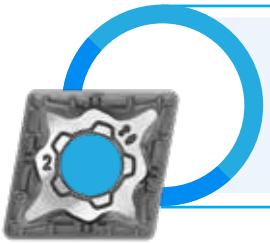

P M S
TURNING CHIPFORMERS
Member IMC Group
ISCAR
www.iscar.com

General Information

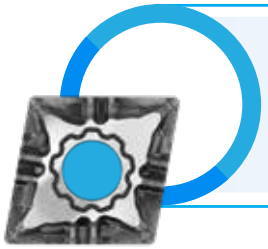
R3P

Roughing Range Definition
a_p=4-12mm
F=0.4-1.2mm/rev



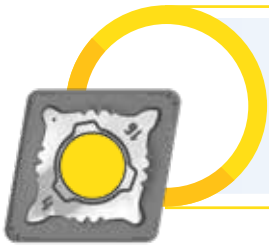
M3P

Medium Range Definition
a_p=0.5-6mm
F=0.15-0.6mm/rev



F3P

Finishing Range Definition
a_p=0.3-2.5mm
F=0.05-0.3mm/rev



R3M

Roughing Range Definition
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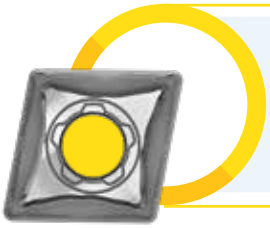

M3M

Medium Range Definition
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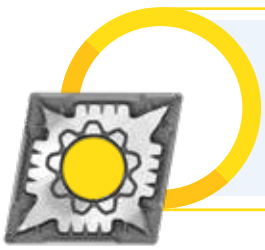
F=0.15-0.6mm/rev



F3M

Finishing Range Definition
a_p=0.3-2.5mm
F=0.05-0.3mm/rev

F3S

Finishing Range Definition
a_p=0.3-2.5mm
F=0.05-0.3mm/rev

Key Code

The new chipformer code key consists of three characters (and an optional fourth character).
For example: CNMG 120408-M3P

1. Application			
		Feed (mm/rev)	a_p (mm)
F	Finishing	0.08-0.20	0.30-1.50
M	Medium	0.15-0.45	0.70-4.50
R	Roughing	0.35-0.70	3.00-7.00
H	Heavy Roughing	0.60-1.50	6.00-20.0

2. Chip Load	
2	For special cases
3	General recommendation for all applications
4	For special cases

ISO Standard Designation					1	2	3	4
CNMG	12	04	08	-	M	3	P	W

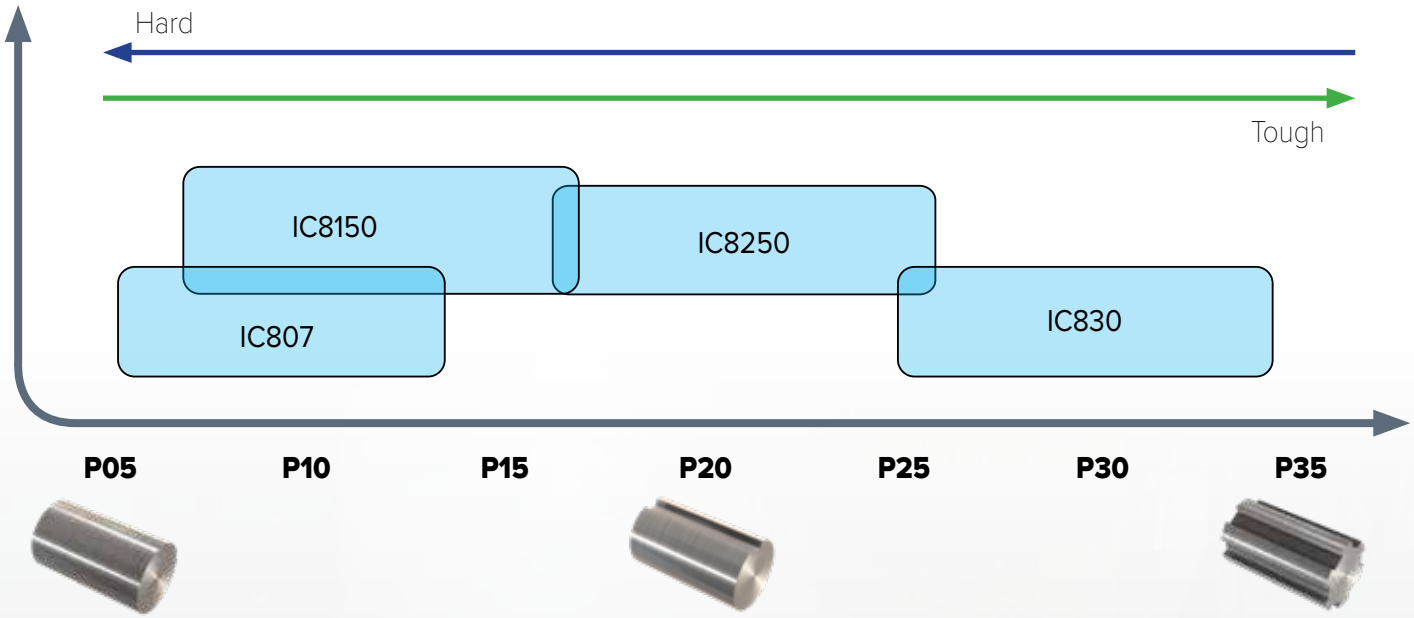
3. Workpiece Material Group	
P	Steel
M	Stainless Steel
K	Cast Iron
N	Nonferrous & Aluminum
S	High Temperature Alloys
H	Hardened Steel

4. Wiper Geometry	
	Without wiper
W	Wiper Geometry

VIDEO VIDEO

Grades

Recommended Carbide Grades



Machining Data and Speed Recommendations for Turning

ISO	Material		Condition	Tensile Strength Rm [N/mm²=MPa]	Hardness HB	Material Group No.	Carbide + PVD		Carbide + CVD	
							IC830	IC807	IC8250	IC8150
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1	120-200	140-230	230-380	280-420
		>= 0.25 %C	Annealed	650	190	2	100-170	12 0-205	200-340	240-380
		< 0.55 %C	Quench and temper	850	250	3	80-150	100-180	170-300	200-340
		>= 0.55 %C	Annealed	750	220	4	90-160	115-190	190-320	220-360
			Quench and temper	1000	300	5	80-130	95-170	160-280	180-320
	Low alloy steel and cast steel (less than 5% all element)		Annealed	600	200	6	80-150	100-180	170-300	200-340
				930	275	7	70-130	95-170	160-280	200-320
			Quench and tempered	1000	300	8	60-120	85-150	140-250	190-300
				1200	350	9	50-100	70-130	120-220	180-280
	High alloyed steel, cast steel and tool steel		Annealed	680	200	10	80-130	100-170	170-280	200-320
			Quench and temper	1100	325	11	50-100	70-30	120-220	180-280
			Ferritic/martensitic	680	200	12	90-160		190-320	220-360
			Martensitic	820	240	13	80-150		170-300	240-380

ISCAR Turning Grades Chart

Grade	ISO	Grade Description	Coating Layers	Coating Color*
IC8150	P10-P25 M10-M20 K10-K25	A hard substrate with a cobalt enriched layer, MTCVD coating with a special SUMOTEC surface treatment. Recommended for high speed machining of steels, alloy steels and martensitic stainless steel with moderate feeds under stable conditions. Features excellent thermal stability, resistance to wear and plastic deformation durability.	TiN Al_2O_3 TiCN Base	
IC8250	P15-P35 M15-M25	A tough substrate with a cobalt enriched layer and MTCVD coating with a special SUMOTEC surface treatment. Recommended for machining steels, alloy steels and martensitic stainless steel under diverse conditions. Features high toughness and good wear resistance.	TiN Al_2O_3 TiCN Base	
IC830	P30-P45 M25-M40 S20-S30	A tough substrate with PVD coating and a special SUMOTEC surface treatment. Suitable for machining steel and stainless steel at low to medium cutting speeds and moderate to high feeds. The grade features high toughness and recommended for interrupted cuts and machining under unstable conditions. May be used on high temperature alloys at low cutting speeds.	TiN TiAlN Base	
IC807	P10-P20 M05-M15 K15-K30 S10-S20 H05-H15	A hard submicron grain size substrate with PVD coating and a special SUMOTEC surface treatment. Suitable for machining steels, alloy steels, austenitic stainless steel, high temperature alloys and hard steels at moderate to relatively high cutting speeds under stable conditions. Features high wear resistance and plastic deformation durability.	TiN TiAlN Base	

Chipformers

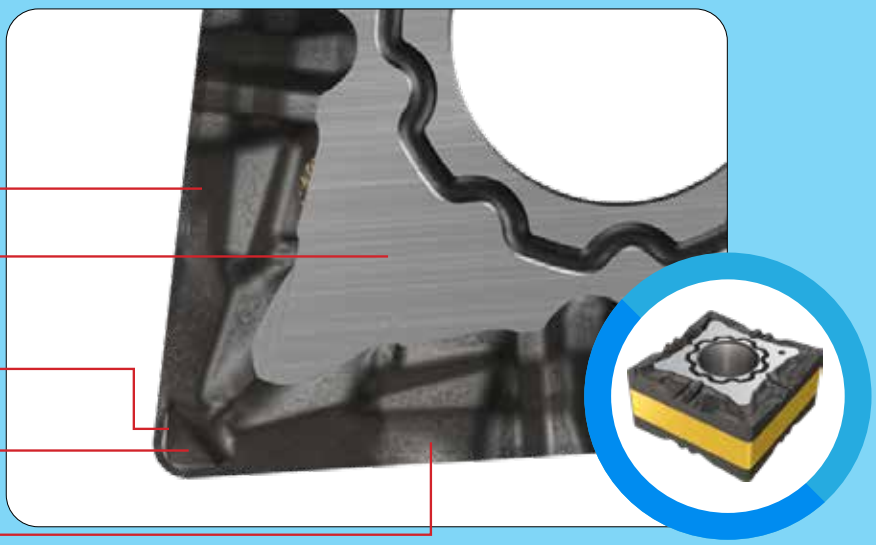
R3P

- Low cutting resistance due to positive rake geometry
- Reinforced cutting edge with a negative land
- Unique deflector geometry for improved chip control

M3P

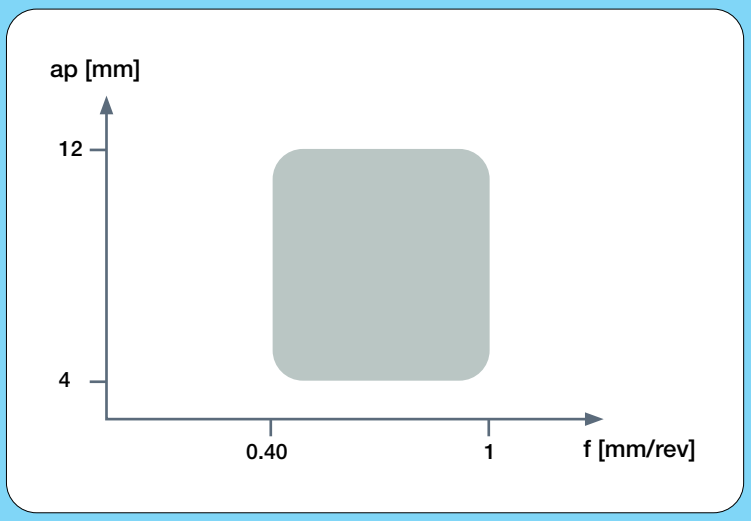
- Unique deflector geometry for improved chip control
- Ground surface for high rigidity and better accuracy
- Unique deflector design for chip control at low cutting conditions
- Wavy surface to prevent chip hammering

F3P

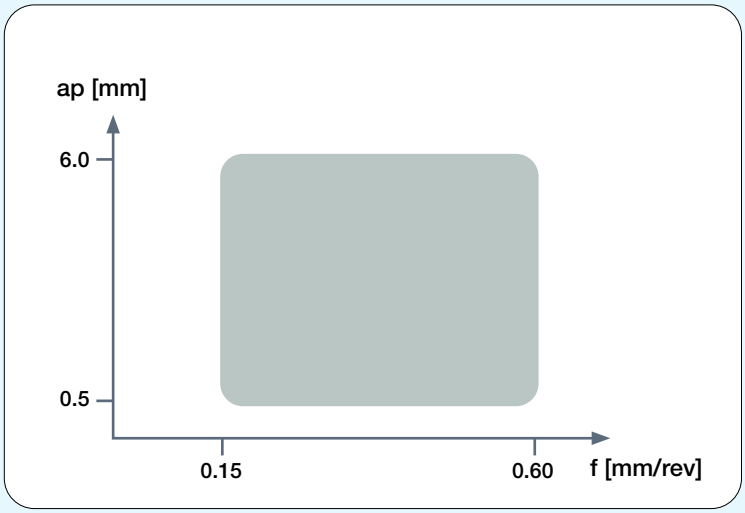


- Unique deflector design
- Ground surface for improved immovability and better rigidity
- Unique deflector design for chip control at low cutting conditions
- Positive rake angle for smooth cutting and reduced cutting forces
- Wavy surface to prevent chip hammering

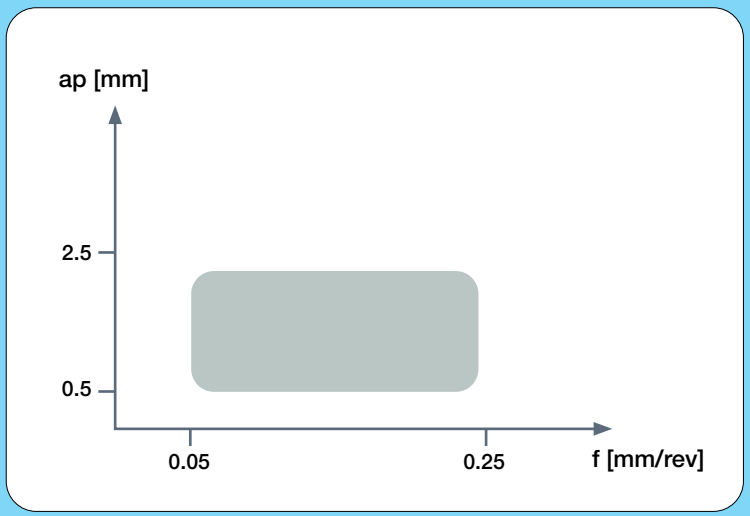
Chipbreaker for rough machining of steel with reinforced cutting edge. Positive rake angle to reduce cutting forces and for smooth cutting. The machining application range is 4.0-12 mm D.O.C. and 0.4-1.0 mm/rev



Chipbreaker for medium machining of steel with reinforced cutting edge. Positive rake angle to reduce cutting forces and for smooth cutting. The machining application range is 0.5-6 mm D.O.C. and 0.15-0.60 mm/rev

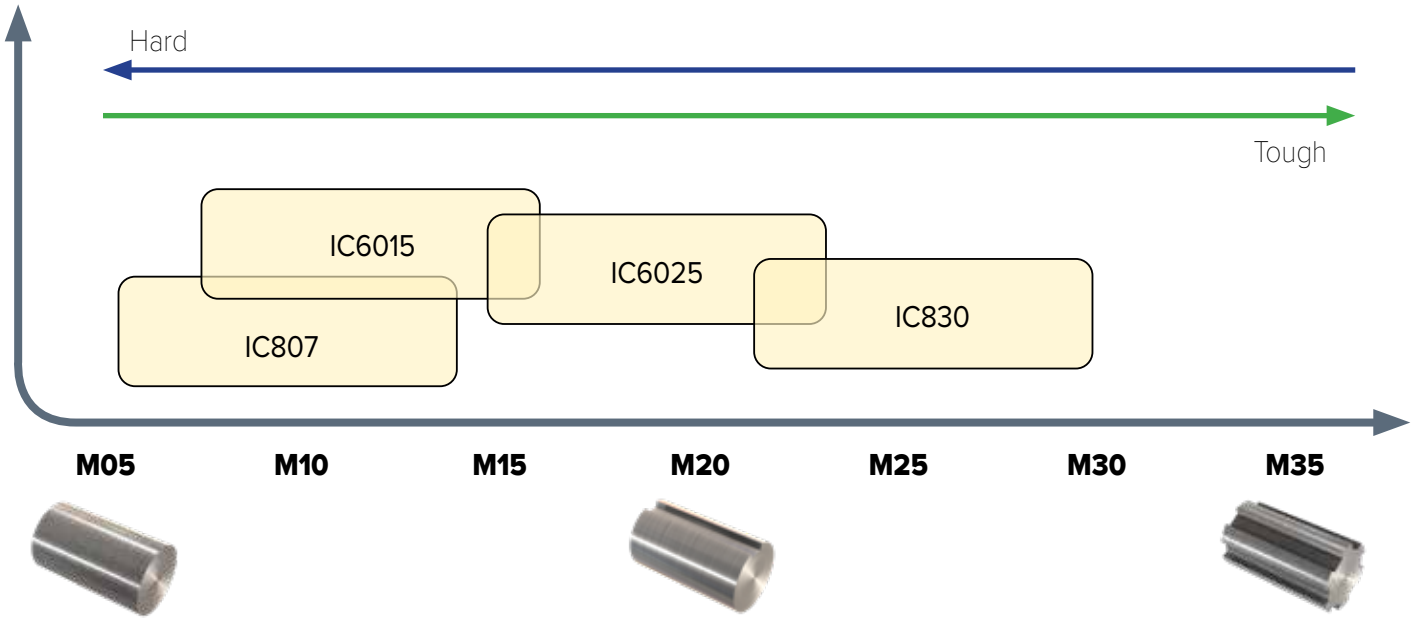


The F3P chipbreaker has positive rake angles for smooth cutting, reduced cutting forces and insert wear, leading to dramatically increased tool life. The machining application area is 0.40 - 2.0 mm D.O.C. and 0.05 - 0.25 mm/rev feed.



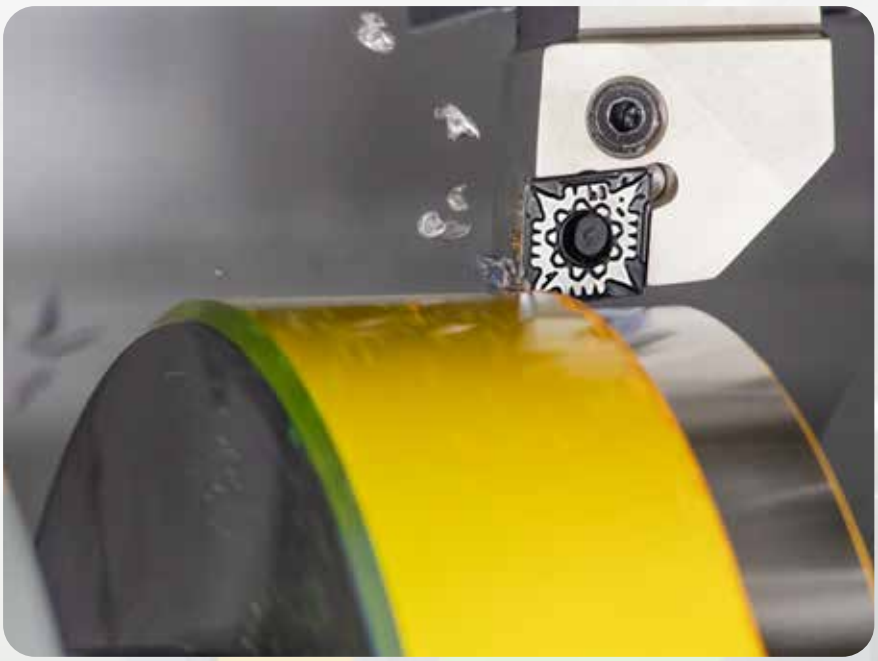
Grades

Recommended Carbide Grades



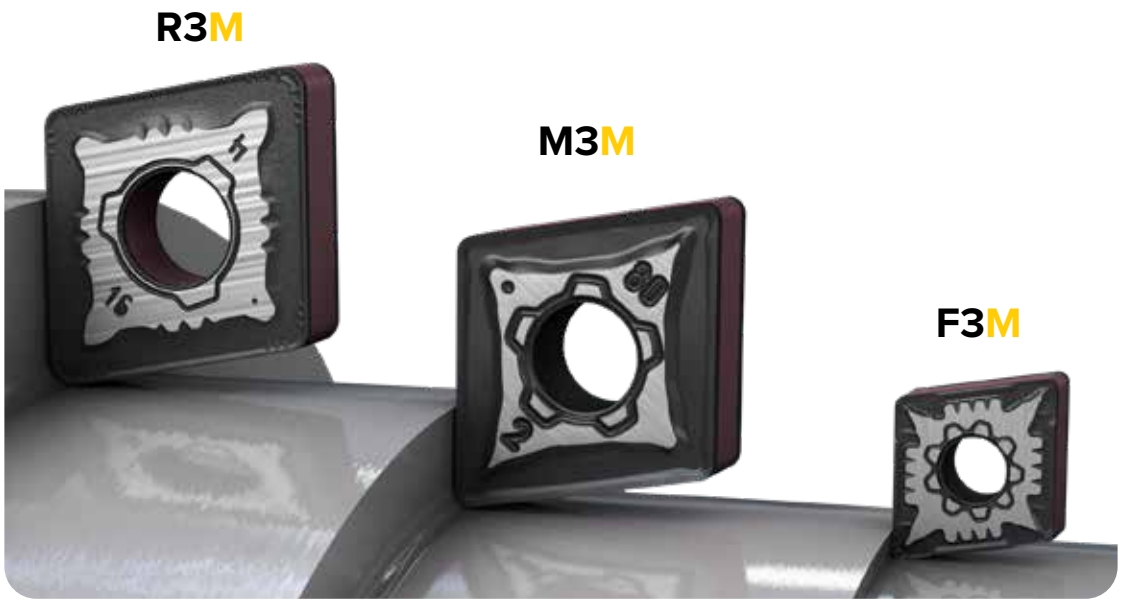
Machining Data and Speed Recommendations for Turning

ISO	Material	Condition	Tensile Strength Rm [N/mm²=MPa]	Hardness HB	Material No.	Carbide + PVD		Carbide + CVD	
						IC807	IC830	IC6015	IC6025
M	Stainless steel	Austenitic	600	180	14	100-200	50-120	140-250	120-180



ISCAR Turning Grades Chart

Grade	ISO	Grade Description	Coating Layers	Coating Color*
IC6015	M05-M25 S10-S20	A hard substrate with cobalt enriched outer layer and MTCVD coating and a special SUMOTEC surface treatment. Suitable for finishing and medium turning of stainless steel at high cutting speeds. Features long tool life and high wear resistance.	TiN Al_2O_3 TiCN Base	
IC6025	M15-M35 S20-S30	A very tough substrate with MTCVD coating with a special SUMOTEC surface treatment. Recommended for machining stainless steel at moderate cutting speeds and medium to high feeds. Features very high toughness with excellent results for heavy machining operations, unstable conditions, and interrupted cut.	TiN Al_2O_3 TiCN Base	
IC830	P30-P45 M25-M40 S20-S30	A tough substrate with PVD coating and a special SUMOTEC surface treatment. Suitable for machining steel and stainless steel at low to medium cutting speeds and moderate to high feeds. The grade features high toughness and recommended for interrupted cuts and machining under unstable conditions. May be used on high temperature alloys at low cutting speeds.	TiN TiAlN Base	
IC807	P10-P20 M05-M15 K15-K30 S10-S20 H05-H15	A hard submicron grain size substrate with PVD coating and a special SUMOTEC surface treatment. Suitable for machining steels, alloy steels, austenitic stainless steel, high temperature alloys and hard steels at moderate to relatively high cutting speeds under stable conditions. Features high wear resistance and plastic deformation durability.	TiN TiAlN Base	

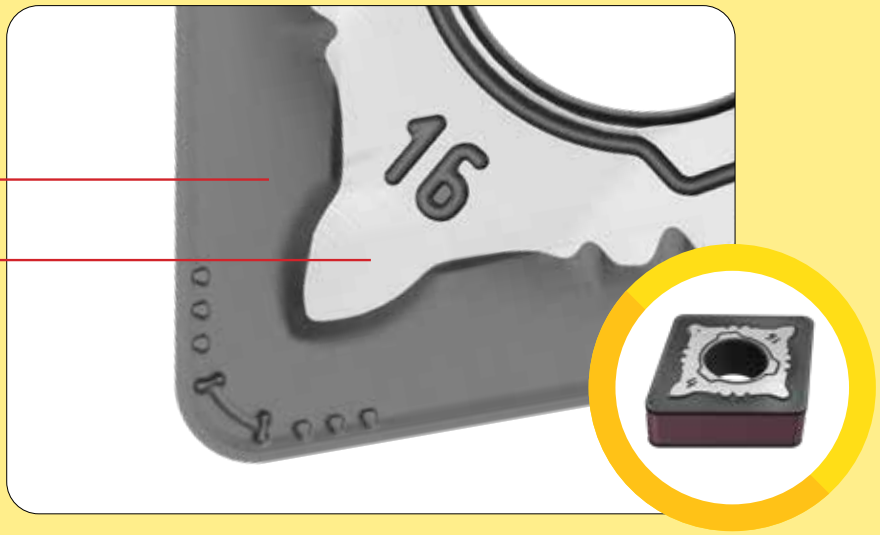


Chipformers

R3M

Unique deflector geometry
For improved chip control

Ground surface for high
rigidity and better accuracy



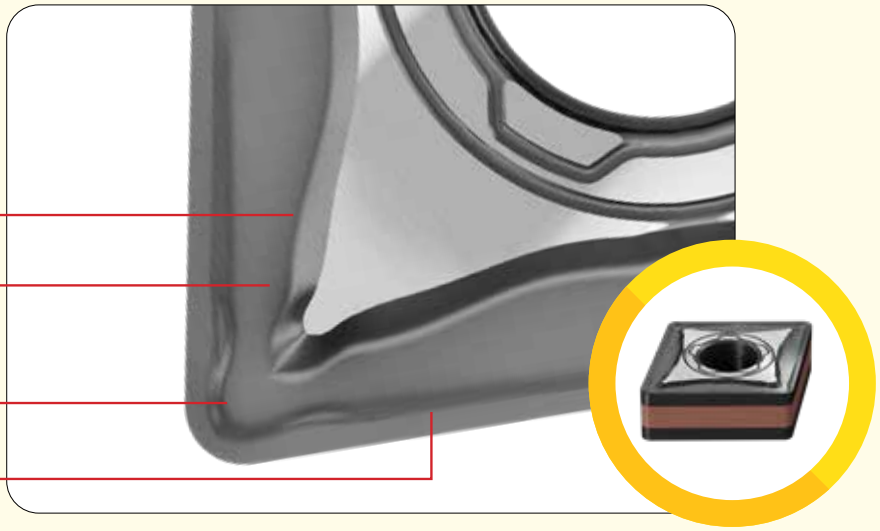
M3M

Unique deflector design

Reinforced cutting edge
prevents notch wear

Tight stronge radius

Positive rake angle for smooth
cutting and reducing cutting forces

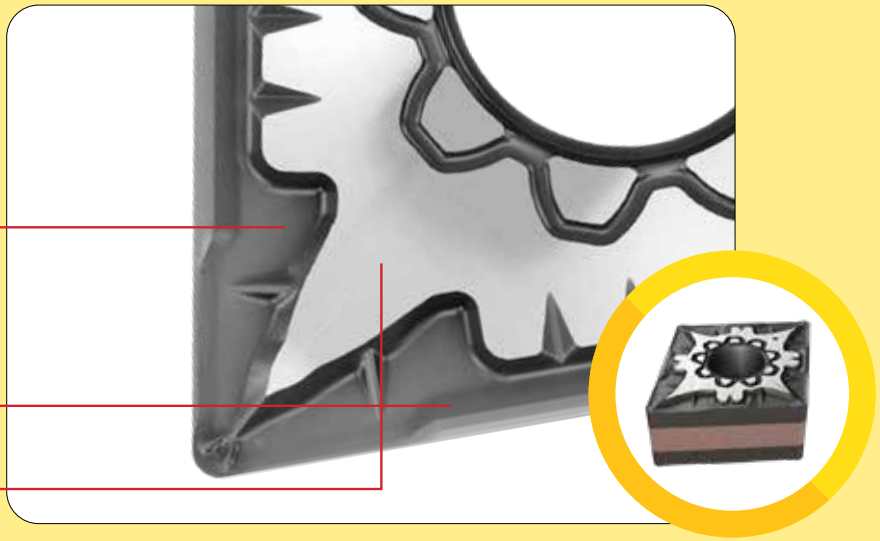


F3M

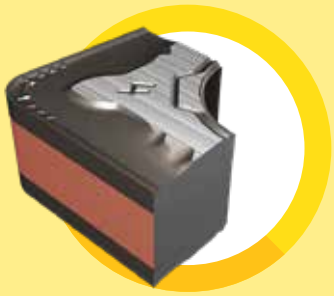
Unique deflector geometry
for improved chip control

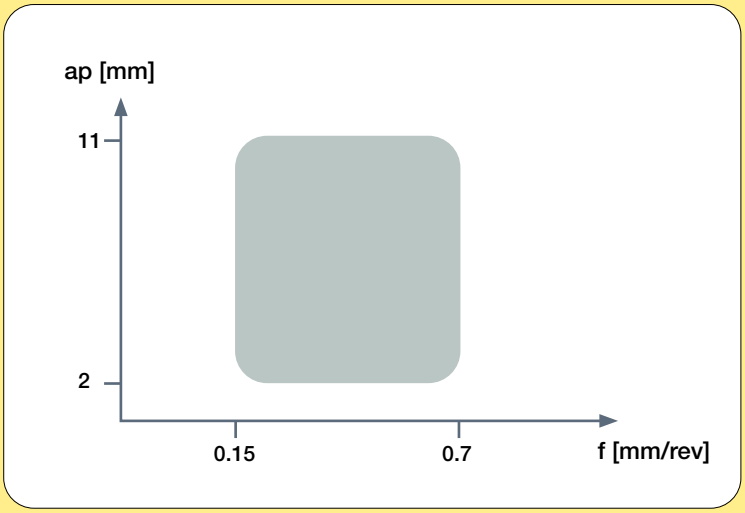
Wavy surface to prevent
chip hammering

Ground surface for high rigidity
and better accuracy

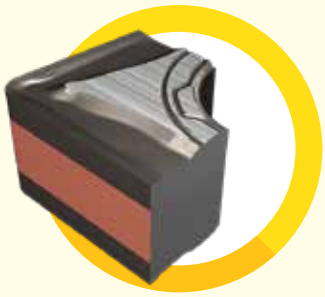


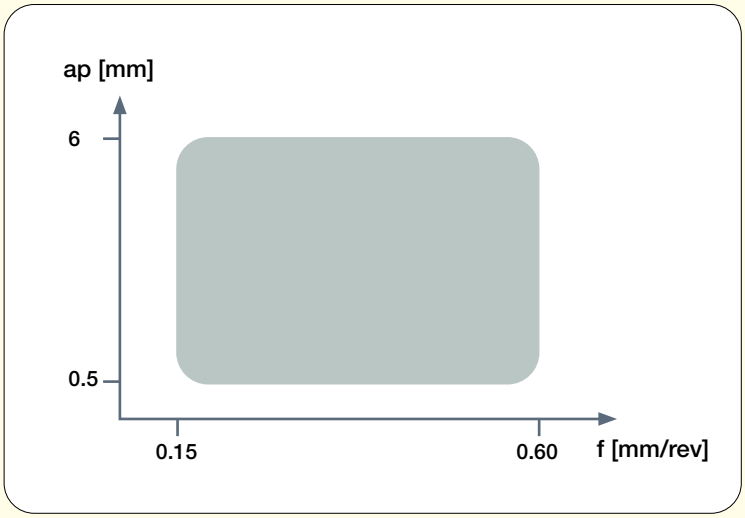
Chipbreaker for rough machining of stainless steel with reinforced cutting edge. Positive rake angle to reduce cutting forces and for smooth cutting.
The machining application range is 2-11 mm D.O.C and 0.15-0.7 mm/rev.



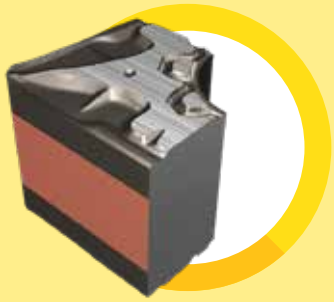


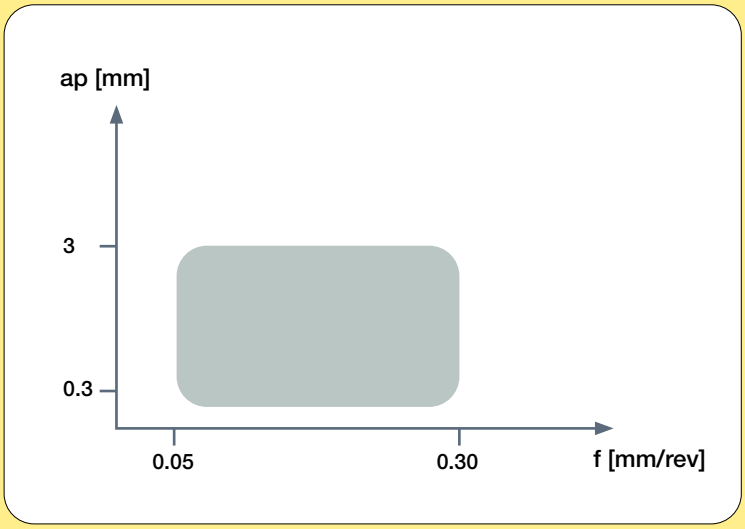
Chipbreaker for medium machining of stainless steel with reinforced cutting edge. Positive rake angle to reduce cutting forces and for smooth cutting.
The machining application range is 0.5-6 mm D.O.C and 0.15-0.6 mm/rev.





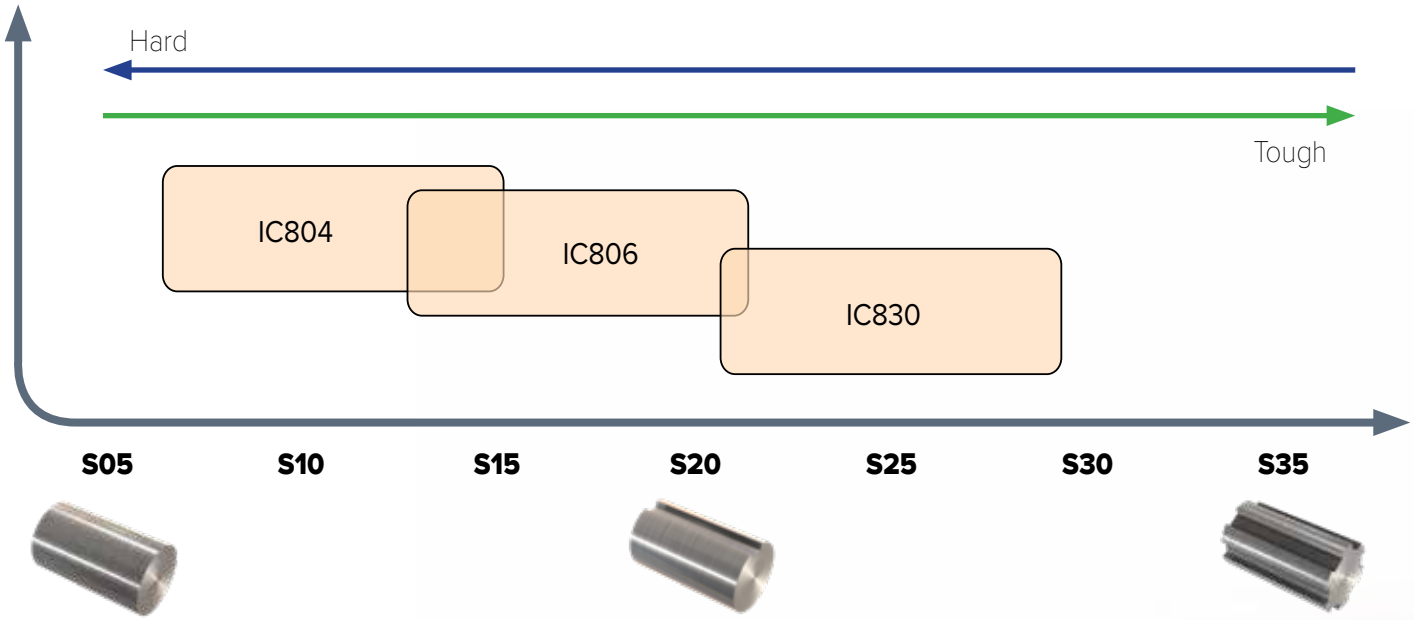
The F3M chipbreaker has positive rake angles for smooth cutting, reduced cutting forces and insert wear, leading to dramatically increased tool life.
The machining application area is 0.3-3 mm D.O.C and 0.05-0.3 mm/rev feed.





Grades

Recommended Carbide Grades



Machining Data and Speed Recommendations for Turning

ISO	Material		Condition	Tensile Strength Rm [N/mm²=MPa]	Hardness HB	Material No.	Carbide + PVD		
							IC804	IC806	IC830
S	High temp. alloys	Fe based	Annealed		200	31			30-40
			Cured		280	32			20-30
	Super alloys	Ni or Co based	Annealed		250	33	65 - 105	50-80	20-25
			Cured		350	34	50 - 90	40-70	10-20
			Cast		320	35	40 - 85	30-65	15-25
	Titanium Ti alloys			Rm 400		36			130-160
			Alpha+beta alloys cured	Rm 1050		37			30-60

ISCAR Turning Grades Chart

Grade	ISO	Grade Description	Coating Layers	Coating Color*
IC804	S05-S15	A very hard submicron grain size substrate with PVD coating and a special SUMOTEC surface treatment. Suitable for semi-finishing and finishing operations under stable conditions on high temperature alloys and Titanium alloys moderate to relatively high cutting speeds. Features high wear resistance and plastic deformation durability.	TiAlN AlTiN Base	
IC806	M05-M15 S10-S20	A hard submicron grain size substrate with PVD coating and a special SUMOTEC surface treatment. Excellent for machining high temperature alloys and Titanium alloys, at moderate to relatively high cutting speeds. Features high wear resistance and plastic deformation durability.	TiAlN AlTiN Base	
IC830	P30-P45 M25-M40 S20-S30	A tough substrate with PVD coating and a special SUMOTEC surface treatment. Suitable for machining steel and stainless steel at low to medium cutting speeds and moderate to high feeds. The grade features high toughness and recommended for interrupted cuts and machining under unstable conditions. May be used on high temperature alloys at low cutting speeds.	TiN TiAlN Base	

Chipformer

F3S

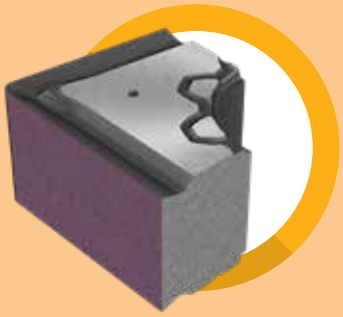
Ground surface for improved immovability and better rigidity

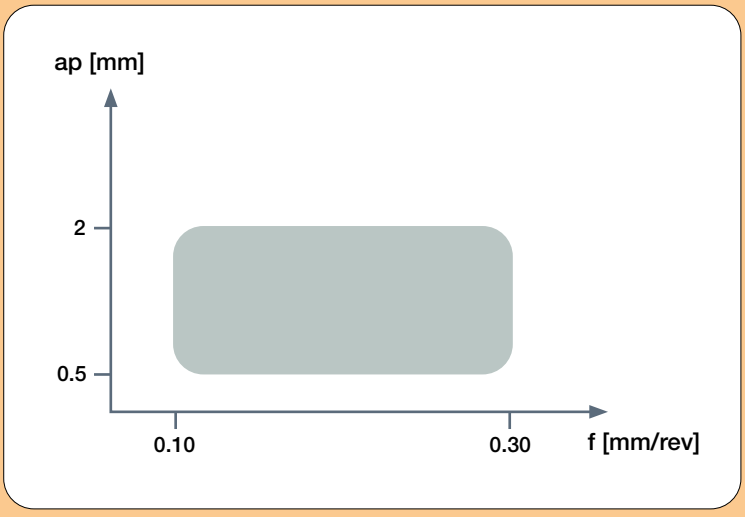
Positive rake angle for smooth and easy cut

Unique deflector design for efficient chip control at low feed and D.O.C.

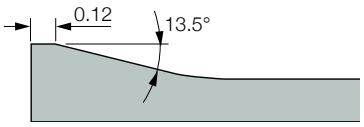
Reinforced cutting edge to prevent VG wear

The F3S chipformer delivers very efficient chip breaking results at 0.5-2 D.O.C and 0.1-0.3 mm/rev feed range.





R3P



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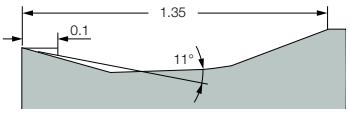
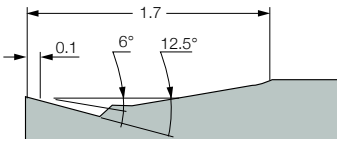
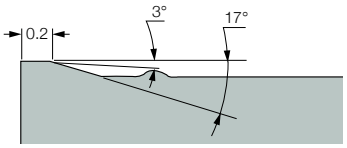


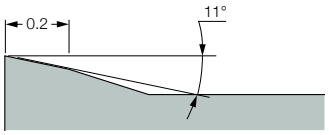
F3P

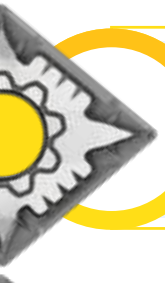


R3M

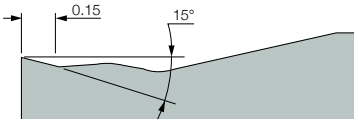


M3M

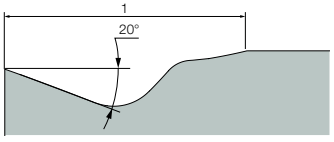




F3M



F3S



Chipbreaker for rough machining on steel with a positive rake angle and reinforced cutting edge for better performance and longer tool life.

Double-sided insert for medium machining on steel with a reinforced cutting edge to increase tool life.

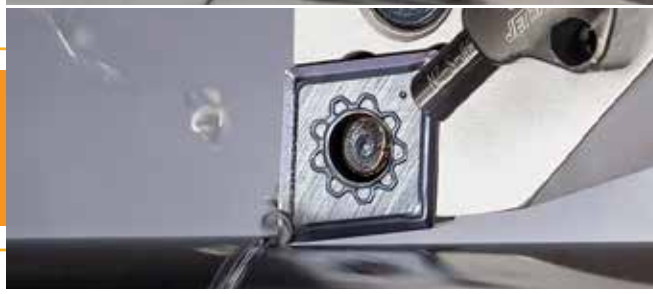
Double-sided insert with a positive rake angle to reduce cutting forces for finish machining on steel.

Double-sided insert for rough machining on stainless steel with a unique deflector geometry to improve chip control. Includes a wavy surface to prevent chip hammering.

Double-sided insert for medium machining on stainless steel with a reinforced cutting edge that prevents notch wear on its corner radius for increased tool life.

Double-sided insert with a positive rake angle for finish machining on stainless steel. Its unique deflector geometry with a wavy surface prevents chip hammering.

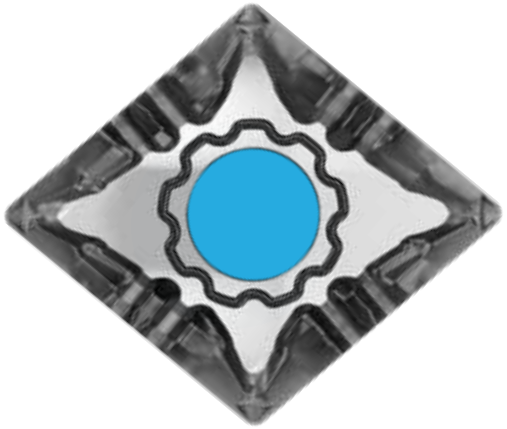
Chipbreaker with positive rake angle for finish machining superalloys and exotic materials.



P

M

S



The Best is Now
BETTER

TRY ME
ON STEEL

CNMG **120404-F3P** IC8150

CNMG **120408-F3P** IC8250

F3P Machining Range:
a_p=0.4-2mm
F=0.05-0.25mm/rev

The Best is Now
BETTER

TRY ME
ON STAINLESS STEEL

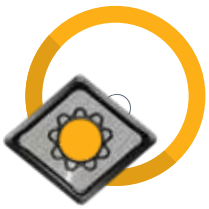
CNMG **120404-F3M** IC6015

CNMG **120408-F3M** IC6025

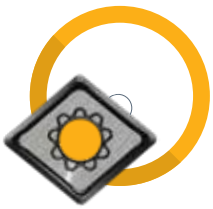
F3M Machining Range:
a_p=0.3-3mm
F=0.05-0.3mm/rev

The Best is Now
BETTER

TRY ME
ON NICKEL BASE MATERIALS



CNMG **120404-F3S** IC804



CNMG **120404-F3S** IC806

F3S Machining Range:
a_p=0.5-2mm
F=0.1-0.3mm/rev

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