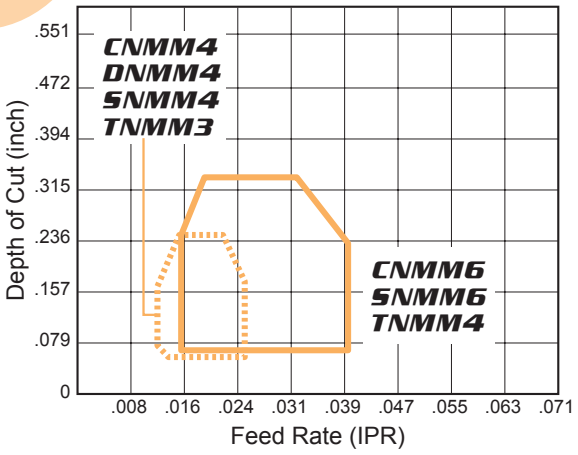
HM



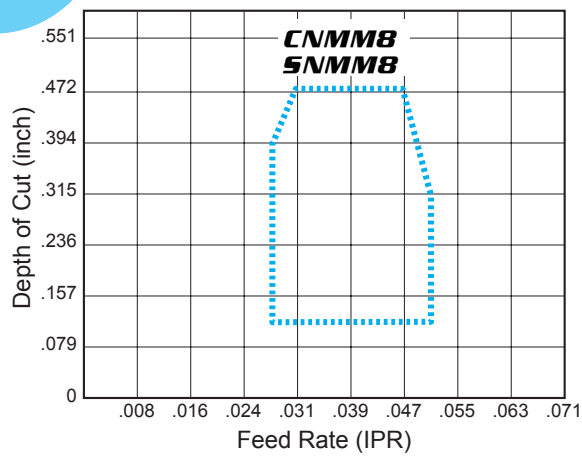
HV



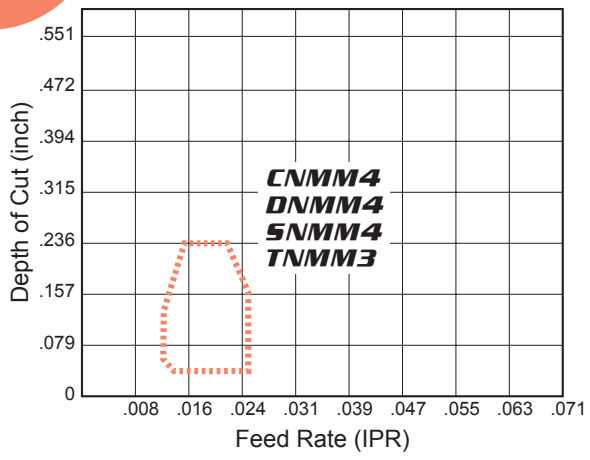
HL



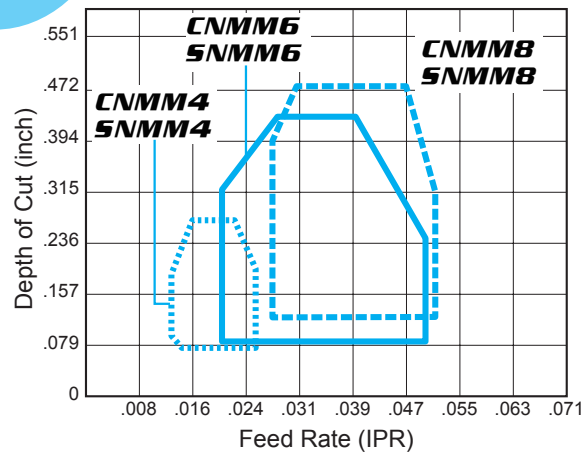
HR



HZ

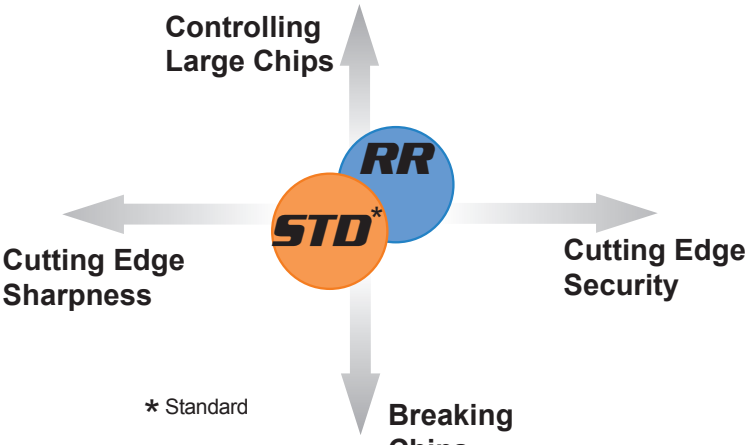


HX

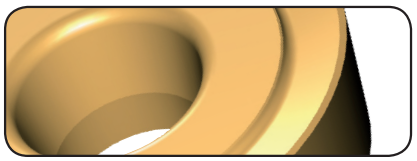


Chip Breaker System for Heavy Cutting

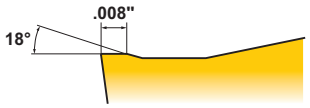
Application Area



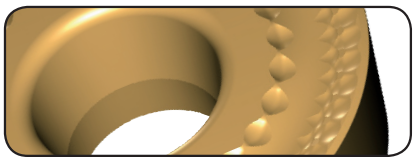
STD* **Medium Cutting of General Steel, Alloy Steel and Stainless Steel**



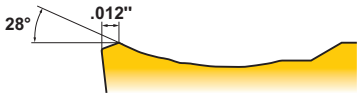
Balance of edge strength and sharpness due to a combination of a flat land and large rake angle.



RR **Heavy Cutting of General Steel and Alloy Steel**

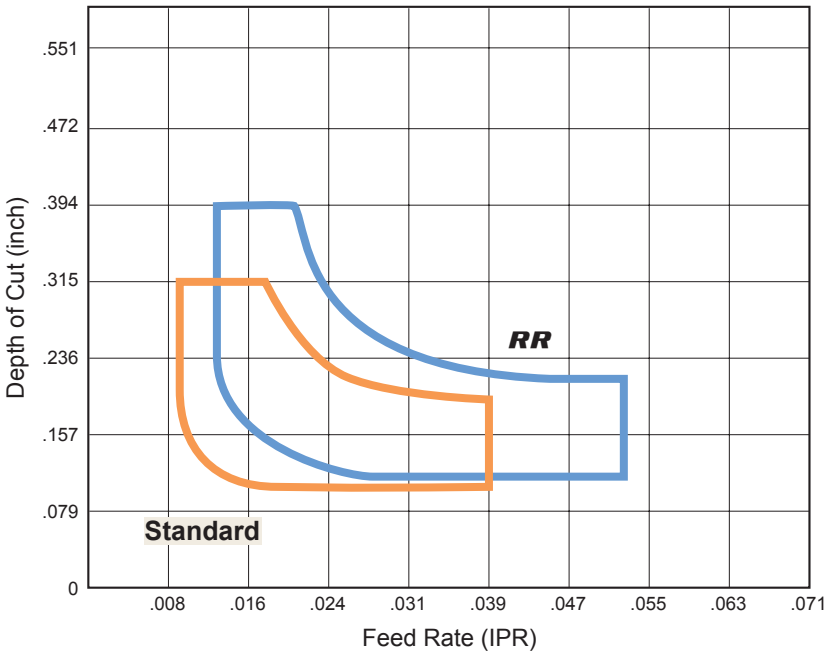


A wide groove chip breaker prevents chips from jamming at large depths of cut. Small dimples improve chip control at small depths of cut.



Effective Chip Control Range

<Cutting Conditions>
Work Material : AISI 4140
Insert : RCMX2006M0-RR, Standard
Cutting Speed : 330 SFM
Cutting Mode : Dry Cutting

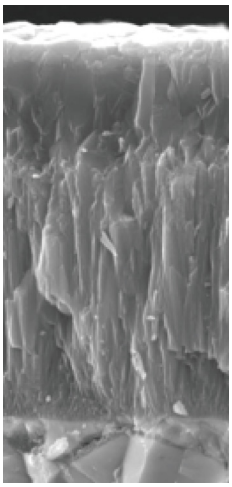


Recommended Insert Grades for Heavy Cutting

NEW

MC6035

Prevents Severe Damage for Increased Stability

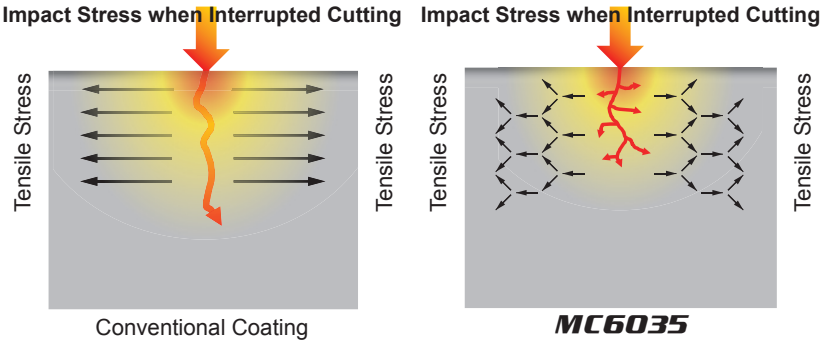


The smooth coating surface provides excellent welding resistance. With the thickened TiCN, MC6035 also achieves superior wear resistance for increased stability.

Micro-structure of *MC6035*

Reducing the Effect of Severe Fracturing

By reducing the tensile stress in the coating layer during interrupted cutting, crack development caused by impact stress is prevented.



Conventional products tend to result in fracturing because impact stress is transmitted deep into the coating layer during interrupted cutting.

MC6035 has succeeded in alleviating tensile stress in the coating layer therefore, cracks that can develop by impact stress can be prevented when interrupted cutting.

MC6025

Smooth Coating Surface

Prevents abnormal damage and weld chipping

Flat Al_2O_3

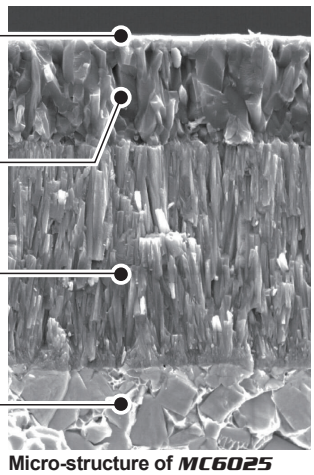
Excellent heat resistance

Microscopic TiCN

High wear resistance

Special Carbide Substrate

Prevents crack development
Stable tool life



Micro-structure of *MC6025*

2 IN 1 TECHNOLOGY

2-in-1 technology delivers the ultimate cutting perfomance.

US735

US735 solves welding problems in low speed cutting of mild steel and abnormal wear problems such as fracturing of cutting edge in medium to low speed, interrupted machining.
CVD coated carbide grade US735 is suitable not only for stainless steel but also for nickel (Ni) based super alloys, which are among the hardest of the difficult-to-cut materials to machine.

UH6400

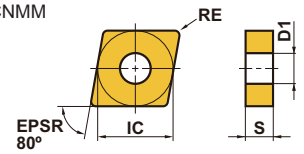
UH6400, a grade specially designed for heavy cutting.
Ensuring lengthened tool life during interrupted cutting of surface scale and longer continuous cutting of pre-machined parts.

Chip Breaker System for Heavy Cutting

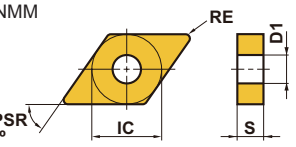
Negative Inserts (with hole)

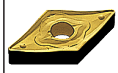
M Class

CNMM



DNMM



Heavy	Heavy	Heavy	Heavy
HV	HR	HX	HM
			
Heavy	Heavy	Heavy	Heavy
HL	HZ	HL	HZ
			

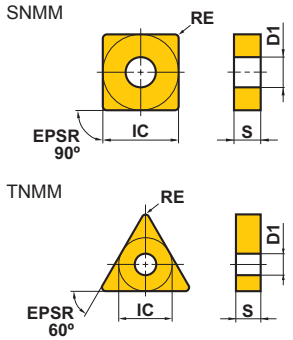
(inch)

Order Number	Cutting Area	UE6105	UE6110	MC6025	MC6035 (NEW)	UH6400	US735	IC	S	RE	D1
CNMM644HV	H		●	★	★	★		.750	.250	.063	.312
CNMM646HV	H		●	★	★	★		.750	.250	.094	.312
CNMM866HV	H		●	★	★	★		1.000	.375	.094	.359
CNMM866HR	H			★	★			1.000	.375	.094	.359
CNMM432HX	H			★	★			.500	.187	.031	.203
CNMM433HX	H			★	★			.500	.187	.047	.203
CNMM543HX	H			★	★			.625	.250	.047	.250
CNMM544HX	H			★	★			.625	.250	.063	.250
CNMM643HX	H		●	●	★	★		.750	.250	.047	.312
CNMM644HX	H		●	●	★	★		.750	.250	.063	.312
CNMM646HX	H		●	●	★	★		.750	.250	.094	.312
CNMM866HX	H		●	●	★	★		1.000	.375	.094	.359
CNMM543HM	H			★	★		★	.625	.250	.047	.250
CNMM544HM	H			★	★		★	.625	.250	.063	.250
CNMM643HM	H			★	★		★	.750	.250	.047	.312
CNMM644HM	H			★	★		★	.750	.250	.063	.312
CNMM646HM	H			★	★		★	.750	.250	.094	.312
CNMM866HM	H			★	★			1.000	.375	.094	.359
CNMM432HL	H			★	★		★	.500	.187	.031	.203
CNMM433HL	H			★	★		★	.500	.187	.047	.203
NEW CNMM434HL	H				★			.500	.187	.063	.203
CNMM543HL	H			★	★		★	.625	.250	.047	.250
CNMM544HL	H			★	★		★	.625	.250	.063	.250
CNMM643HL	H			★	★		★	.750	.250	.047	.312
CNMM644HL	H			★	★		★	.750	.250	.063	.312
CNMM646HL	H			★	★		★	.750	.250	.094	.312
CNMM432HZ	H		●	★	★			.500	.187	.031	.203
CNMM433HZ	H		●	★	★			.500	.187	.047	.203
NEW CNMM434HZ	H				★			.500	.187	.063	.203
CNMM543HZ	H		●					.625	.250	.047	.250
CNMM544HZ	H		●					.625	.250	.063	.250
CNMM643HZ	H		●			★		.750	.250	.047	.312
CNMM644HZ	H		●			★		.750	.250	.063	.312
DNMM432HL	H			★	★		★	.500	.187	.031	.203
DNMM433HL	H			★	★		★	.500	.187	.047	.203
DNMM442HL	H			★	★		★	.500	.250	.031	.203
DNMM443HL	H			★	★		★	.500	.250	.047	.203
DNMM432HZ	H		●	★	★			.500	.187	.031	.203
DNMM433HZ	H		●	★	★			.500	.187	.047	.203
DNMM442HZ	H		●	★	★			.500	.250	.031	.203
DNMM443HZ	H		●	★	★			.500	.250	.047	.203

● : Inventory maintained. ★ : Inventory maintained in Japan.

Negative Inserts (with hole)

M Class



Heavy	Heavy	Heavy	Heavy
HV	HR	HX	HM
			
Heavy	**Heavy**	**Heavy**	**Heavy**
HL	HZ	HL	HZ
			

(inch)

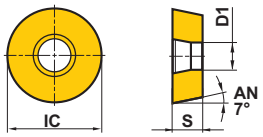
Order Number	Cutting Area	UE6105	UE6110	MC6025	MC6035 (NEW)	UH6400	US735	IC	S	RE	D1
SNMM644HV	H		●	★	★	★		.750	.250	.063	.312
SNMM646HV	H		●	★	★	★		.750	.250	.094	.312
SNMM856HV	H		●	★	★	★		1.000	.313	.094	.359
SNMM866HV	H		●	★	★	★		1.000	.375	.094	.359
SNMM856HR	H			★	★			1.000	.313	.094	.359
SNMM866HR	H			★	★			1.000	.375	.094	.359
SNMM432HX	H			★	★			.500	.187	.031	.203
SNMM433HX	H			★	★			.500	.187	.047	.203
SNMM543HX	H			★	★			.625	.250	.047	.250
SNMM643HX	H		●	★	★	★		.750	.250	.047	.312
SNMM644HX	H		●	★	★	★		.750	.250	.063	.312
SNMM646HX	H		●	★	★	★		.750	.250	.094	.312
SNMM856HX	H		●	★	★	★		1.000	.313	.094	.359
SNMM866HX	H		●	★	★	★		1.000	.375	.094	.359
SNMM543HM	H			★	★		★	.625	.250	.047	.250
SNMM643HM	H			★	★		★	.750	.250	.047	.312
SNMM644HM	H			★	★		★	.750	.250	.063	.312
SNMM646HM	H			★	★		★	.750	.250	.094	.312
SNMM856HM	H			★	★			1.000	.313	.094	.359
SNMM866HM	H			★	★			1.000	.375	.094	.359
SNMM432HL	H			★	★		★	.500	.187	.031	.203
SNMM433HL	H			★	★		★	.500	.187	.047	.203
SNMM543HL	H			★	★		★	.625	.250	.047	.250
SNMM643HL	H			★	★		★	.750	.250	.047	.312
SNMM644HL	H			★	★		★	.750	.250	.063	.312
SNMM646HL	H			★	★		★	.750	.250	.094	.312
SNMM432HZ	H		●	★	★			.500	.187	.031	.203
SNMM433HZ	H		●	★	★			.500	.187	.047	.203
SNMM543HZ	H		●					.625	.250	.047	.250
SNMM643HZ	H		●			★		.750	.250	.047	.312
SNMM644HZ	H		●			★		.750	.250	.063	.312
TNMM332HL	H			★	★		★	.375	.187	.031	.150
TNMM333HL	H			★	★		★	.375	.187	.047	.150
TNMM432HL	H			★	★		★	.500	.187	.031	.203
TNMM433HL	H			★	★		★	.500	.187	.047	.203
TNMM434HL	H			★	★		★	.500	.187	.063	.203
TNMM332HZ	H		★	★	★			.375	.187	.031	.150
TNMM333HZ	H			★	★			.375	.187	.047	.150
TNMM432HZ	H		●					.500	.187	.031	.203
TNMM433HZ	H		●					.500	.187	.047	.203
TNMM434HZ	H		●					.500	.187	.063	.203

7° Positive Inserts (with hole)

M Class

Heavy	Medium
RR	Standard


RCMX



(inch)

Order Number	Cutting Area	UE6105	UE6110	MC6025	MC6035 (NEW)	UH6400	US735	IC	S	RE	D1
RCMX1606M0-RR	H		★	★		★	★	.630	.250	–	.205
RCMX2006M0-RR	H		★	★		★	★	.787	.250	–	.256
RCMX2507M0-RR	H		★	★		★	★	.984	.313	–	.283
RCMX3209M0-RR	H		★					1.260	.375	–	.374
RCMX1003M0	H		●	★			★	.394	.125	–	.142
RCMX1204M0	H	●	●	★			●	.472	.187	–	.165
RCMX1606M0	H	★	●	★		★	★	.630	.250	–	.205
RCMX2006M0	H	★	●	★		★	★	.787	.250	–	.256
RCMX2507M0	H	★	★	★				.984	.313	–	.283
RCMX3209M0	H	★	★					1.260	.375	–	.374

● : Inventory maintained. ★ : Inventory maintained in Japan.

Memo

Chip Breaker System for Heavy Cutting

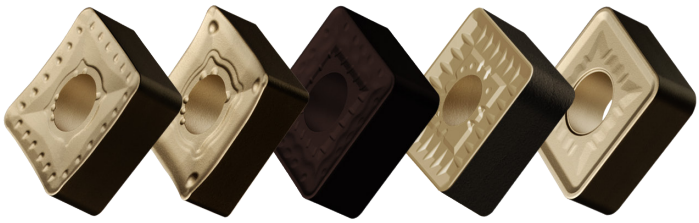
Recommended Cutting Conditions

(inch)

Work Material		Hardness	Cutting Conditions	Grade	Breaker	vc (SFM)	f (IPR)	ap
P	Carbon Steel and Alloy Steel	180-280 HB	Stable Cutting	UE6110	HX	540—920	.020—.050	.118—.433
					HV	440—755	.028—.051	.157—.472
					HZ	540—920	.016—.047	.079—.394
					HL	540—920	.016—.039	.059—.315
					HM	540—920	.020—.043	.079—.394
			General Cutting	MC6025	HX	540—870	.020—.050	.118—.433
					HV	440—720	.028—.051	.157—.472
					HZ	540—870	.016—.047	.079—.394
					HL	540—870	.016—.039	.059—.315
					HM	540—870	.020—.043	.079—.394
					HR	440—720	.028—.051	.118—.472
				UE6110	HZ	540—920	.016—.047	.079—.394
			Unstable Cutting	MC6035	HX	460—655	.020—.050	.118—.433
					HV	375—540	.028—.051	.157—.472
					HZ	460—655	.016—.047	.079—.394
					HL	460—655	.016—.039	.059—.315
					HM	460—655	.020—.043	.079—.394
					HR	375—540	.028—.051	.118—.472
				UH6400	HX	460—640	.020—.050	.118—.433
					HV	375—525	.028—.051	.157—.472
					HZ	460—640	.016—.047	.079—.394

(inch)

	Work Material	Hardness	Cutting Conditions	Grade	Breaker	vc (SFM)	f (IPR)	ap
M	Austenitic Stainless Steel	≤ 200 HB	Stable Cutting	US735	HL	245—460	.016—.039	.059—.315
			General Cutting	US735	HL	245—460	.016—.039	.059—.315
					HM	245—460	.020—.043	.079—.394
			Unstable Cutting	US735	HL	245—460	.016—.039	.059—.315
					HM	245—460	.020—.043	.079—.394
	Austenitic Stainless Steel	> 200 HB	Stable Cutting	US735	HL	195—395	.157—.039	.059—.315
					HM	195—395	.020—.043	.079—.394
			General Cutting	US735	HL	195—395	.016—.039	.059—.315
					HM	195—395	.020—.043	.079—.394
			Unstable Cutting	US735	HL	195—395	.016—.039	.059—.315
					HM	195—395	.020—.043	.079—.394
	Duplex Stainless Steel	≤ 280 HB	Stable Cutting	US735	HL	165—310	.016—.039	.059—.315
					HM	165—310	.020—.043	.079—.394
			General Cutting	US735	HL	165—310	.016—.039	.059—.315
					HM	165—310	.020—.043	.079—.394
			Unstable Cutting	US735	HL	165—310	.016—.039	.059—.315
					HM	165—310	.020—.043	.079—.394
	Ferritic or Martensitic Stainless Steels	≤ 200 HB	Stable Cutting	US735	HL	245—460	.016—.039	.059—.315
					HM	245—460	.020—.043	.079—.394
			General Cutting	US735	HL	245—460	.016—.039	.059—.315
					HM	245—460	.020—.043	.079—.394
			Unstable Cutting	US735	HL	245—460	.016—.039	.059—.315
					HM	245—460	.020—.043	.079—.394
	Ferritic or Martensitic Stainless Steels	> 200 HB	Stable Cutting	US735	HL	195—395	.016—.039	.059—.315
					HM	195—395	.020—.043	.079—.394
			General Cutting	US735	HL	195—395	.016—.039	.059—.315
					HM	195—395	.020—.043	.079—.394
			Unstable Cutting	US735	HL	195—395	.016—.039	.059—.315
					HM	195—395	.020—.043	.079—.394
	Precipitation Hardening Stainless	< 450 HB	Stable Cutting	US735	HL	130—260	.016—.039	.059—.315
					HM	130—260	.020—.043	.079—.394
			General Cutting	US735	HL	130—260	.016—.039	.059—.315
					HM	130—260	.020—.043	.079—.394
			Unstable Cutting	US735	HL	130—260	.016—.039	.059—.315
					HM	130—260	.020—.043	.079—.394



Chip Breaker System for Heavy Cutting

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

MITSUBISHI MATERIALS CORPORATION

EXP-14-E002
Printed in U.S.A. 2/17