CONTENTS

Added products

Member IMC Group Tungaloy INDUSTRY 4.0

Member IMC Group Tungaloy INDUSTRY 4.0

TurnLine

ISO-EcoTurn

Tungaloy Report No. 426-US

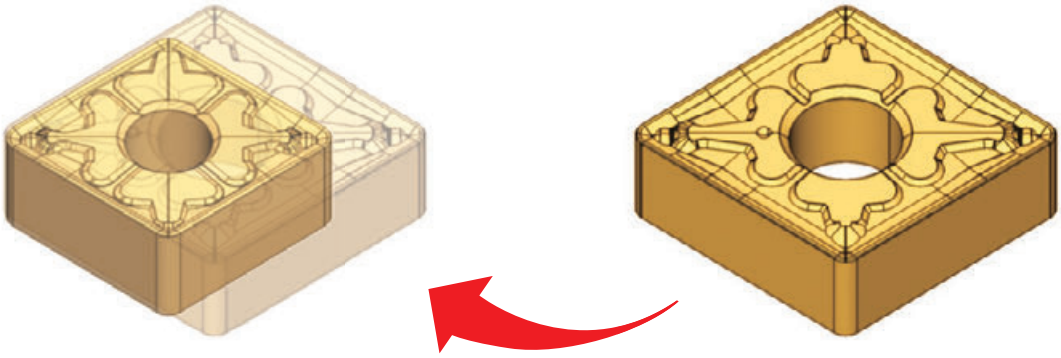
Cartridge Set allows the use of ISO-EcoTurn insert with **no need to swap** the toolholder

TUNGALOY ADDFORCE ACCELERATED LINES

INDUSTRY 4.0
FEED the SPEED!

TUNGALOY ADDFORCE TURN
ACCELERATED TURNING & THREADING

ISOEcoTURN



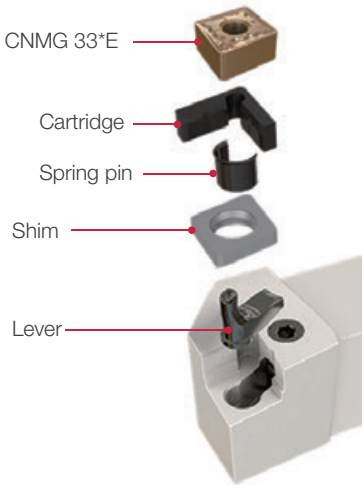
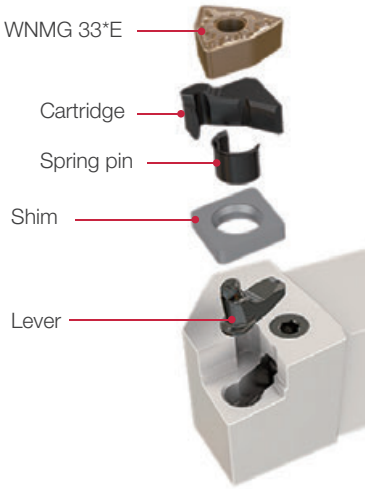
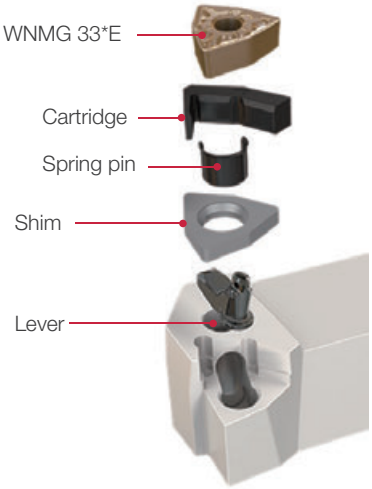
ISOEcoTURN
CNMG 332E type

Regular size inserts
CNMG 432 type

Cost effective:
Identical cutting performance, just a smaller size

ISO-EcoTurn small sized inserts, offer an economical advantage

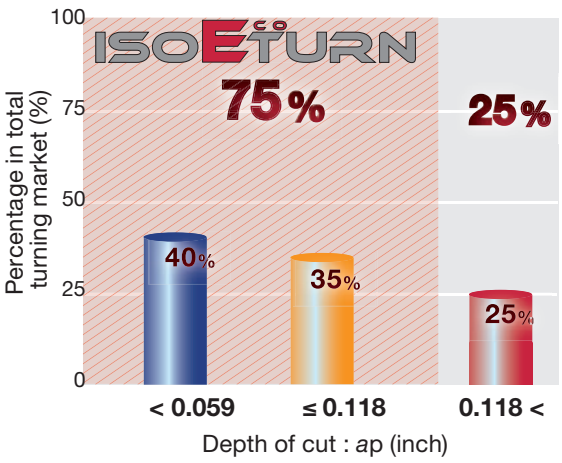
Cartridge Set allows more flexibility with use of ISO-EcoTurn inserts and lever-lock holders. This increases the ability to maximize potential cost efficiency and productivity

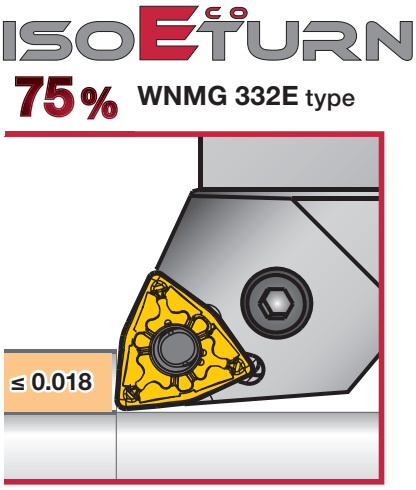
Applicable combination	CNMG 43… ↓ ISO-EcoTurn CNMG 33*E	CNMG 43… ↓ ISO-EcoTurn WNMG 33*E	WNMG 43… ↓ ISO-EcoTurn WNMG 33*E
Cartridge Set + ISO-EcoTurn Insert			
Detail of Cartridge Set			
Cartridge Set	**AD-CL-4/3-SET** **AD-CL-4/3-SET-S**	**AD-CL-4/3-W-SET**	**AD-WL-4/3-SET**
Applicable Tool holder	**PCLNR/L**4**	**PCLNR/L**4**	**PWLNR/L**4**

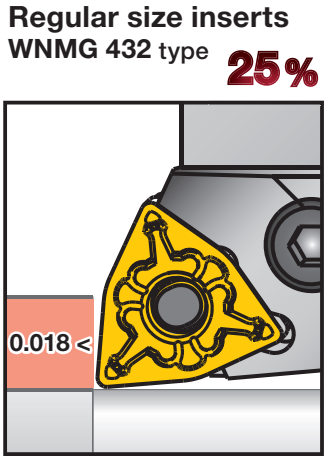
Note: How to install the cartridge set page 11. Cartridge set cannot be assembled on Tungaloy's P-style holders.
This product might correspond to the Export Trade Control Order.
When you export this product, you might need apply for export licenses to the authorities in your country.

Over 75%* of the turning market only uses a depth of cut at or less than 0.118"

* Based on Tungaloy market research.





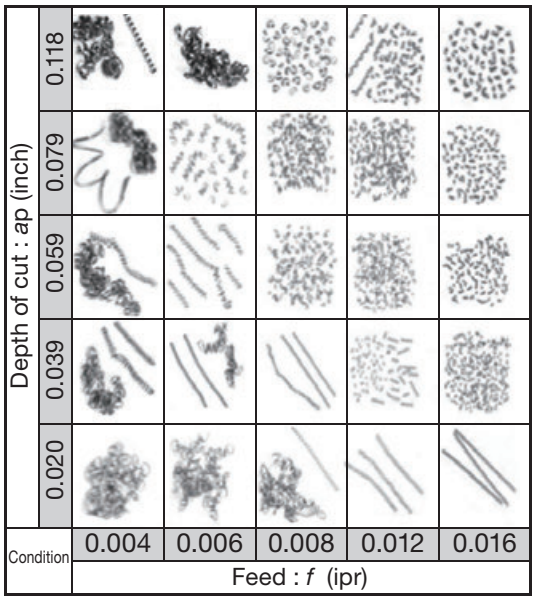


Chip control

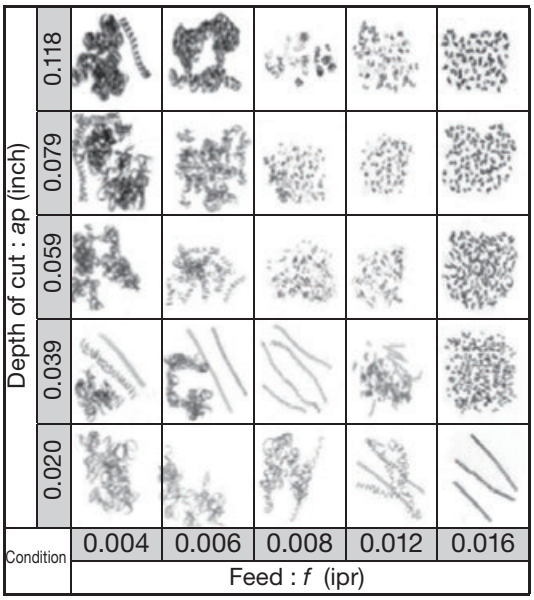
ISO-EcoTurn inserts incorporate an identical chipbreaker geometry as regular size inserts providing the same chip removal at a depth of cut up to 0.118"m.

Workpiece : 1045
Cutting speed : *Vc* = 656 sfm
Coolant : Wet

ISO-EcoTurn
CNMG 332E TM

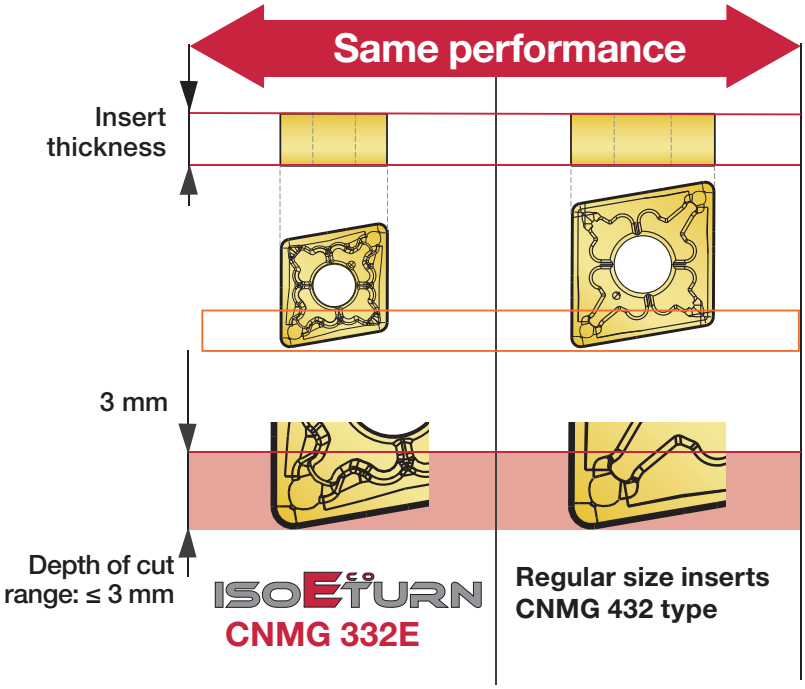


Regular size inserts
CNMG 432 TM



Uncompromising insert performance

- Comparison of ISO-EcoTurn and regular sized inserts

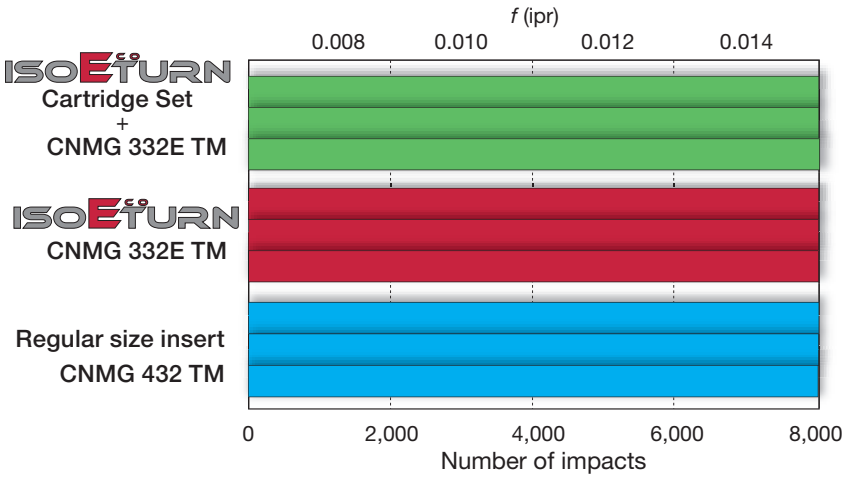


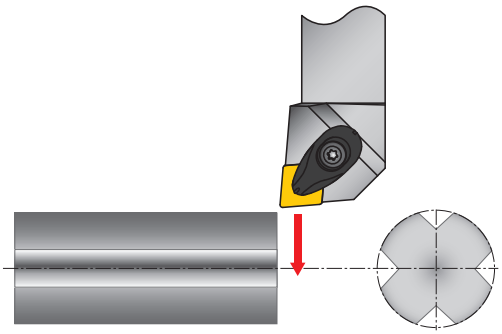
ISO-EcoTurn inserts feature the identical thickness and chipbreaker geometry as Tungaloy's regular size inserts.

These properties provide cutting performance equal to that of the regular size inserts, including chip control at a depth of cut up to 0.018".

Fracture resistance

- Even used Cartridge Set ISO-Eco Turn inserts preserve the thickness of standard inserts in order to maintain fracture resistance.



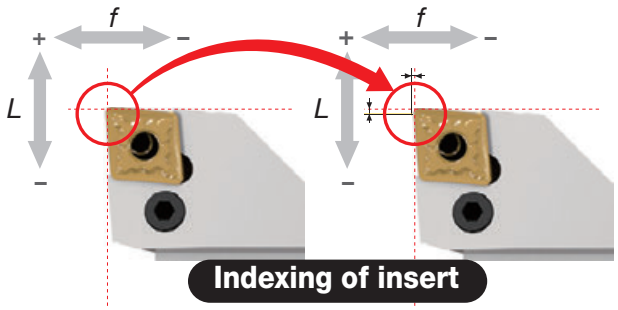


Workpiece : 1045
Cutting speed : *Vc* = 492 sfm
Feed : *f* = 0.008 - 0.014 ipr
Depth of cut : *a*p = 0.118"
Work process : Face turning (Interrupted)
Coolant : Wet

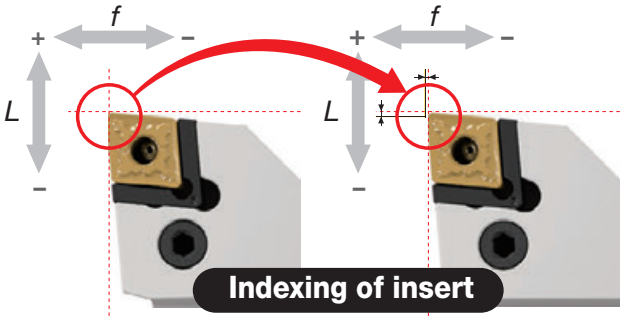
A complete tooling solution is now available with ISO-EcoTurn

For a wide range of turning applications.

Indexing accuracy



Type A



Type B

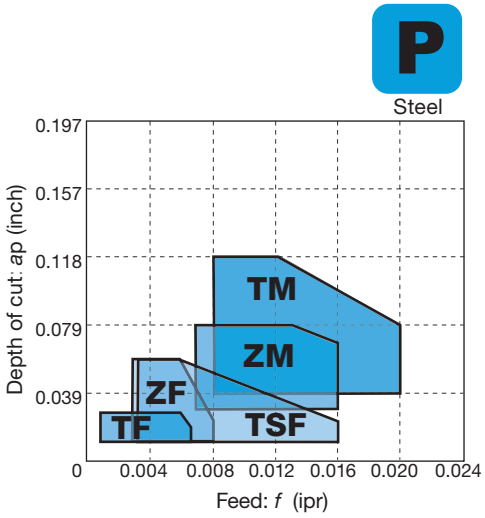
	Type	Tool holder	Insert	Cartridge Set	*f* direction (µm)	*L* direction (µm)
A:	ISOECOTURN	PCLNR**33	CNMG 333E TM	-	1	2
B:	ISOECOTURN + Cartridge Set	PCLNR**4	CNMG 333E TM	AD-CL-4/3-SET	1.7	2.5
C:	Competitor P-type tool holder	PCLNR**4	CNMG 433 TM	-	2	4

GRADES & CHIPBREAKERS

T9200 SERIES (CVD)

PREMIUMTEC TUNGALOY

T9205 : Good wear resistance
T9215 : First choice for machining steel
T9225 : Grade with a good balance of wear resistance and fracture toughness

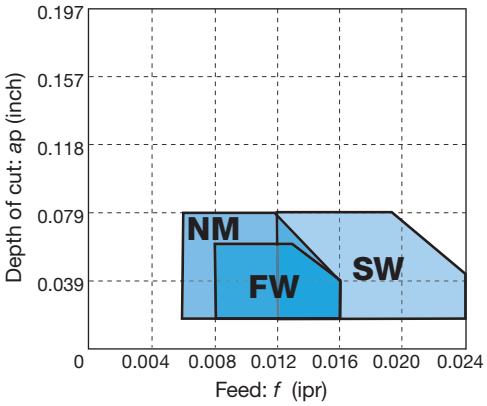


NS9530 & GT9530

(Cermet) **(Coated cermet)**

PREMIUMTEC TUNGALOY

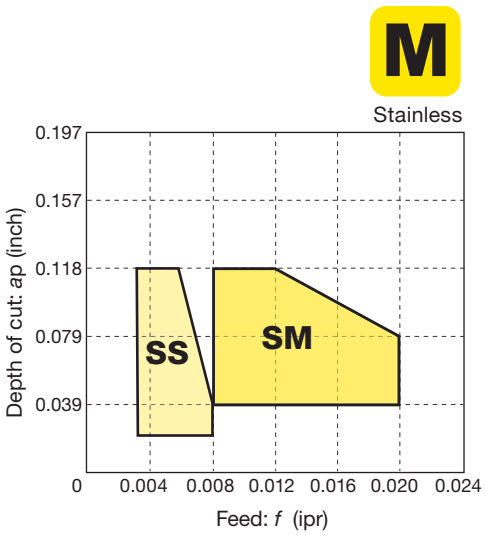
NS9530 : Suitable for finishing to medium cutting of steel
GT9530 : Ideal for finishing with high surface quality



AH600 SERIES (PVD)

PREMIUMTEC TUNGALOY

AH630 : Good resistance to wear and fracture in machining stainless steel at low to medium cutting speed
AH645 : High fracture resistance in machining stainless steel



T6100 SERIES (CVD)

PREMIUMTEC TUNGALOY

T6120 : Good wear resistance in continuous cutting at high speed
T6130 : High wear resistance in cutting at medium to high speed

GRADES & CHIPBREAKERS

T5100 SERIES (CVD)

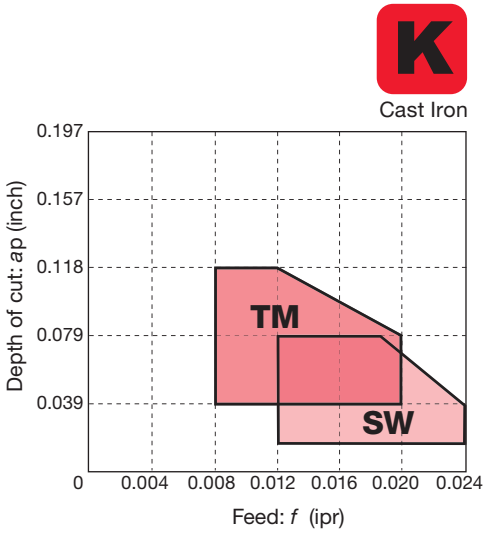
PREMIUMTEC TUNGALOY

T5115 : Stable machining in a wide range of applications from continuous to interrupted cutting

T515 (CVD)

PREMIUMTEC TUNGALOY

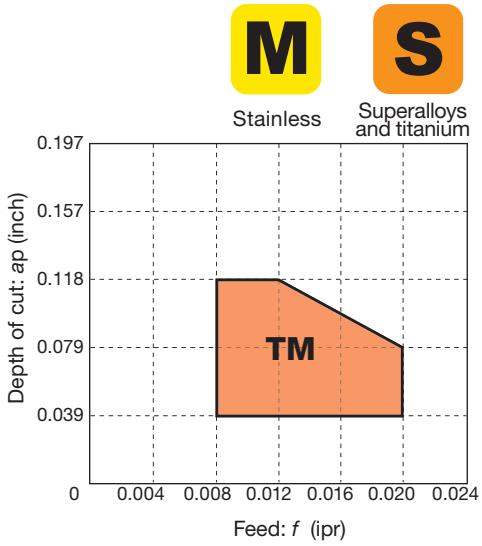
T515 : Good wear resistance even in high speed machining



AH8000 SERIES (PVD)

PREMIUMTEC TUNGALOY

AH8015 : Strong resistance to wear and built up edge



AH120 (PVD)

PREMIUMTEC TUNGALOY

AH120 : Suitable for machining steel, stainless steel, cast iron and heat resistant alloys under general cutting conditions

AD-*L-4/3-* -SET

Cartridge Set for ISO-Eco Turn insert

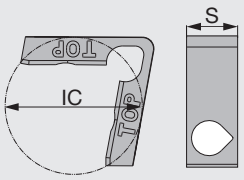


Fig.1 AD-CL-4/3-(-S) CartridgeSet

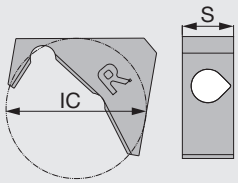


Fig.2 AD-CL-4/3-W-CartridgeSet

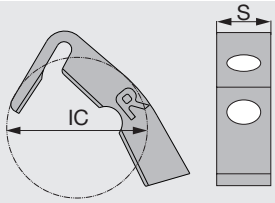


Fig.3 AD-WL-4/3-CartridgeSet

Inch	IC	S	Insert	Fig.
AD-CL-4/3-SET	0.5	0.186	CNM* 33*E...	1
AD-CL-4/3-SET-S	0.5	0.186	CNM* 33*E...	1
AD-CL-4/3-W-SET	0.5	0.197	WNM* 33*E...	2
AD-WL-4/3-SET	0.5	0.197	WNM* 33*E...	3

SPARE PARTS

Designation	Cartidge	Lever	Wrench
AD-CL-4/3-SET	AD-CL-4/3	LR4/3	HW3.0/5
AD-CL-4/3-SET-S	AD-CL-4/3	LR4/3-T	HW3.0/5
AD-WL-4/3-SET	AD-WL-4/3	LR4/3	HW3.0/5
AD-CL-4/3-W-SET	AD-CL-4/3-W	LR4/3	HW3.0/5

Shim	Spring pin
TCN423	-
TWN423	-
LSC42-ECO D30	LSP4

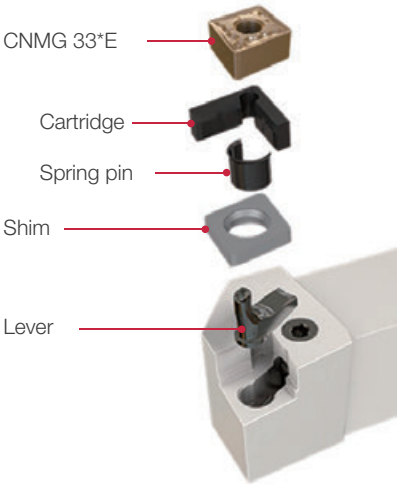
Shim and spring pin are not included

How to install the Cartridge Set

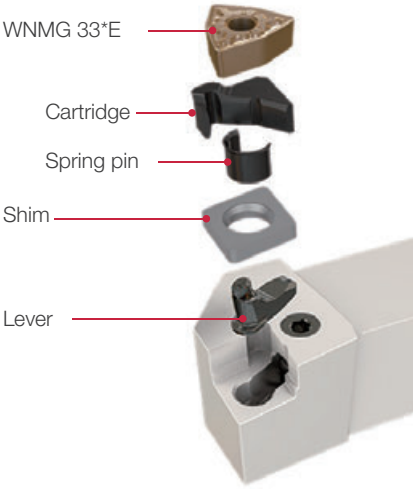
1. Remove the Shim sheet and Lever from the using toolholder (P type: Lever lock style).
2. Install the Lever → Shim sheet → Spring Pin → Catridge.

Note: Use the key for easy assembly of the spring pin.

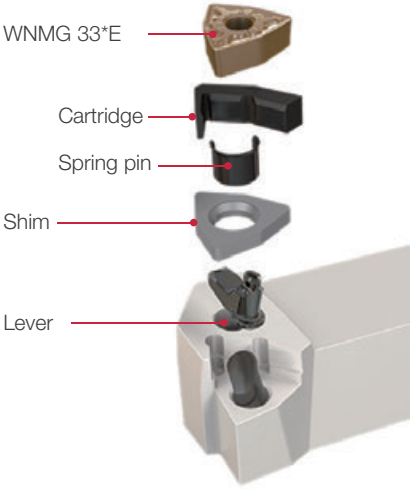
3. Offset the cutting edge position.
4. OK to machining.



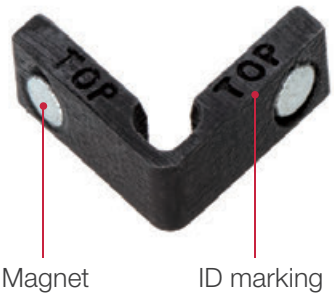
Cartridge for
CNMG 4 → Eco CNMG 3



Cartridge for
CNMG 4 → Eco WNMG 3

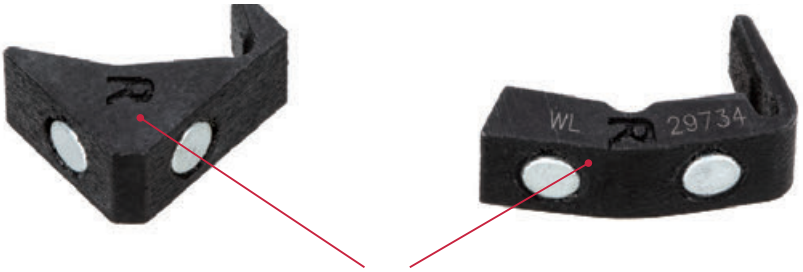


Cartridge for
WNMG 4 → Eco WNMG 3

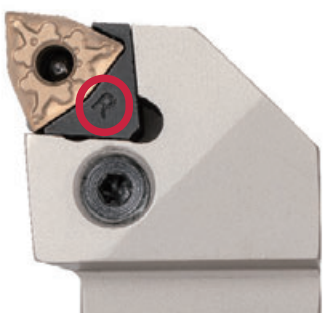


Magnet ID marking

Ensures TOP side is placed face up for both right- and left-hand inserts



Make sure to place the “R” side face up when using the right-hand insert



Note: Cartridge set cannot be assembled on Tungaloy's P-style holders.
This product might correspond to the Export Trade Control Order.
When you export this product, you might need apply for export licenses to the authorities in your country.

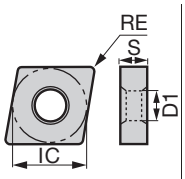
Insert NEGATIVE TYPE

● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

CN

Rhombic, 80° with hole

		T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●c	c✣	●	●c	c✣	c	✣	c✣	✣	●c				●c	●c	●c
M	Stainless		●c					●	c	c	✣	●c	c					
K	Cast iron	●c	●c		●c	●c						●c		●c	c	●c	●c	●c
N	Non-ferrous																	
S	Superalloys											●c	c					
H	Hard materials																	



Application	Chipbreaker	Designation	RE	IC	S	D1
Precision finishing	TF	CNMG 330.5E TF	0.008	0.375	0.187	0.15
		CNMG 331E TF	0.016	0.375	0.187	0.15
		CNMG 332E TF	0.032	0.375	0.187	0.15
Finishing	TSF	CNMG 330.5E TSF	0.008	0.375	0.187	0.15
		CNMG 331E TSF	0.016	0.375	0.187	0.15
		CNMG 332E TSF	0.032	0.375	0.187	0.15
Finishing (wiper)	FW	CNMG 331E FW	0.016	0.375	0.187	0.15
		CNMG 332E FW	0.031	0.375	0.187	0.15
		* Wiper				
Finishing	ZF	CNMG 331E ZF	0.016	0.375	0.187	0.15
Finishing to medium cutting (wiper)	SW	CNMG 332E SW	0.031	0.375	0.187	0.15
		CNMG 333E SW	0.047	0.375	0.187	0.15
		* Wiper				

Application	Chipbreaker	Designation	T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
Precision finishing	TF	CNMG 330.5E TF		●	●														
		CNMG 331E TF		●	●														
		CNMG 332E TF		●	●														
Finishing	TSF	CNMG 330.5E TSF		●	●														
		CNMG 331E TSF		●	●		▲	▲									●	●	●
		CNMG 332E TSF		●	●		▲	▲									●	●	●
Finishing (wiper)	FW	CNMG 331E FW	●	●	●	▲	▲	▲									●		●
		CNMG 332E FW	●	●	●	▲	▲	▲									●		●
		* Wiper																	
Finishing	ZF	CNMG 331E ZF		●	●		▲	▲											
Finishing to medium cutting (wiper)	SW	CNMG 332E SW	●	●	●	▲	▲	▲								●			
		CNMG 333E SW	●	●	●	▲	▲	▲								●			
		* Wiper																	

* Please contact our sales representative for your inquiries about the program adjustment when using SW/FW for machining of radius shape or for taper machining.

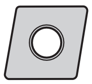
● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.21 - Internal toolholders → P.29

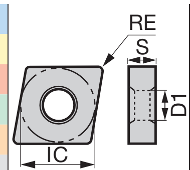
Insert NEGATIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

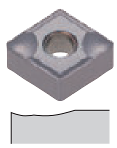
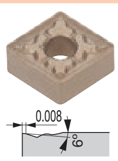
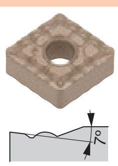
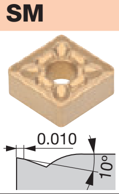
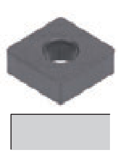
CN



Rhombic, 80° with hole



		T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●◐	◐✠	●	●◐	◐✠	◐	✠	◐✠	✠	●◐				●◐	●◐	●◐
M	Stainless		●◐					●	◐	◐	✠	●◐	◐					
K	Cast iron	●◐	●◐		●◐	●◐						●◐		●◐	◐	●◐	●◐	●◐
N	Non-ferrous																	
S	Superalloys											●◐	◐					
H	Hard materials																	

Application	Chipbreaker	Designation	Coated: T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	Coated cermet: GT9530	AT9530	Cermet: NS9530	RE	IC	S	D1
Finishing	SS 	CNMG 331E SS									●	●								0.016	0.375	0.187	0.15
		CNMG 332E SS									●	●								0.031	0.375	0.187	0.15
Medium cutting	TM  0.008 6°	CNMG 331E TM		●	●		▲	▲	●	●	●		●	●	●					0.016	0.375	0.187	0.15
		CNMG 332E TM		●	●		▲	▲	●	●	●		●	●	●					0.031	0.375	0.187	0.15
		CNMG 333E TM		●	●		▲	▲	●	●	●		●	●	●					0.047	0.375	0.187	0.15
Finishing to medium cutting	ZM  7°	CNMG 332E ZM		●	●		▲	▲												0.031	0.375	0.187	0.15
Medium cutting	SM  0.010 10°	CNMG 331E SM							●	●	●									0.016	0.375	0.187	0.15
		CNMG 332E SM							●	●	●									0.031	0.375	0.187	0.15
		CNMG 333E SM							●	●	●									0.047	0.375	0.187	0.15
Finishing to medium cutting	- 	CNMA331E													●					0.016	0.375	0.187	0.15
		CNMA332E													●					0.031	0.375	0.187	0.15
		CNMA333E													●					0.047	0.375	0.187	0.15
		CNMA334E													●					0.063	0.375	0.187	0.15

Dimension (inch)

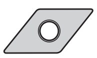
● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.21 - Internal toolholders → P.29

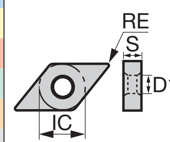
Insert NEGATIVE TYPE

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

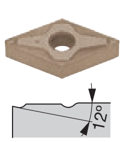
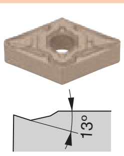
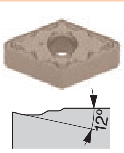
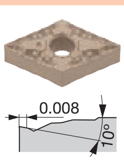
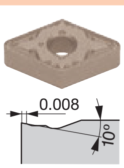
DN



Rhombic, 55° with hole



	Material	T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●◐	◐✠	●	●◐	◐✠	◐	✠	◐✠	✠	●◐				●◐	●◐	●◐
M	Stainless		●◐					●	◐	◐	✠	●◐	◐					
K	Cast iron	●◐	●◐		●◐	●◐						●◐		●◐	◐	●◐	●◐	●◐
N	Non-ferrous																	
S	Superalloys											●◐	◐					
H	Hard materials																	

Application	Chipbreaker	Designation	T9205 (Coated)	T9215 (Coated)	T9225 (Coated)	T9105 (Coated)	T9115 (Coated)	T9125 (Coated)	T6120 (Coated)	T6130 (Coated)	AH630 (Coated)	AH645 (Coated)	AH120 (Coated)	AH8015 (Coated)	T515 (Coated)	T5115 (Coated)	GT9530 (Coated cermet)	AT9530 (Coated cermet)	NS9530 (Cermet)	RE	IC	S	D1
Precision finishing	TF 	DNMG 330.5E TF		●	●															0.008	0.375	0.187	0.15
		DNMG 331E TF		●	●															0.016	0.375	0.187	0.15
		DNMG 332E TF		●	●															0.032	0.375	0.187	0.15
Finishing	TSF 	DNMG 330.5E TSF		●	●															0.008	0.375	0.187	0.15
		DNMG 331E TSF		●	●		▲	▲									●	●	●	0.016	0.375	0.187	0.15
		DNMG 332E TSF		●	●		▲	▲									●	●	●	0.032	0.375	0.187	0.15
		DNMG 333E TSF		●	●		▲	▲									●	●	●	0.047	0.375	0.187	0.15
Finishing (wiper)	FW 	DNMG 331E FW		●			▲													0.016	0.375	0.187	0.15
		DNMG 332E FW		●			▲													0.031	0.375	0.187	0.15
		* Wiper																					
Finishing	ZF 	DNMG 331E ZF		●	●		▲	▲												0.016	0.375	0.187	0.15
Finishing to medium cutting (wiper)	SW 	DNMG 332E SW		●			▲													0.031	0.375	0.187	0.15
		DNMG 333E SW		●			▲													0.047	0.375	0.187	0.15
		* Wiper																					

Dimension (inch)

* Please contact our sales representative for your inquiries about the program adjustment when using SW/FW for machining of radius shape or for taper machining.

● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.24 - Internal toolholders → P.30

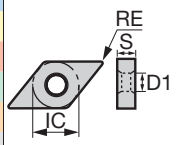
Insert NEGATIVE TYPE

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

DN

Rhombic, 55° with hole

		T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●ɔ	ɔ✣	●	●ɔ	ɔ✣	ɔ	✣	ɔ✣	✣	●ɔ				●ɔ	●ɔ	●ɔ
M	Stainless		●ɔ					●	ɔ	ɔ	✣	●ɔ	ɔ					
K	Cast iron	●ɔ	●ɔ		●ɔ	●ɔ						●ɔ		●ɔ	ɔ	●ɔ	●ɔ	●ɔ
N	Non-ferrous																	
S	Superalloys											●ɔ	ɔ					
H	Hard materials																	



Application	Chipbreaker	Designation	RE	IC	S	D1
Finishing	SS	DNMG 331E SS	0.016	0.375	0.187	0.15
		DNMG 332E SS	0.031	0.375	0.187	0.15
Medium cutting	TM	DNMG 331E TM	0.016	0.375	0.187	0.15
		DNMG 332E TM	0.031	0.375	0.187	0.15
		DNMG 333E TM	0.047	0.375	0.187	0.15
Finishing to medium cutting	ZM	DNMG 332E ZM	0.031	0.375	0.187	0.15
Medium cutting	SM	DNMG 331E SM	0.016	0.375	0.187	0.15
		DNMG 332E SM	0.031	0.375	0.187	0.15
Finishing to medium cutting	-	DNMA 331E	0.016	0.375	0.187	0.15
		DNMA 332E	0.031	0.375	0.187	0.15
		DNMA 333E	0.047	0.375	0.187	0.15

● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.24 - Internal toolholders → P.30

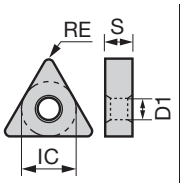
Insert NEGATIVE TYPE

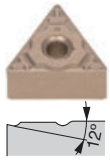
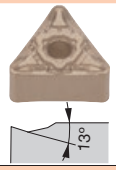
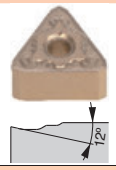
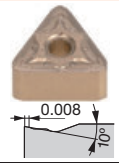
● : Continuous cutting
ɔ : Light interrupted cutting
✠ : Heavy interrupted cutting

TN

Triangular, 60° with hole

		T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●ɔ	ɔ✠	●	●ɔ	ɔ✠	ɔ	✠	ɔ✠	✠	●ɔ				●ɔ	●ɔ	●ɔ
M	Stainless		●ɔ					●	ɔ	ɔ	✠	●ɔ	ɔ					
K	Cast iron	●ɔ	●ɔ		●ɔ	●ɔ						●ɔ		●ɔ	ɔ	●ɔ	●ɔ	●ɔ
N	Non-ferrous																	
S	Superalloys											●ɔ	ɔ					
H	Hard materials																	



Application	Chipbreaker	Designation	Coated														Coated cermet		Cermet				Dimension (inch)			
			T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530				RE	IC	S	D1
Precision finishing	**TF**	**TNMG 230.5E TF**		●	●																		0.008	0.25	0.187	0.089
		**TNMG 231E TF**		●	●																		0.016	0.25	0.187	0.089
		TNMG 232E TF		●	●																		0.032	0.25	0.187	0.089
Finishing	**TSF**	**TNMG 230.5E TSF**		●	●																		0.008	0.25	0.187	0.089
		**TNMG 231E TSF**		●	●		▲	▲									●	●		●			0.016	0.25	0.187	0.089
		TNMG 232E TSF		●	●		▲	▲									●	●		●			0.032	0.25	0.187	0.089
Finishing (wiper)	**FW**	**TNMG 231E FW**		●			▲																0.016	0.25	0.187	0.089
		**TNMG 232E FW**		●			▲																0.031	0.25	0.187	0.089
		* Wiper																								
Finishing to medium cutting (wiper)	**SW**	**TNMG 232E SW**		●			▲																0.031	0.25	0.187	0.089
		**TNMG 233E SW**		●			▲																0.047	0.25	0.187	0.089
		* Wiper																								

* Please contact our sales representative for your inquiries about the program adjustment when using SW/FW for machining of radius shape or for taper machining.

● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.28

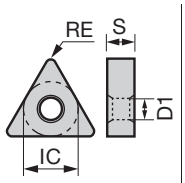
Insert NEGATIVE TYPE

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

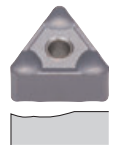
TN

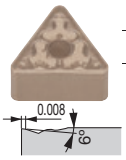
Triangular, 60° with hole

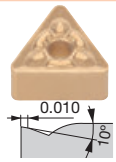
		T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●ɔ	ɔ✣	●	●ɔ	ɔ✣	ɔ	✣	ɔ✣	✣	●ɔ				●ɔ	●ɔ	●ɔ
M	Stainless		●ɔ					●	ɔ	ɔ	✣	●ɔ	ɔ					
K	Cast iron	●ɔ	●ɔ		●ɔ	●ɔ						●ɔ		●ɔ	ɔ	●ɔ	●ɔ	●ɔ
N	Non-ferrous																	
S	Superalloys											●ɔ	ɔ					
H	Hard materials																	



Application	Chipbreaker	Designation	RE	IC	S	D1
Finishing	SS	TNMG 231E SS	0.016	0.25	0.187	0.089
		TNMG 232E SS	0.031	0.25	0.187	0.089
Medium cutting	TM	TNMG 231E TM	0.016	0.25	0.187	0.089
		TNMG 232E TM	0.031	0.25	0.187	0.089
		TNMG 233E TM	0.047	0.25	0.187	0.089
	SM	TNMG 231E SM	0.016	0.25	0.187	0.089
		TNMG 232E SM	0.031	0.25	0.187	0.089
Finishing to medium cutting	-	TNMA231E	0.016	0.25	0.187	0.089
		TNMA232E	0.031	0.25	0.187	0.089
		TNMA233E	0.047	0.25	0.187	0.089







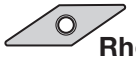
● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.28

Insert NEGATIVE TYPE

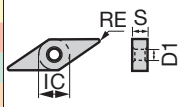
● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

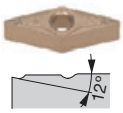
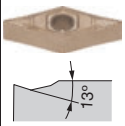
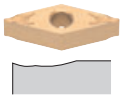
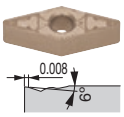
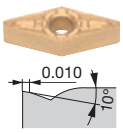
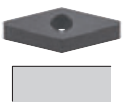
VN



Rhombic, 35° with hole

		T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●ɔ	ɔ✣	●	●ɔ	ɔ✣	ɔ	✣	ɔ✣	✣	●ɔ				●ɔ	●ɔ	●ɔ
M	Stainless		●ɔ					●	ɔ	ɔ	✣	●ɔ	ɔ					
K	Cast iron	●ɔ	●ɔ		●ɔ	●ɔ						●ɔ		●ɔ	ɔ	●ɔ	●ɔ	●ɔ
N	Non-ferrous																	
S	Superalloys											●ɔ	ɔ					
H	Hard materials																	



Application	Chipbreaker	Designation	RE	IC	S	D1
Precision finishing	TF	VNMG 2.330.5E TF	0.008	0.281	0.187	0.15
		VNMG 2.331E TF	0.016	0.281	0.187	0.15
		VNMG 2.332E TF	0.032	0.281	0.187	0.15
						
Finishing	TSF	VNMG 2.330.5E TSF	0.008	0.281	0.187	0.15
		VNMG 2.331E TSF	0.016	0.281	0.187	0.15
		VNMG 2.332E TSF	0.031	0.281	0.187	0.15
						
	SS	VNMG 2.331E SS	0.016	0.281	0.187	0.15
		VNMG 2.332E SS	0.031	0.281	0.187	0.15
						
Medium cutting	TM	VNMG 2.331E TM	0.016	0.281	0.187	0.15
		VNMG 2.332E TM	0.031	0.281	0.187	0.15
						
	SM	VNMG 2.331E SM	0.016	0.281	0.187	0.15
		VNMG 2.332E SM	0.031	0.281	0.187	0.15
						
Finishing to medium cutting	-	VNMA 2.331E	0.016	0.281	0.187	0.15
		VNMA 2.332E	0.031	0.281	0.187	0.15
						

● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.26 - Internal toolholders → P.30

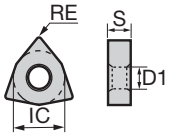
Insert NEGATIVE TYPE

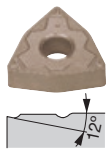
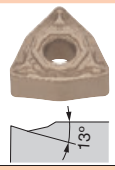
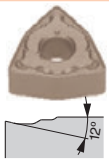
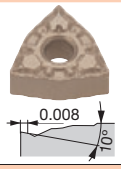
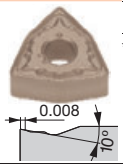
● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

WN

Trigon, 80° with hole

		T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●ɔ	ɔ✣	●	●ɔ	ɔ✣	ɔ	✣	ɔ✣	✣	●ɔ				●ɔ	●ɔ	●ɔ
M	Stainless		●ɔ					●	ɔ	ɔ	✣	●ɔ	ɔ					
K	Cast iron	●ɔ	●ɔ		●ɔ	●ɔ						●ɔ		●ɔ	ɔ	●ɔ	●ɔ	●ɔ
N	Non-ferrous																	
S	Superalloys											●ɔ	ɔ					
H	Hard materials																	



Application	Chipbreaker	Designation	T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530	RE	IC	S	D1
			Coated														Coated cermet		Cermet	Dimension (inch)			
Precision finishing	**TF**	**WNMG 330.5E TF**		●	●															0.008	0.375	0.187	0.15
		**WNMG 331E TF**		●	●															0.016	0.375	0.187	0.15
		WNMG 332E TF		●	●															0.032	0.375	0.187	0.15
Finishing	**TSF**	**WNMG 330.5E TSF**		●	●															0.008	0.375	0.187	0.15
		**WNMG 331E TSF**		●	●		▲	▲									●	●	●	0.016	0.375	0.187	0.15
		WNMG 332E TSF		●	●		▲	▲									●	●	●	0.032	0.375	0.187	0.15
		WNMG 333E TSF		●	●		▲	▲									●		●	0.047	0.375	0.187	0.15
Finishing (wiper)	**FW**	**WNMG 331E FW**	●	●	●	▲	▲	▲									●		●	0.016	0.375	0.187	0.15
		**WNMG 332E FW**	●	●	●	▲	▲	▲									●		●	0.031	0.375	0.187	0.15
		* Wiper																					
Finishing	**ZF**	**WNMG 331E ZF**		●	●		▲	▲												0.016	0.375	0.187	0.15
																							
Finishing to medium cutting (wiper)	**SW**	**WNMG 332E SW**	●	●	●	▲	▲	▲							●					0.031	0.375	0.187	0.15
		**WNMG 333E SW**	●	●	●	▲	▲	▲							●					0.047	0.375	0.187	0.15
		* Wiper																					

* Please contact our sales representative for your inquiries about the program adjustment when using SW/FW for machining of radius shape or for taper machining.

● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.22 - Internal toolholders → P.29

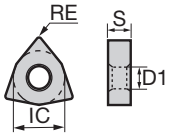
Insert NEGATIVE TYPE

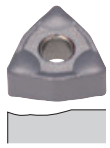
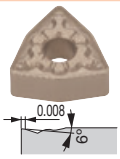
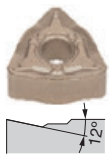
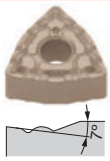
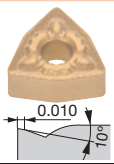
● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

WN

Trigon, 80° with hole

P	Steel	●	●c	c✣	●	●c	c✣	c	✣	c✣	✣	●c					●c	●c			●c				
M	Stainless		●c					●	c	c	✣	●c	c												
K	Cast iron	●c	●c		●c	●c						●c		●c	c		●c	●c			●c				
N	Non-ferrous																								
S	Superalloys											●c	c												
H	Hard materials																								



Application	Chipbreaker	Designation	Coated													Coated cermet		Cermet		Dimension (inch)			
			T9205	T9215	T9225	T9105	T9115	T9125	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530		RE	IC	S	D1
Finishing	SS	WNMG 331E SS									●	●									0.016	0.375	0.187	0.15
		WNMG 332E SS									●	●									0.031	0.375	0.187	0.15
		WNMG 333E SS									●	●									0.047	0.375	0.187	0.15
Medium cutting	TM	WNMG 331E TM		●	●		▲	▲													0.016	0.375	0.187	0.15
		WNMG 332E TM		●	●		▲	▲													0.031	0.375	0.187	0.15
		WNMG 333E TM		●	●		▲	▲													0.047	0.375	0.187	0.15
Finishing to medium cutting	NM	WNMG 333E NM			●			▲													0.047	0.375	0.187	0.15
																								
	ZM	WNMG 332E ZM		●	●		▲	▲													0.031	0.375	0.187	0.15
																								
Medium cutting	SM	WNMG 331E SM							●	●	●										0.016	0.375	0.187	0.15
		WNMG 332E SM							●	●	●										0.031	0.375	0.187	0.15
		WNMG 333E SM							●	●	●										0.047	0.375	0.187	0.15
Finishing to medium cutting	-	WNMA 331E													●						0.016	0.375	0.187	0.15
		WNMA 332E													●						0.031	0.375	0.187	0.15
		WNMA 333E													●						0.047	0.375	0.187	0.15
		WNMA 334E													●						0.063	0.375	0.187	0.15

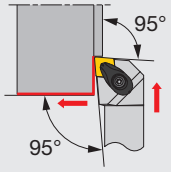
● : Line up
▲ : To be discontinued

Reference pages : External toolholders → P.22 - Internal toolholders → P.29

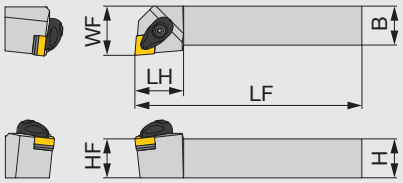
External toolholders

ACLNR/L-Eco

Double-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
ACLNR/L1233-A	0.750	0.750	4.500	0.900	0.750	1.000	0.031	CN**33...	3.0
ACLNR/L1633-A	1.000	1.000	6.000	1.000	1.000	1.250	0.031	CN**33...	3.0

*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

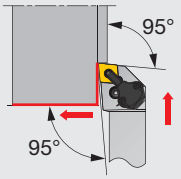
SPARE PARTS

Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
ACLNR/L**-A	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASC322	CSTB-3.5	T-15F

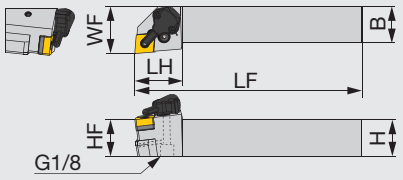
TUNGTJET URN

PCLNR/L-CHP-Eco

Lever-lock toolholder with 95° approach angle, for negative 80° rhombic inserts, with high pressure coolant capability



Cutting edge style **L**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PCLNR/L1233-CHP	0.750	0.750	4.500	1.300	0.750	1.250	0.031	CN**33...	2.0
PCLNR/L1633-CHP	1.000	1.000	6.000	1.300	1.000	1.250	0.031	CN**33....	2.0

*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

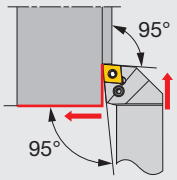
Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PCLNR/L**-CHP	LSC317	LCS3	P-2.5	LSP3	LCL33

SPARE PARTS

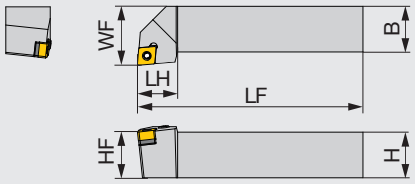
Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PCLNR/L**-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

PCLNR/L-Eco

Lever-lock toolholder with 95° approach angle, for negative 80° rhombic inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PCLNR/L1233	0.750	0.750	4.500	0.813	0.750	1.000	0.031	CN**33...	2.0
PCLNR/L1633	1.000	1.000	6.000	0.813	1.000	1.250	0.031	CN**33...	2.0

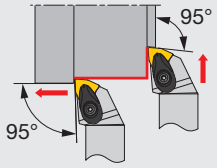
*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

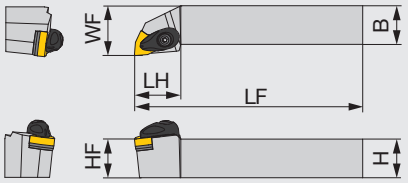
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PCLNR/L**	LSC317	LCS3	P-2.5	LSP3	LCL33

AWLNR/L-Eco

Double-clamp toolholder with 95° approach angle, for negative 80° trigon inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
AWLNR/L1233-A	0.750	0.750	4.500	1.125	0.750	1.000	0.031	WN**33...	3.0
AWLNR/L1633-A	1.000	1.000	6.000	1.125	1.000	1.250	0.031	WN**33...	3.0

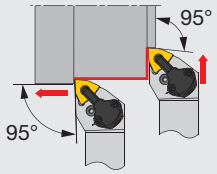
*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

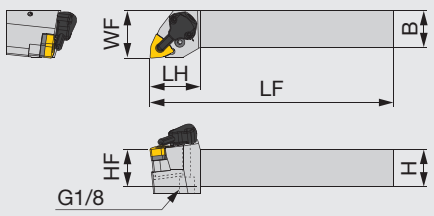
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
AWLNR/L**-A	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASW322	CSTB-3.5	T-15F

PWLNR/L-CHP

Lever-lock toolholder with 95° approach angle, for negative 80° trigon inserts, with high pressure coolant capability



Cutting edge style **L**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PWLNR/L1233-CHP	0.750	0.750	4.500	1.969	0.750	1.250	0.031	WN**33...	2.0
PWLNR/L1633-CHP	1.000	1.000	6.000	1.969	1.000	1.250	0.031	WN**33...	2.0

*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

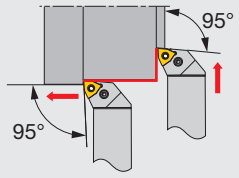
Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PWLNR/L**-CHP	LSW312	LCS3	P-2.5	LSP3	LCL3

SPARE PARTS

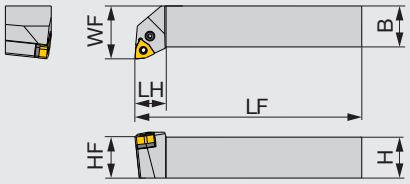
Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PWLNR/L**-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

PWLNR/L-Eco

Lever-lock toolholder with 95° approach angle, for negative 80° trigon inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PWLNR/L1233	0.750	0.750	4.500	0.625	0.750	1.000	0.031	WN**33...	2.0
PWLNR/L1633	1.000	1.000	6.000	0.719	1.000	1.250	0.031	WN**33...	2.0

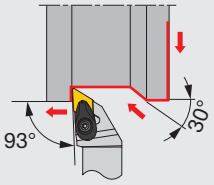
*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

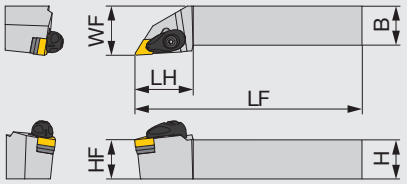
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PWLNR/L**	LSW312	LCS3	P-2.5	LSP3	LCL3

ADJNR/L-Eco

Double-clamp toolholder with 93° approach angle, for negative 55° rhombic inserts



Cutting edge style **J**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
ADJNR/L1233-A	0.750	0.750	4.500	1.250	0.750	1.000	0.031	DN**33...	3.0
ADJNR/L1633-A	1.000	1.000	6.000	1.250	1.000	1.250	0.031	DN**33...	3.0

*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS





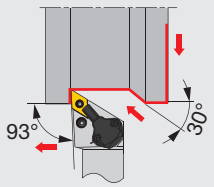


Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
ADJNR/L**-A	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASD322	CSTB-3.5	T-15F

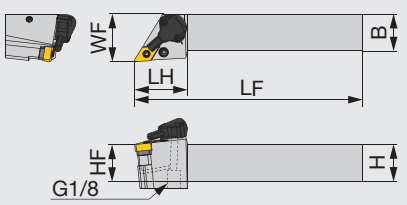
TUNGTJET ECO

PDJNR/L-CHP-Eco

Lever-lock toolholder with 93° approach angle, for negative 55° rhombic inserts, with high pressure coolant capability



Cutting edge style **J**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PDJNR/L1233-CHP	0.750	0.750	4.500	1.420	0.750	1.250	0.031	DN**33...	2.0
PDJNR/L1633-CHP	1.000	1.000	6000	1.420	1.000	1.250	0.031	DN**33...	2.0

*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS





Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PDJNR/L**-CHP	ELSD32	LCS3	P-2.5	LSP3	LCL33L

SPARE PARTS

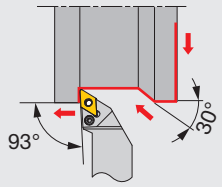




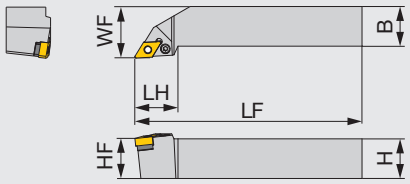

Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PDJNR/L**-CHP	CU-D-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

PDJNR/L-Eco

Lever-lock toolholder with 93° approach angle, for negative 55° rhombic inserts



Cutting edge style **J**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PDJNR/L1033	0.625	0.625	4.000	1.125	0.625	0.875	0.031	DN**33...	2.0
PDJNR/L1233	0.750	0.750	4.500	1.125	0.750	1.000	0.031	DN**33...	2.0
PDJNR/L1633	1.000	1.000	6000	1.125	1.000	1.250	0.031	DN**33...	2.0

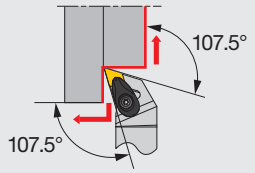
*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

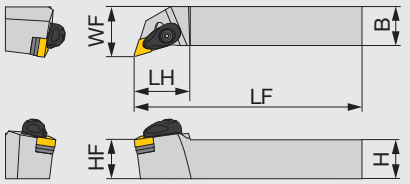
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PDJNR/L**	ELSD32	LCS3	P-2.5	LSP3	LCL33L

ADQNR/L-Eco

Double-clamp toolholder with 107.5° approach angle, for negative 55° rhombic inserts



Cutting edge style **Q**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
ADQNR/L1233-A	0.750	0.750	4.500	1.150	0.750	1.000	0.031	DN**33...	2.2
ADQNR/L1633-A	1.000	1.000	6.000	1.150	1.000	1.250	0.031	DN**33...	2.2

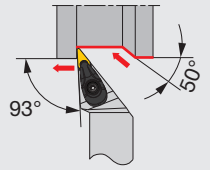
*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

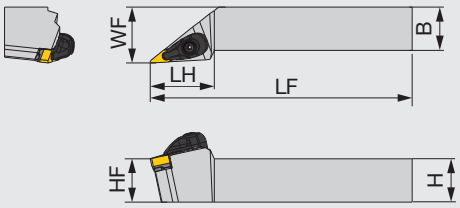
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
ADQNR/L**-A	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASD322	CSTB-3.5	T-15F

AVJNR/L-Eco

Double-clamp toolholder with 93° approach angle, for negative 35° rhombic inserts



Cutting edge style **J**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
AVJNR/L122.33-A	0.750	0.750	4.500	1.500	0.750	1.000	0.031	VN**2.33...	3.0
AVJNR/L162.33-A	1.000	1.000	6.000	1.500	1.000	1.250	0.031	VN**2.33...	3.0

*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS



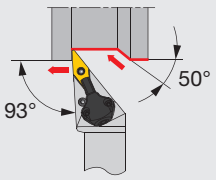




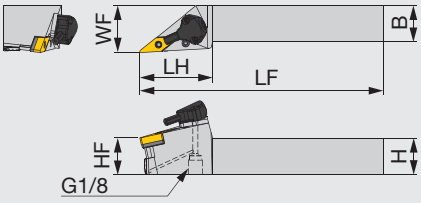
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
AVJNR/L**-A	ACP3L-E	ACS-5W	BP-7	SP-2.5	ASV222	CSTB-3.0	T-15F

TUNGTJET PVJNR/L-CHP

Lever-lock toolholder with 93° approach angle, for negative 35° rhombic inserts, with high pressure coolant capability



Cutting edge style **J**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PVJNR/L122.33-CHP	0.750	0.750	4.500	2.000	0.750	1.250	0.031	VN**2.33...	2
PVJNR/L162.33-CHP	1.000	1.000	6.000	2.000	1.000	1.250	0.031	VN**2.33...	2

*Torque: Recommended torque (lb·ft) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS





Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PVJNR/L**-CHP	LSV212	LCS3V	P-2.5	LSP3	LCL3V

SPARE PARTS

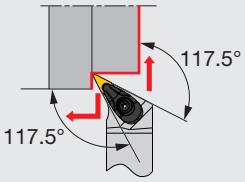




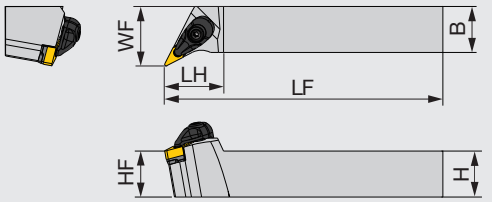

Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PVJNR/L**-CHP	CU-V-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

AVQNR/L-Eco

Double-clamp toolholder with 117.5° approach angle, for negative 35° rhombic inserts



Cutting edge style **Q**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
AVQNR/L122.33-A	0.750	0.750	4.500	1.250	0.750	1.000	0.031	VN**2.33...	3.0
AVQNR/L162.33-A	1.000	1.000	6.000	1.250	1.000	1.250	0.031	VN**2.33...	3.0

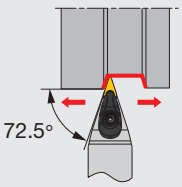
*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

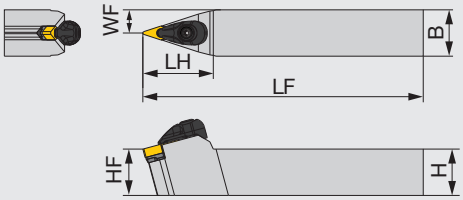
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
AVQNR/L**-A	ACP3L-E	ACS-5W	BP-7	SP-2.5	ASV222	CSTB-3.0	T-15F

AVVNN-Eco

Double-clamp toolholder with 72.5° approach angle, for negative 35° rhombic inserts



Cutting edge style **V**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
AVVNN122.33-A	0.750	0.750	4.500	1.500	0.750	0.375	0.031	VN**2.33...	3.0
AVVNN162.33-A	1.000	1.000	6.000	1.500	1.000	0.500	0.031	VN**2.33...	3.0

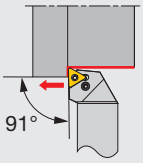
*Torque: Recommended torque (lb·f) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

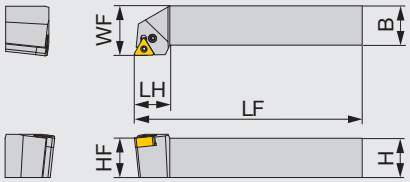
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
AVVNN**-A	ACP3L-E	ACS-5W	BP-7	SP-2.5	ASV222	CSTB-3.0	T-15F

PTGNR/L-Eco

Lever-lock toolholder with 91° approach angle, for negative triangular inserts



Cutting edge style **G**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PTGNR/L1223	0.750	0.750	4.500	0.750	1.000	1.000	0.031	TN**23...	2.0
PTGNR/L1623	1.000	1.000	6.000	0.750	1.000	1.250	0.031	TN**23...	2.0

*Torque: Recommended torque (lb·ft) for clamping
**RE: The holder measurements are true with this insert radius

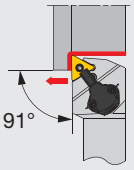
SPARE PARTS

Designation	Clamping screw	Wrench	Lever
PTGNR/L**	LCS23A	P-2.5	LCL23

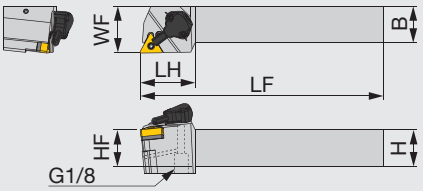
TUNGTJET

PTGNR/L-CHP

Lever-lock toolholders with 91° approach angle, for negative 60° triangular inserts, with high pressure coolant capability



Cutting edge style **G**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
PTGNR/L1223-CHP	0.750	0.750	4.500	1.500	0.750	1.250	0.031	TN**23...	2.0
PTGNR/L1623-CHP	1.000	1.000	6.000	1.500	1.000	1.250	0.031	TN**23...	2.0

*Torque: Recommended torque (lb·ft) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PTGNR/L**-CHP	-	LCS23A	P-2.5	LSP3	LCL23

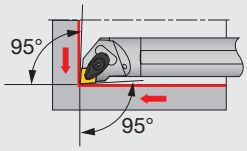
SPARE PARTS

Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PTGNR/L**-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

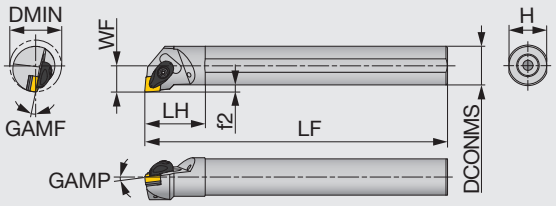
Internal toolholders

A-ACLNR/L-Eco

Double-clamp boring bar, for negative 80° rhombic inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	Material	DMIN	DCONMS	WF	LF	LH	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A16-ACLNR/L33-D20	Steel	1.250	1.000	0.672	12.000	1.750	0.906	0.172	-6	-13	0.031	CN**33...	3
A20-ACLNR/L33-D25	Steel	1.560	1.250	0.859	14.000	1.938	1.188	0.234	-6	-10	0.031	CN**33...	3

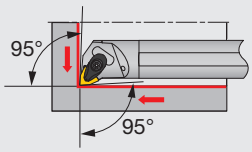
*Torque: Recommended torque (lb·ft) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

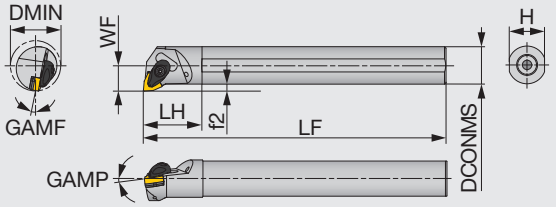
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
A**-ACLNR/L33...	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASC322	CSTB-3.5	T-15F

A-AWLNR/L-Eco

Double-clamp boring bar, for negative 80° trigon inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	Material	DMIN	DCONMS	WF	LF	LH	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A16-AWLNR/L33-D20	Steel	1.250	1.000	0.672	12.000	1.750	0.906	0.172	-6	-13	0.031	WN**33...	3
A20-AWLNR/L33-D25	Steel	1.560	1.250	0.859	14.000	1.938	1.188	0.234	-6	-10	0.031	WN**33...	3

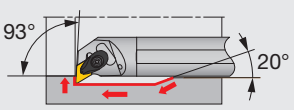
*Torque: Recommended torque (lb·ft) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

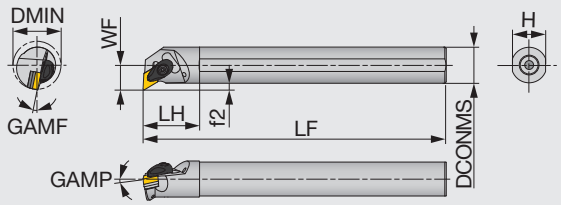
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
A**-AWLNR/L33...	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASW322	CSTB-3.5	T-15F

A-ADUNR/L-Eco

Double-clamp boring bar, for negative 55° rhombic inserts



Cutting edge style **U**



Right hand (R) shown.

Inch	Material	DMIN	DCONMS	WF	LF	LH	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A16-ADUNR/L33-D20	Steel	1.250	1.000	0.672	12.000	1.750	0.906	0.172	-6	-13	0.031	DN**33...	3
A20-ADUNR/L33-D25	Steel	1.560	1.250	0.859	14.000	1.938	1.188	0.234	-6	-11	0.031	DN**33...	3

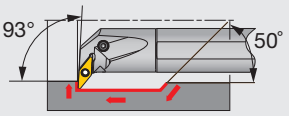
*Torque: Recommended torque (lb·ft) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

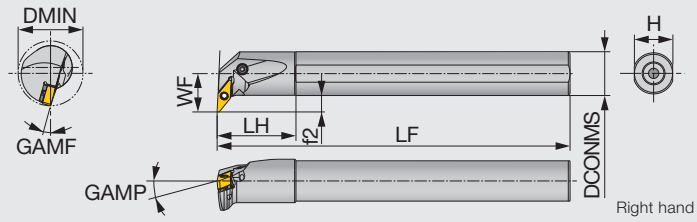
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
A**-ADUNR/L33...	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASD322	CSTB-3.5	T-15F

A-PVUNR/L-Eco

Lever-lock boring bar, for negative 35° rhombic inserts



Cutting edge style **U**



Right hand (R) shown.

Inch	Material	DMIN	DCONMS	WF	LF	LH	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A16-PVUNR/L2.33-D20	Steel	1.250	1.000	0.672	12.000	1.750	0.906	0.167	-6	-13	0.031	VN**2.33**E...	3.0
A16-PVUNR/L2.33-D24	Steel	1.500	1.000	0.859	12.000	1.750	0.906	0.354	-6	-10	0.031	VN**2.33**E...	3.0
A20-PVUNR/L2.33-D26	Steel	1.643	1.250	0.859	14.000	2.000	1.188	0.229	-6	-10	0.031	VN**2.33**E...	3.0

*Torque: Recommended torque (lb·ft) for clamping
**RE: The holder measurements are true with this insert radius

SPARE PARTS

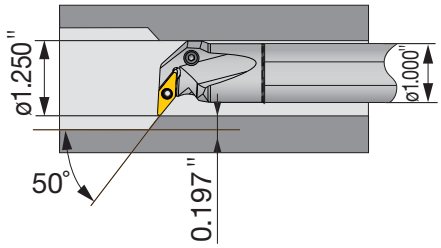
Designation	Clamping screw	Wrench	Lever	Shim	Spring pin	Oil supply attachment*	Screw for oil hole*
A16-PVUNR/L2.33-D20	LCS3V	P-2.5	LCL3V	LSV212	LSP3	EA-25	SSHM4-5
A16-PVUNR/L2.33-D24	LCS3V	P-2.5	LCL3V	LSV212	LSP3	EA-25	SSHM4-5
A20-PVUNR/L2.33-D26	LCS3V	P-2.5	LCL3V	LSV212	LSP3	EA-32	SSHM4-5

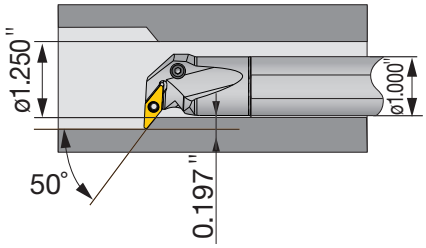
*Optional

Economical sized insert bring benefits in small diameter ID Turning

- The new VNMG233 insert combined with a P-type holder can turn and profile an inner diameter as small as ø1.250".

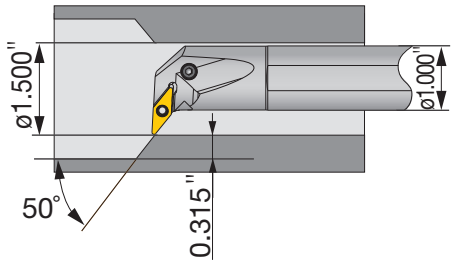
A16-PVUNR/L2.33-D20

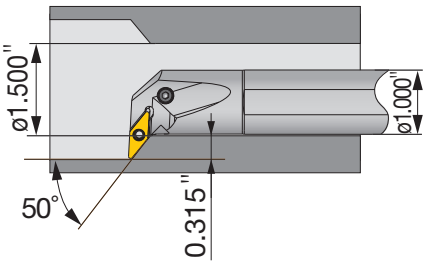




- ISO-EcoTurn also offers a holder line for a minimum working diameter of ø1.500" with VNMG2.33 insert. This holder makes an excellent alternative to a standard holder with VNMG33 insert, whose minimum working diameter is also ø1.500" .

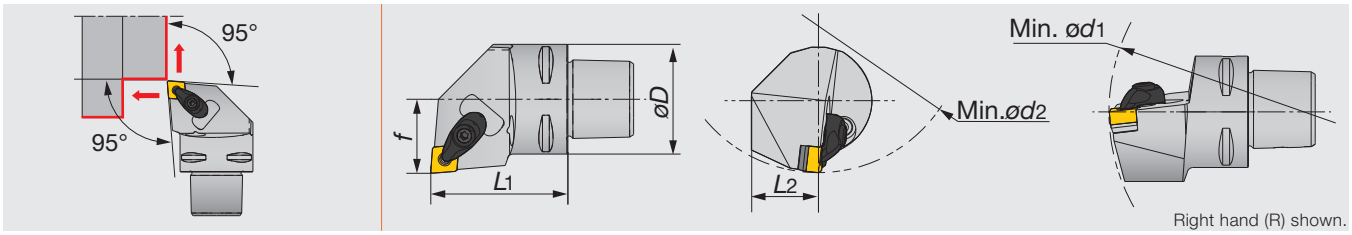
A16-PVUNR/L2.33-D24





C-ACLNR/L

TurningA double-clamp toolholder with 95° approach angle. For negative 80° rhombic insert.



Right hand (R) shown.

Metric	øD	L1	L2	f	ød1	ød2	rε**	Insert
C4ACLNR/L27050-0904N	40	50	25	27	140	110	0.8	CN**0904.../CN**33
C6ACLNR/L45065-0904N	63	65	35	45	190	110	0.8	CN**0904.../CN**33

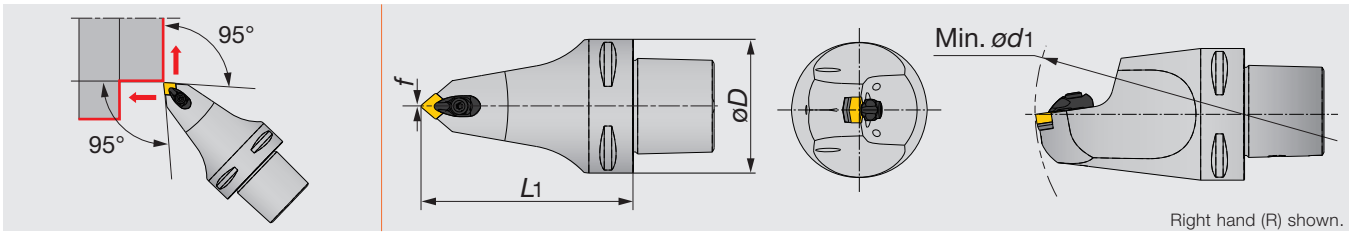
Applicable for 7 MPa pressure coolant.

SPARE PARTS

Designation	Clamp	Clamping screw	Coolant parts	Shim	Shim screw	Spring	Spring 1	Wrench	Wrench 1
C*ACLNR/L**-0904N	ACP3S-E	ACS-5W	SATZ-M10X1-M5	ASC322	CSTB-3.5	BP-7	SP-2.5	-	T-15F

C-ACMNN

TurningA double-clamp toolholder with 95° approach angle. For negative 80° rhombic insert.



Right hand (R) shown.

Metric	øD	L1	L2	f	ød1	ød2	rε**	Insert
C6ACMNN00100-0904N	63	100	-	0	110	-	0.8	CN**0904.../CN**33
C6ACMNN00140-0904N	63	140	-	0	110	-	0.8	CN**0904.../CN**33

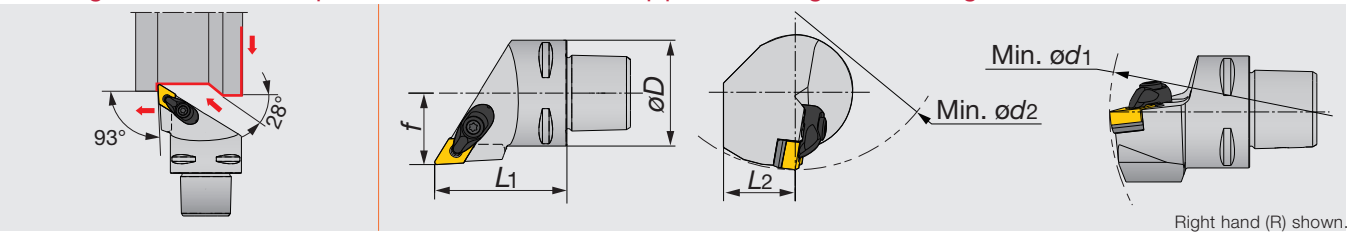
Applicable for 7 MPa pressure coolant.

SPARE PARTS

Designation	Clamp	Clamping screw	Coolant parts	Shim	Shim screw	Spring	Spring 1	Wrench	Wrench 1
C6ACMNN**-0904N	ACP3S-E	ACS-5W	-	ASC322	CSTB-3.5	BP-7	SP-2.5	-	T-15F

C-ADJNR/L

TurningA double-clamp toolholder with 93° approach angle. For negative 55° rhombic insert.



Right hand (R) shown.

Metric	øD	L1	L2	f	ød1	ød2	rε**	Insert
C4ADJNR/L27050-1104N	40	50	25	27	145	110	0.8	DN**1104.../DN**33
C6ADJNR/L45065-1104N	63	65	35	45	190	119	0.8	DN**1104.../DN**33

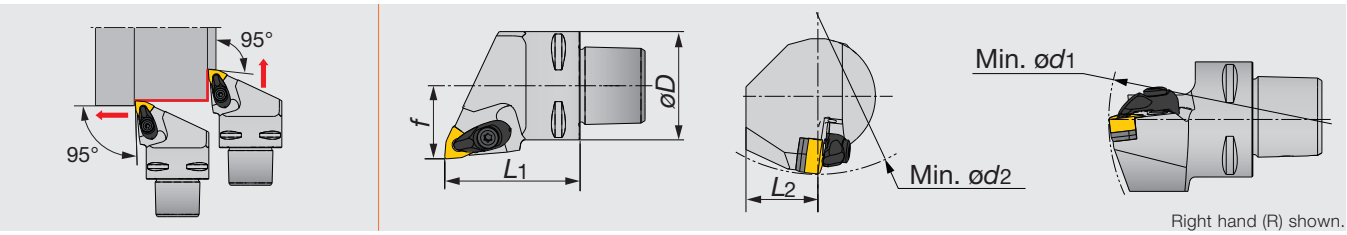
Applicable for 7 MPa pressure coolant.

SPARE PARTS

Designation	Clamp	Clamping screw	Coolant parts	Shim	Shim screw	Spring	Spring 1	Wrench	Wrench 1
C*ADJNR/L**-1104N	ACP3S-E	ACS-5W	SATZ-M10X1-M5	ASD322	CSTB-3.5	BP-7	SP-2.5	-	T-15F

C-AWLNR/L

TurningA double-clamp toolholder with 95° approach angle. For negative 80° trigon inserts.



Right hand (R) shown.

Metric	øD	L1	L2	f	ød1	ød2	rε**	Insert
C4AWLNR/L27050-0604N	40	50	25	27	140	110	0.8	WN**0604.../CN**33

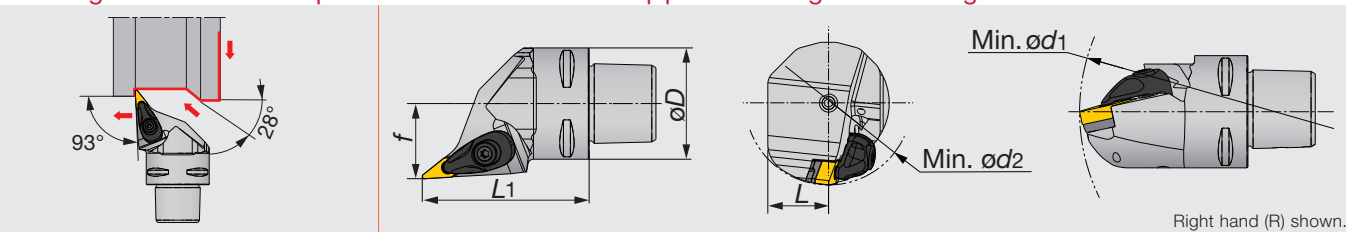
Applicable for 7 MPa pressure coolant.

SPARE PARTS

Designation	Clamp	Clamping screw	Coolant parts	Shim	Shim screw	Spring	Spring 1	Wrench	Wrench 1
C4AWLNR/L27050-0604N	ACP3S-E	ACS-5W	-	ASW322	CSTB-3.5	BP-7	SP-2.5	-	T-15F

C-AVJNR/L

TurningA double-clamp toolholder with 93° approach angle. For negative 35° rhombic insert.



Right hand (R) shown.

Metric	øD	L1	L2	f	ød1	ød2	rε**	Insert
C4AVJNR/L27060-1204N	40	60	20	27	140	55	0.8	VN**1204.../VN**2.33
C6AVJNR/L45065-1204N	63	65	31.5	45	190	81	0.8	VN**1204.../VN**2.33

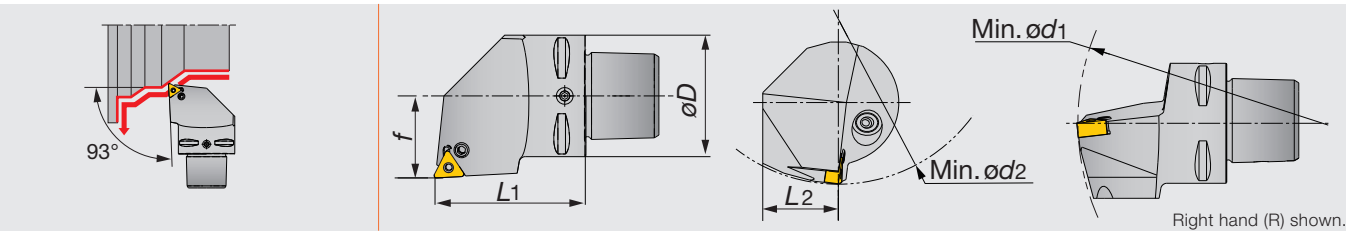
Applicable for 7 MPa pressure coolant.

SPARE PARTS

Designation	Clamp	Clamping screw	Coolant parts	Shim	Shim screw	Spring	Spring 1	Wrench	Wrench 1
C4AVJNR/L27060-1204N	ACP3L-E	ACS-5W	-	ASV222	CSTB-3	BP-7	SP-2.5	T-9F	T-15F
C6AVJNR/L45065-1204N	ACP3L-E	ACS-5W	SATZ-M10X1-M5	ASV222	CSTB-3	BP-7	SP-2.5	T-9F	T-15F

C-PTJNR/L

Lever lock type toolholder with 93° approach angle. For negative 60° triangular insert.



Right hand (R) shown.

Metric	øD	L1	L2	f	ød1	ød2	rε**	Insert
C4PTJNR/L27050-1104N	40	50	25	27	140	110	0.8	TN**1104.../TN**23

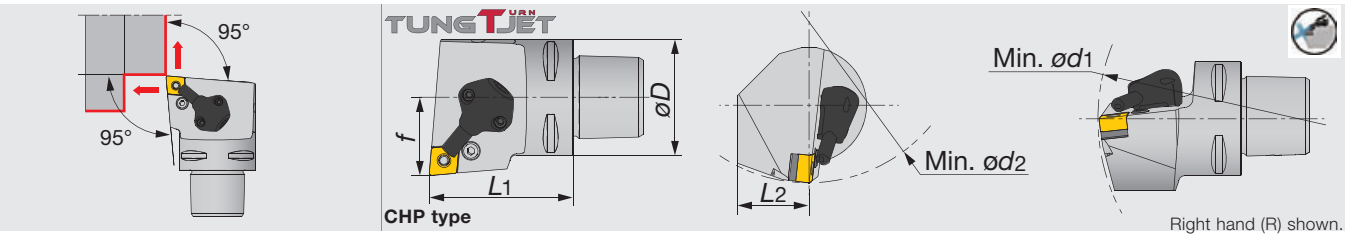
Applicable for 7 MPa pressure coolant.

SPARE PARTS

Designation	Clamping screw	Lever	Wrench 1
C4PTJNR/L27050-1104N	LCS23A	LCL23	P-2.5

C-PCLNR/L-CHP

Lever lock type toolholder with 95° approach angle. For negative 80° rhombic insert.



Metric	øD	L1	L2	f	ød1	ød2	rε**	Insert
C4PCLNR/L27050-0904-CHP	40	50	25	27	140	110	0.8	CN**0904.../CN**33
C6PCLNR/L45065-0904-CHP	63	65	35	45	190	110	0.8	CN**0904.../CN**33

Applicable for 14 MPa pressure coolant

SPARE PARTS

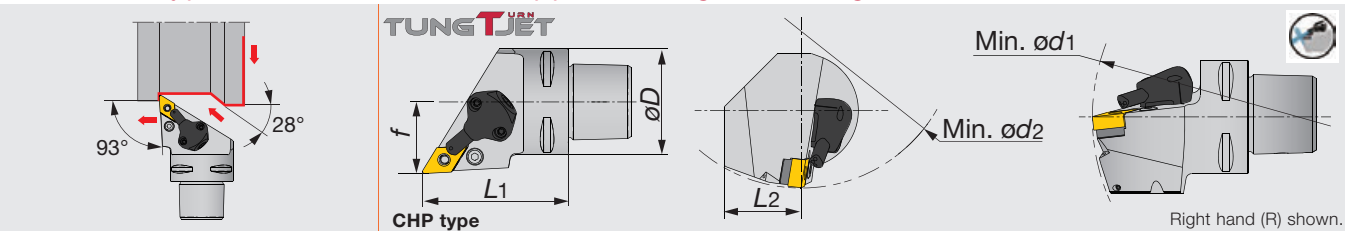
Designation	Shim	Clamping screw	Spring pin	Lever	Wrench 1
C*PCLNR/L**-0904-CHP	LSC317	LCS3	LSP3	LCL33	P-2.5

SPARE PARTS

Designation	Coolant unit	Mounting screw	Wrench 2	O-ring
C*PCLNR/L**-0904-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N

C-PDJNR/L-CHP

Lever lock type toolholder with 93° approach angle. For negative 55° rhombic insert.



Metric	øD	L1	L2	f	ød1	ød2	rε**	Insert
C4PDJNR/L27055-1104-CHP	40	55	27	27	145	110	0.8	DN**1104.../DN**33
C6PDJNR/L45065-1104-CHP	63	65	35	45	195	95	0.8	DN**1104.../DN**33

Applicable for 14 MPa pressure coolant

SPARE PARTS

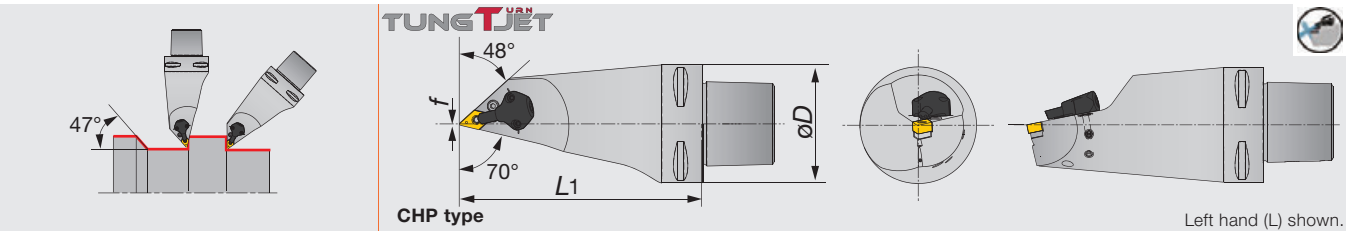
Designation	Shim	Clamping screw	Spring pin	Lever	Wrench 1
C*PDJNR/L**-1104-CHP	ELSD32	LCS3	LSP3	LCL33	P-2.5

SPARE PARTS

Designation	Coolant unit	Mounting screw	Wrench 2	O-ring
C*PDJNR/L**-1104-CHP	CU-D-CHP	SRM3	T-8F	OR6.4X0.9N

C-PDMNL-CHP

Lever lock type toolholder with 93° approach angle. For negative 55° rhombic insert.



Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	rε**	Insert
C6PDMNL00130-1104-CHP	63	130	-	0	-	-	0.8	DN**1104.../DN**33

Applicable for 14 MPa pressure coolant.

SPARE PARTS

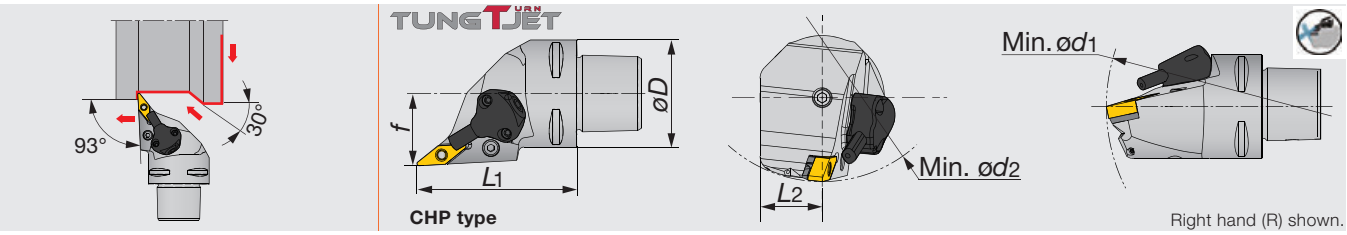
Designation	Shim	Clamping screw	Spring pin	Lever	Wrench 1
C6PDMNL00130-1104-CHP	ELSD32	LCS3	LSP3	LCL33L	P-2.5

SPARE PARTS

Designation	Coolant unit	Mounting screw	Wrench 2	O-ring
C6PDMNL00130-1104-CHP	CU-D-CHP	SRM3	T-8F	OR6.4X0.9N

C-PVJNR/L-CHP

Lever lock type toolholder with 93° approach angle. For negative 35° rhombic inserts.



Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	rε**	Insert
C4PVJNR/L27060-1204-CHP	40	60	20	27	140	90	0.8	VN**1204.../VN**2.33
C6PVJNR/L45065-1204-CHP	63	65	31.5	45	190	81	0.8	VN**1204.../VN**2.33

Applicable for 14 MPa pressure coolant.

SPARE PARTS

Designation	Shim	Clamping screw	Spring pin	Lever		Wrench 2
C*PVJNR/L**-1204-CHP	LSV212	LCS3V	LSP3	LCL3V	P-2.5	P-3

SPARE PARTS

Designation	Coolant unit	Mounting screw	Wrench 2	O-ring
C*PVJNR/L**-1204-CHP	CU-V-CHP	SRM3	T-8F	OR6.4X0.9N

STANDARD CUTTING CONDITIONS

P Steel

Application	Chipbreaker	Grades	Cutting speed *Vc* (sfm)			Depth of cut *ap* (inch)	Feed *f* (ipr)
			Low carbon steels Alloy steels	Medium carbon steels Alloy steels	High carbon steels Alloy steels		
Precision finishing	TF	T9215	492 - 1312	492 - 1312	394 - 984	0.004 - 0.02	0.001 - 0.006
		T9225	394 - 984	394 - 984	328 - 820		
Finishing	TSF	NS9530	492 - 820	262 - 722	262 - 591	0.008 - 0.059	0.003 - 0.016
		GT9530	492 - 984	262 - 820	262 - 656		
		AT9530	492 - 984	262 - 820	262 - 656		
		T9215	492 - 1312	492 - 1312	394 - 984		
		T9225	394 - 984	394 - 984	328 - 820		
	ZF	T9215	492 - 1312	492 - 1312	394 - 984	0.008 - 0.059	0.003 - 0.008
		T9225	394 - 984	394 - 984	328 - 820		
Finishing (Wiper)	FW	T9205	591 - 1312	591 - 1312	492 - 1148	0.008 - 0.059	0.003 - 0.016
		T9215	492 - 1312	492 - 1312	394 - 984		
		T9225	394 - 984	394 - 984	328 - 820		
		NS9530	492 - 820	262 - 722	262 - 591	0.02 - 0.059	0.008 - 0.016
		GT9530	492 - 984	262 - 820	262 - 656		
Finishing to medium cutting	ZM	T9215	492 - 1312	492 - 1312	394 - 984	0.028 - 0.079	0.006 - 0.016
		T9225	394 - 984	394 - 984	328 - 820		
Finishing to medium cutting (Wiper)	SW	T9205	591 - 1312	591 - 1312	492 - 1148	0.02 - 0.079	0.012 - 0.024
		T9215	492 - 1312	492 - 1312	394 - 984		
		T9225	394 - 984	394 - 984	328 - 820		
Finishing to medium cutting	NM	T9225	394 - 984	394 - 984	328 - 820	0.02 - 0.079	0.006 - 0.016
Medium cutting	TM	T9215	492 - 1312	492 - 1312	394 - 984	0.039 - 0.118	0.008 - 0.02
		T9225	394 - 984	394 - 984	328 - 820		

M Stainless

Application	Chipbreaker	Grades	Cutting speed *Vc* (sfm)			Depth of cut *ap* (inch)	Feed *f* (ipr)
			Austenitic	Ferritic / Martensitic	Precipitation hardened		
Finishing	SS	AH630	295 - 623	361 - 689	197 - 295	0.02 - 0.118	0.003 - 0.008
		AH645	230 - 492	295 - 558	-		
Medium cutting	SM	T6120	459 - 787	525 - 919	262 - 492	0.039 - 0.118	0.008 - 0.02
		T6130	328 - 656	394 - 787	230 - 361		
		AH630	295 - 623	361 - 689	197 - 295		

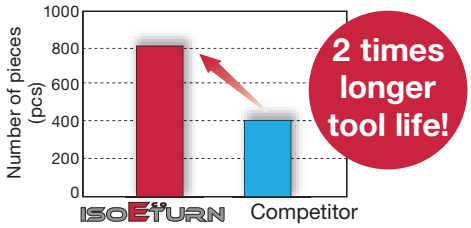
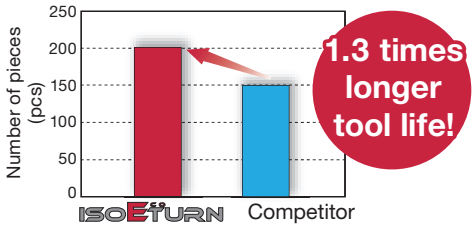
K Cast Iron

Application	Chipbreaker	Grades	Cutting speed *Vc* (sfm)		Depth of cut *ap* (inch)	Feed *f* (ipr)
			Grey cast irons	Ductile cast irons		
Finishing to medium cutting (Wiper)	SW	T5115	459 - 1312	459 - 1214	0.02 - 0.079	0.012 - 0.024
Medium cutting	TM	T515	492 - 2297	459 - 1214	0.039 - 0.118	0.008 - 0.02

S Superalloys and titanium

Application	Chipbreaker	Grades	Cutting speed *Vc* (sfm)		Depth of cut *ap* (inch)	Feed *f* (ipr)
			Titanium alloys	Ni-base alloys		
Medium cutting	TM	AH8015	66 - 492	66 - 328	0.039 - 0.118	0.008 - 0.02

PRACTICAL EXAMPLES

Workpiece type		**Machine part**	**Shaft**
Toolholder		AWLNR1633-A	ADJNR1633-A
Insert		WNMG 332E TM	DNMG 332E TSF
Grade		T9215	T9215
Workpiece material		low alloy steel	1045
			
Cutting conditions	**Cutting speed: *Vc* (sfm)**	787	853
	Feed : *f* (ipr)	0.004 - 0.01	0.008
	Depth of cut : *ap* (inch)	0.039	0.039
	Machining	External face turning	External turning
	Coolant	Wet	Wet
Results			
		ISO-EcoTurn insert has demonstrated excellent chip control at 1 mm depth of cut. With T9215 grade, tool life has been doubled over the competitor's regular sized CNMG 43 insert.	ISO-EcoTurn insert in T9215 grade has increased tool life by 1.3 times over the competitor's regular sized DNMG 43 insert with added machining stability.

MEMO

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Apr. 2021 (TJ)

TurnLine

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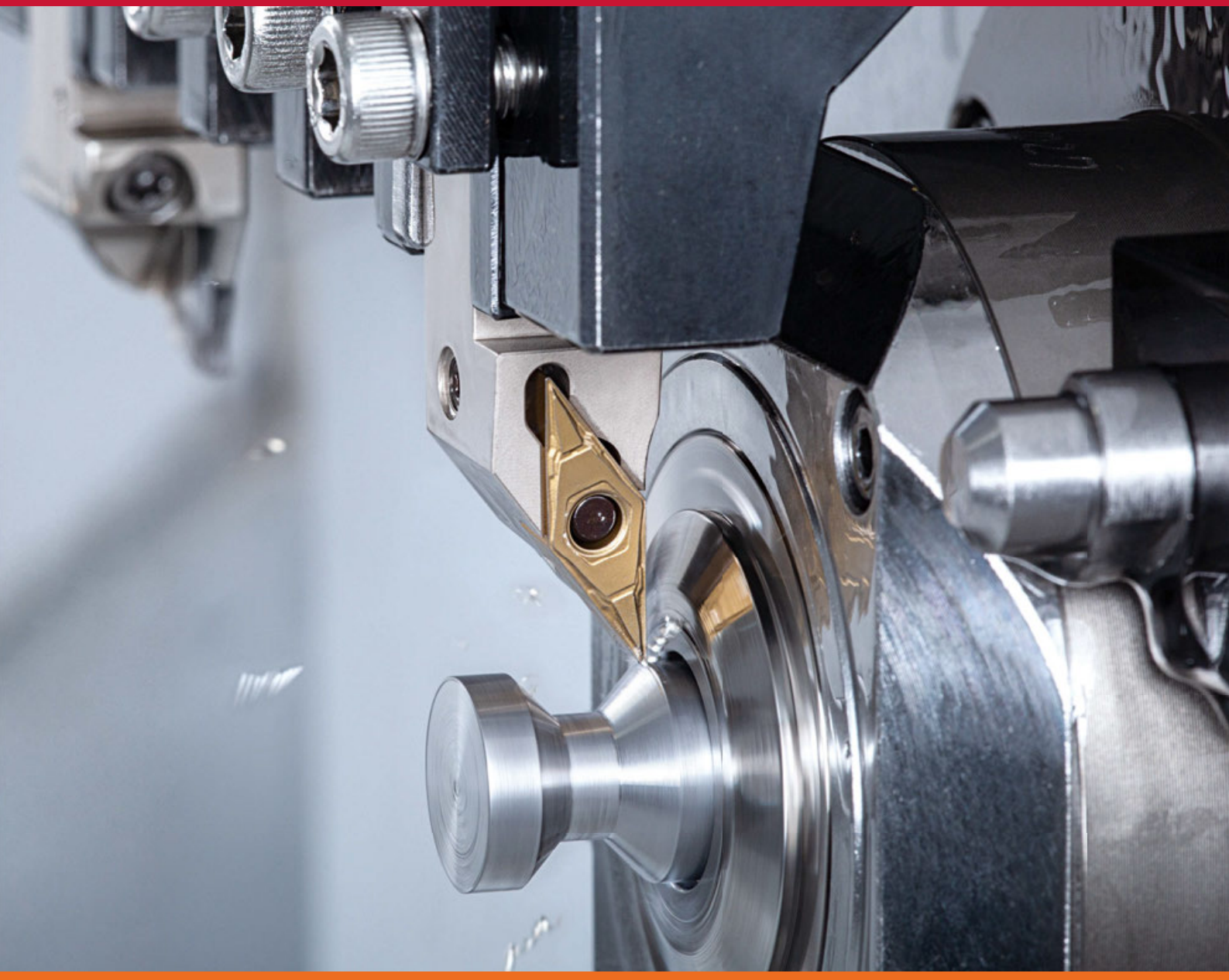
www.tungaloy.com/us

Tungaloy Report No. 426S1-US

Newest turning toolholders with easy insert clamping system



INDUSTRY 4.0

FEED the SPEED!

ISO ECO TURN
TUNGALOY

For more information

Enables easy and quick insert exchange

New tool holders for VNMG2.33**E (VNMG1204**E) insert

New

Machine type
For Swiss machines

Features
- Lever lock clamping
  (to be clamped from the back)
- Without offset
- Square shanks in sizes:
  0.500" X 0.500" (12X12) and
  0.625" X 0.625" (16X16)
- Insert: VNMG2.33**E
  (VNMG1204**E)

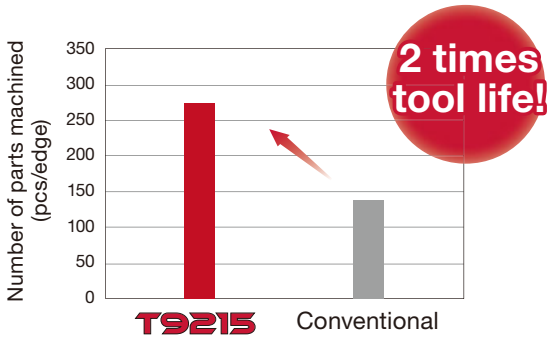
Machine type
For general CNC lathes

Features
- Standard lever lock clamping
- With offset
- Square shanks in sizes:
  New 0.625" X 0.625" (16X16),
  0.750" X 0.750" (20X20), and
  1.000" X 1.000" (25X25)
- Insert: VNMG2.33**E
  (VNMG1204**E)

Latest grades offer excellent cutting performance in a wide variety of applications

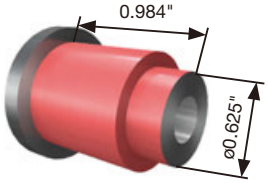
VNMG2.33**E (VNMG1204**E) line up			
Material	Grade		Chipbreaker
P K	T9215	CVD coating	TF / TSF / TM
P	T9225	CVD coating	TF / TSF
P	AT9530 / GT9530 / NS9530	Coated and uncoated cermets	TSF
M	AH630 / AH645	PVD coating	SS / SM
M	T6120 / T6130	CVD coating	SS / SM

Cutting performance



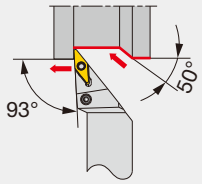
P

Insert : VNMG 2.331E TSF T9215
Workpiece material : 1045
Cutting speed : *Vc* = 492 sfm
Feed : *f* = 0.004 ipr
Depth of cut : *ap* = 0.020"
Coolant : Wet

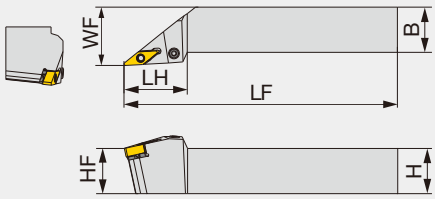


PVJNR/L-Eco

Lever-lock toolholder with 93° approach angle, for negative 35° rhombic inserts



Cutting edge style **J**



Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque
New PVJNR/L102.33	0.625	0.625	4.000	1.380	0.625	0.875	0.031	VNMG2.33...	1.48

Metric	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
New PVJNR/L1616H1204	16	16	100	35	16	20	0.8	VN**1204...	2
PVJNR/L2020K1204	20	20	125	35	20	25	0.8	VN**1204...	2
PVJNR/L2525M1204	25	25	150	35	25	32	0.8	VN**1204...	2

Torque: Recommended clamping torque: lbs·ft (*N·m)
**RE: The holder measurements are true with this insert radius

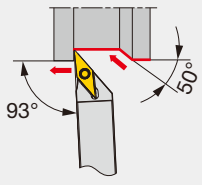
SPARE PARTS

Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PVJNR/L102.33 PVJNR/L**1204	LSV212	LCS3V	P-2.5	LSP3	LCL3V

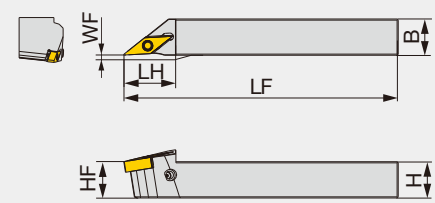
New

JPVJ2NR/L-Eco

Back-clamp toolholder with 93° approach angle, for negative 35° rhombic inserts



Cutting edge style **J**



Without offset

Right hand (R) shown.

Inch	H	B	LF	LH	HF	WF	RE**	Insert	Torque
JPVJ2NR082.33	0.500	0.500	4.75	0.900	0.500	0	0.0078	VNMG2.33...	0.66
JPVJ2NR102.33	0.625	0.625	4.75	0.900	0.625	0	0.0078	VNMG2.33...	0.66

Metric	H	B	LF	LH	HF	WF	RE**	Insert	Torque*
JPVJ2NR/L1212X1204	12	12	120	23	12	0	0.2	VN**1204...	0.9
JPVJ2NR/L1616X1204	16	16	120	23	16	0	0.2	VN**1204...	0.9

Torque: Recommended clamping torque: lbs·ft (*N·m)
**RE: The holder measurements are true with this insert radius

SPARE PARTS

Designation	Lever	Pin	Clamping screw	Wrench
JPVJ2NR/L***.33 JPVJ2NR/L**1204	SLLV-4	SL-PI-2	SR10400611	HW2.0/5RED

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Mar. 2021 (TJ)

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INDUSTRY 4.0

TurnLine
Expansion 2

ISOTURN

Tungaloy Report No. 426S2-US

New grades and chipbreakers for this economical insert series

TUNGALOY ADDFORCE
ACCELERATED LINES

ISOEcoTurn

For more information

Latest grades and chipbreakers for improved performance in all ISO applications

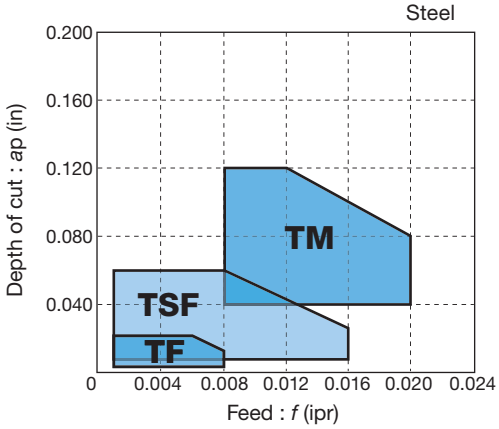
GRADES & CHIPBREAKERS

T9200 SERIES (CVD)

PREMIUMTEC TUNGALOY

T9205 : Good wear resistance
T9215 : First choice for machining steel
T9225 : Grade with a good balance of wear resistance and fracture toughness

P
Steel

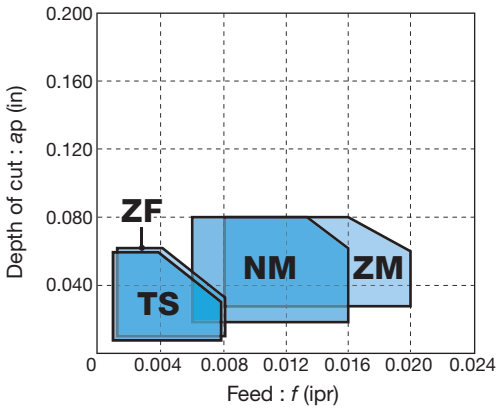


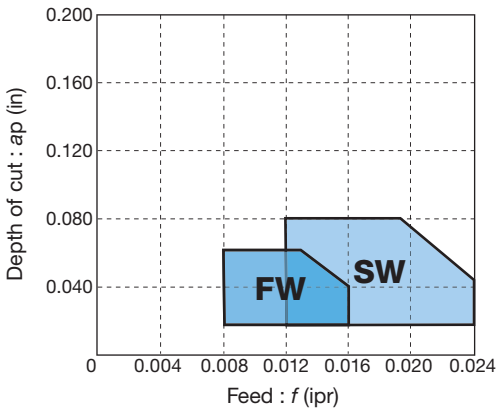
NS9530
(Cermet)

GT9530/AT9530
(Coated cermet)

PREMIUMTEC TUNGALOY

NS9530 : Suitable for finishing to medium cutting of steel
GT9530 : Provides stable tool life and excellent surface finish for finish machining of steel at high cutting speeds
AT9530 : Outstanding wear resistance. First choice for machining alloy steel

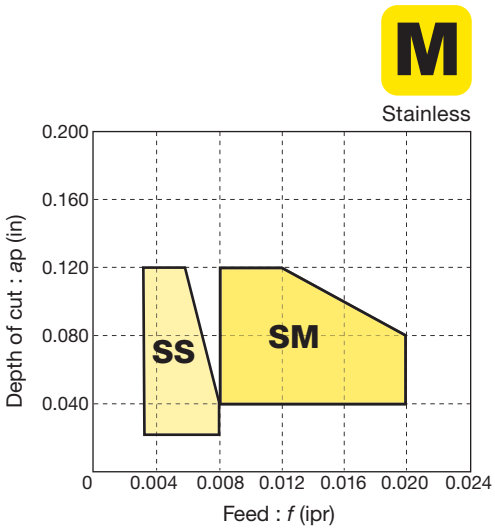




AH600 SERIES (PVD)

PREMIUMTEC TUNGALOY

AH630 : Good resistance to wear and fracture in machining stainless steel at low to medium cutting speed
AH645 : High fracture resistance in machining stainless steel



T6100 SERIES (CVD)

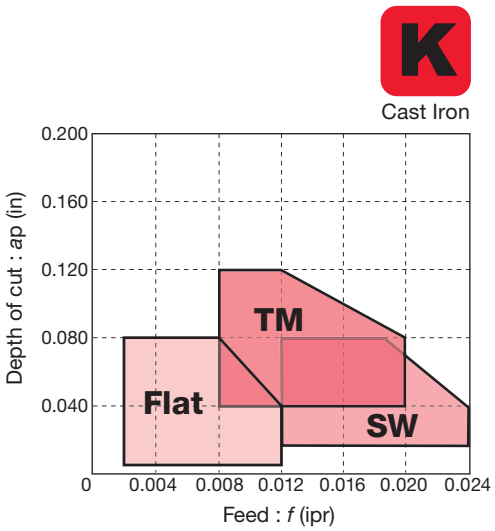
PREMIUMTEC TUNGALOY

T6120 : Good wear resistance in continuous cutting at high speed
T6130 : High wear resistance in cutting at medium to high speed

T515 (CVD)

PREMIUMTEC TUNGALOY

T515 : Good wear resistance even in high speed machining



T5100 SERIES (CVD)

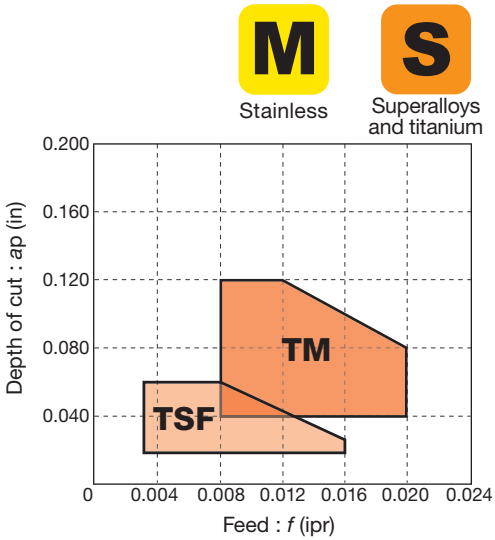
PREMIUMTEC TUNGALOY

T5115 : Stable machining in a wide range of applications from continuous to interrupted cutting

AH8000 SERIES (PVD)

PREMIUMTEC TUNGALOY

AH8015 : Strong resistance to wear and built up edge



AH120 (PVD)

PREMIUMTEC TUNGALOY

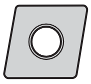
AH120 : Suitable for machining steel, stainless steel, cast iron and heat resistant alloys under general cutting conditions

ISO EcoTURN

Insert NEGATIVE TYPE

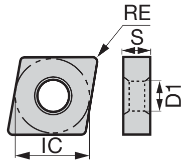
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

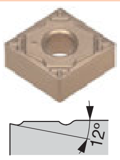
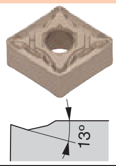
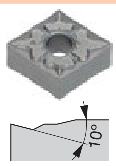
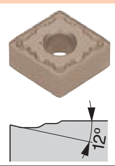
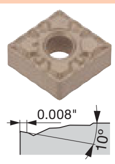
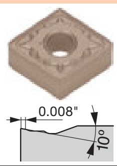
CN



Rhombic, 80° with hole

	Material	T9205	T9215	T9225	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●◐	◐✠	◐	✠	◐✠	✠	●◐				●◐	●◐	●◐
M	Stainless		●◐		●	◐	◐	✠	●◐	◐					
K	Cast iron	●◐	●◐						●◐		●◐	◐	●◐	●◐	●◐
N	Non-ferrous														
S	Superalloys								●◐	◐					
H	Hard materials														



Application	Chipbreaker	Designation: Inch	Designation: Metric	T9205 (Coated)	T9215 (Coated)	T9225 (Coated)	T6120 (Coated)	T6130 (Coated)	AH630 (Coated)	AH645 (Coated)	AH120 (Coated)	AH8015 (Coated)	T515 (Coated)	T5115 (Coated)	GT9530 (Coated cermet)	AT9530 (Coated cermet)	NS9530 (Cermet)	RE	IC	S	D1
Precision finishing	TF 	CNMG 330.5E TF	CNMG090402E-TF		●	●											🔴	0.008	0.375	0.187	0.150
		CNMG 331E TF	CNMG090404E-TF		●	●											🔴	0.016	0.375	0.187	0.150
		CNMG 332E TF	CNMG090408E-TF		●	●											🔴	0.031	0.375	0.187	0.150
Finishing	TSF 	CNMG 330.5E TSF	CNMG090402E-TSF		●	●					●	●			🔴		🔴	0.008	0.375	0.187	0.150
		CNMG 331E TSF	CNMG090404E-TSF		●	●					●	●			●	●	●	0.016	0.375	0.187	0.150
		CNMG 332E TSF	CNMG090408E-TSF		●	●					●	●			●	●	●	0.031	0.375	0.187	0.150
Finishing	TS 	CNMG 330.5E TS	CNMG090402E-TS												🔴		🔴	0.008	0.375	0.187	0.150
		CNMG 331E TS	CNMG090404E-TS												🔴		🔴	0.016	0.375	0.187	0.150
		CNMG 332E TS	CNMG090408E-TS												🔴		🔴	0.031	0.375	0.187	0.150
Finishing (wiper)	FW 	CNMG 331E FW	CNMG090404E-FW	●	●	●									●		●	0.016	0.375	0.187	0.150
		CNMG 332E FW	CNMG090408E-FW	●	●	●									●		●	0.031	0.375	0.187	0.150
			* Wiper																		
Finishing	ZF 	CNMG 331E ZF	CNMG090404E-ZF		●	●												0.016	0.375	0.187	0.150
		CNMG 332E ZF	CNMG090408E-ZF		🔴	🔴												0.031	0.375	0.187	0.150
Finishing to medium cutting (wiper)	SW 	CNMG 332E SW	CNMG090408E-SW	●	●	●								●				0.031	0.375	0.187	0.150
		CNMG 333E SW	CNMG090412E-SW	●	●	●								●				0.047	0.375	0.187	0.150
			* Wiper																		

Dimension (in)

* Please contact our sales representative for your inquiries about the program adjustment when using SW/FW for machining of radius shape or taper machining.

🔴 : New product
● : Line up

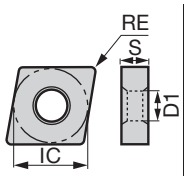
Insert NEGATIVE TYPE

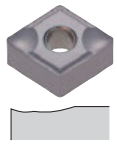
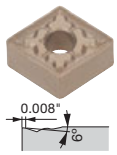
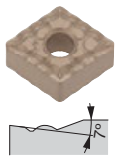
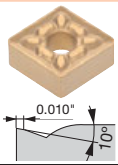
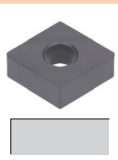
● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

CN

Rhombic, 80° with hole

P	Steel	●	●◐	◐✣	◐	✣	◐✣	✣	●◐				●◐	●◐			●◐				
M	Stainless		●◐		●	◐	◐	✣	●◐	◐											
K	Cast iron	●◐	●◐						●◐		●◐	◐	●◐	●◐			●◐				
N	Non-ferrous																				
S	Superalloys								●◐	◐											
H	Hard materials																				



Application	Chipbreaker	Designation Inch	Designation Metric	Coated T9205	T9215	T9225	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	Coated cermet GT9530	AT9530	Cermet NS9530	Dimension (in) RE	IC	S	D1
Finishing	SS	CNMG 331E SS	CNMG090404E-SS						●	●								0.016	0.375	0.187	0.150
		CNMG 332E SS	CNMG090408E-SS						●	●								0.031	0.375	0.187	0.150
Medium cutting	TM	CNMG 331E TM	CNMG090404E-TM		●	●	●	●	●		●	●	●					0.016	0.375	0.187	0.150
		CNMG 332E TM	CNMG090408E-TM		●	●	●	●	●		●	●	●					0.031	0.375	0.187	0.150
		CNMG 333E TM	CNMG090412E-TM		●	●	●	●	●		●	●	●					0.047	0.375	0.187	0.150
Finishing to medium cutting	ZM	CNMG 332E ZM	CNMG090408E-ZM		●	●												0.031	0.375	0.187	0.150
		CNMG 333E ZM	CNMG090412E-ZM		●	●												0.047	0.375	0.187	0.150
Medium cutting	SM	CNMG 331E SM	CNMG090404E-SM				●	●	●									0.016	0.375	0.187	0.150
		CNMG 332E SM	CNMG090408E-SM				●	●	●									0.031	0.375	0.187	0.150
		CNMG 333E SM	CNMG090412E-SM				●	●	●									0.047	0.375	0.187	0.150
Finishing to medium cutting	-	CNMA 331E	CNMA090404E										●					0.016	0.375	0.187	0.150
		CNMA 332E	CNMA090408E										●					0.031	0.375	0.187	0.150
		CNMA 333E	CNMA090412E										●					0.047	0.375	0.187	0.150
		CNMA 334E	CNMA090416E										●					0.063	0.375	0.187	0.150

● : New product
● : Line up

ISO-EcoTurn

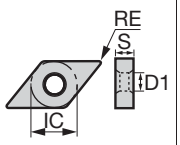
Insert NEGATIVE TYPE

● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

DN

Rhombic, 55° with hole

		T9205	T9215	T9225	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●ɔ	ɔ✣	ɔ	✣	ɔ✣	✣	●ɔ				●ɔ	●ɔ			●ɔ
M	Stainless		●ɔ		●	ɔ	ɔ	✣	●ɔ	ɔ							
K	Cast iron	●ɔ	●ɔ						●ɔ		●ɔ	ɔ	●ɔ	●ɔ			●ɔ
N	Non-ferrous																
S	Superalloys								●ɔ	ɔ							
H	Hard materials																



Application	Chipbreaker	Designation Inch	Designation Metric	RE	IC	S	D1
Precision finishing	TF	DNMG 330.5E TF	DNMG110402E-TF	0.008	0.375	0.187	0.150
		DNMG 331E TF	DNMG110404E-TF	0.016	0.375	0.187	0.150
		DNMG 332E TF	DNMG110408E-TF	0.031	0.375	0.187	0.150
Finishing	TSF	DNMG 330.5E TSF	DNMG110402E-TSF	0.008	0.375	0.187	0.150
		DNMG 331E TSF	DNMG110404E-TSF	0.016	0.375	0.187	0.150
		DNMG 332E TSF	DNMG110408E-TSF	0.031	0.375	0.187	0.150
		DNMG 333E TSF	DNMG110412E-TSF	0.047	0.375	0.187	0.150
	TS	DNMG 330.5E TS	DNMG110402E-TS	0.008	0.375	0.187	0.150
		DNMG 331E TS	DNMG110404E-TS	0.016	0.375	0.187	0.150
		DNMG 332E TS	DNMG110408E-TS	0.031	0.375	0.187	0.150
Finishing (wiper)	FW	DNMG 331E FW	DNMG110404E-FW	0.016	0.375	0.187	0.150
		DNMG 332E FW	DNMG110408E-FW	0.031	0.375	0.187	0.150
			* Wiper				
Finishing	ZF	DNMG 331E ZF	DNMG110404E-ZF	0.016	0.375	0.187	0.150
		DNMG 332E ZF	DNMG110408E-ZF	0.031	0.375	0.187	0.150
Finishing to medium cutting (wiper)	SW	DNMG 332E SW	DNMG110408E-SW	0.031	0.375	0.187	0.150
		DNMG 333E SW	DNMG110412E-SW	0.047	0.375	0.187	0.150
			* Wiper				

* Please contact our sales representative for your inquiries about the program adjustment when using SW/FW for machining of radius shape or taper machining.

● : New product
● : Line up

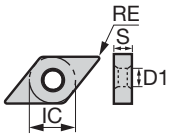
Insert NEGATIVE TYPE

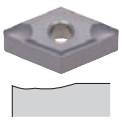
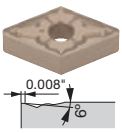
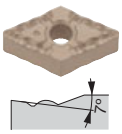
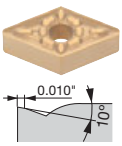
● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

DN

Rhombic, 55° with hole

P	Steel	●	●◐	◐✣	◐	✣	◐✣	✣	●◐				●◐	●◐			●◐						
M	Stainless		●◐		●	◐	◐	✣	●◐	◐													
K	Cast iron	●◐	●◐						●◐		●◐	◐	●◐	●◐			●◐						
N	Non-ferrous																						
S	Superalloys								●◐	◐													
H	Hard materials																						



Application	Chipbreaker	Designation Inch	Designation Metric	Coated T9205	T9215	T9225	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	Coated cermet GT9530	AT9530	Cermet NS9530	Dimension (in) RE	IC	S	D1
Finishing	**SS**	**DNMG 331E SS**	**DNMG110404E-SS**						●	●								0.016	0.375	0.187	0.150
		**DNMG 332E SS**	**DNMG110408E-SS**						●	●								0.031	0.375	0.187	0.150
Medium cutting	**TM**	**DNMG 331E TM**	**DNMG110404E-TM**		●	●					●	●						0.016	0.375	0.187	0.150
		**DNMG 332E TM**	**DNMG110408E-TM**		●	●					●	●						0.031	0.375	0.187	0.150
		DNMG 333E TM	**DNMG110412E-TM**		●	●					●	●						0.047	0.375	0.187	0.150
Finishing to medium cutting	**ZM**	**DNMG 332E ZM**	**DNMG110408E-ZM**		●	●												0.031	0.375	0.187	0.150
		**DNMG 333E ZM**	**DNMG110412E-ZM**		●	●												0.047	0.375	0.187	0.150
Medium cutting	**SM**	**DNMG 331E SM**	**DNMG110404E-SM**				●	●	●									0.016	0.375	0.187	0.150
		**DNMG 332E SM**	**DNMG110408E-SM**				●	●	●									0.031	0.375	0.187	0.150
Finishing to medium cutting	**-**	**DNMA 331E**	**DNMA110404E**										●					0.016	0.375	0.187	0.150
		**DNMA 332E**	**DNMA110408E**										●					0.031	0.375	0.187	0.150
		DNMA 333E	**DNMA110412E**										●					0.047	0.375	0.187	0.150

● : New product
● : Line up

ISO-EcoTurn

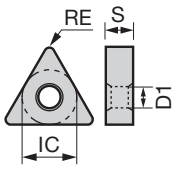
Insert NEGATIVE TYPE

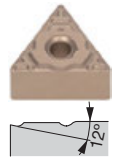
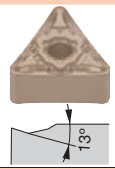
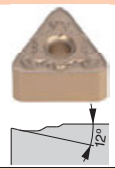
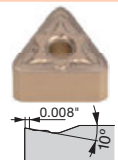
● : Continuous cutting
ɔ : Light interrupted cutting
✣ : Heavy interrupted cutting

TN

Triangular, 60° with hole

P	Steel	● ●ɔ ɔ✣ ɔ ✣ ɔ✣ ✣ ●ɔ
M	Stainless	●ɔ ● ɔ ɔ ✣ ●ɔ ɔ
K	Cast iron	●ɔ ●ɔ ●ɔ ●ɔ ɔ
N	Non-ferrous	
S	Superalloys	●ɔ ɔ
H	Hard materials	



Application	Chipbreaker	Designation Inch	Designation Metric	Coated T9205	Coated T9215	Coated T9225	Coated T6120	Coated T6130	Coated AH630	Coated AH645	Coated AH120	Coated AH8015	Coated T515	Coated T5115	Coated cermet GT9530	Coated cermet AT9530	Cermet NS9530	Dimension (in) RE	IC	S	D1
Precision finishing	**TF**	**TNMG 230.5E TF**	**TNMG110402E-TF**		●	●											●	0.008	0.250	0.187	0.089
		**TNMG 231E TF**	**TNMG110404E-TF**		●	●											●	0.016	0.250	0.187	0.089
		TNMG 232E TF	**TNMG110408E-TF**		●	●											●	0.031	0.250	0.187	0.089
Finishing	**TSF**	**TNMG 230.5E TSF**	**TNMG110402E-TSF**		●	●									●		●	0.008	0.250	0.187	0.089
		**TNMG 231E TSF**	**TNMG110404E-TSF**		●	●									●	●	●	0.016	0.250	0.187	0.089
		TNMG 232E TSF	**TNMG110408E-TSF**		●	●									●	●	●	0.031	0.250	0.187	0.089
Finishing (wiper)	**FW**	**TNMG 231E FW**	**TNMG110404E-FW**		●													0.016	0.250	0.187	0.089
		**TNMG 232E FW**	**TNMG110408E-FW**		●													0.031	0.250	0.187	0.089
			* Wiper																		
Finishing to medium cutting (wiper)	**SW**	**TNMG 232E SW**	**TNMG110408E-SW**		●													0.031	0.250	0.187	0.089
		**TNMG 233E SW**	**TNMG110412E-SW**		●													0.047	0.250	0.187	0.089
			* Wiper																		

* Please contact our sales representative for your inquiries about the program adjustment when using SW/FW for machining of radius shape or taper machining.

● : New product
● : Line up

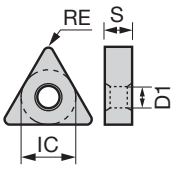
Insert NEGATIVE TYPE

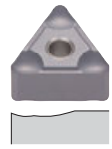
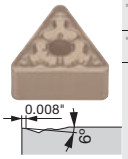
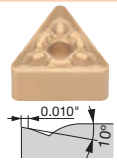
● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

TN

Triangular, 60° with hole

		T9205	T9215	T9225	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●◐	◐✣	◐	✣	◐✣	✣	●◐				●◐	●◐	●◐
M	Stainless		●◐		●	◐	◐	✣	●◐	◐					
K	Cast iron	●◐	●◐						●◐		●◐	◐	●◐	●◐	●◐
N	Non-ferrous														
S	Superalloys								●◐	◐					
H	Hard materials														



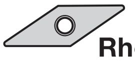
Application	Chipbreaker	Designation Inch	Designation Metric	Coated											Coated cermet			Cermet			Dimension (in)			
				T9205	T9215	T9225	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530		NS9530			RE	IC	S	D1
Finishing	SS	TNMG 231E SS	TNMG110404E-SS						●	●											0.016	0.250	0.187	0.089
		TNMG 232E SS	TNMG110408E-SS						●	●											0.031	0.250	0.187	0.089
Medium cutting	TM	TNMG 231E TM	TNMG110404E-TM		●	●															0.016	0.250	0.187	0.089
		TNMG 232E TM	TNMG110408E-TM		●	●															0.031	0.250	0.187	0.089
		TNMG 233E TM	TNMG110412E-TM		●	●															0.047	0.250	0.187	0.089
	SM	TNMG 231E SM	TNMG110404E-SM				●	●	●												0.016	0.250	0.187	0.089
		TNMG 232E SM	TNMG110408E-SM				●	●	●												0.031	0.250	0.187	0.089
Finishing to medium cutting	-	TNMA 231E	TNMA110404E										●								0.016	0.250	0.187	0.089
		TNMA 232E	TNMA110408E										●								0.031	0.250	0.187	0.089
		TNMA 233E	TNMA110412E										●								0.047	0.250	0.187	0.089

● : Line up

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

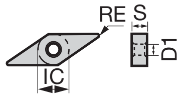
Insert NEGATIVE TYPE

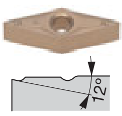
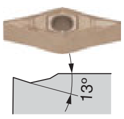
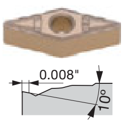
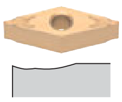
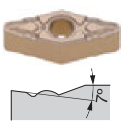
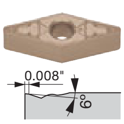
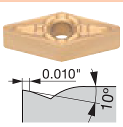
VN



Rhombic, 35° with hole

	Material	T9205	T9215	T9225	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	GT9530	AT9530	NS9530
P	Steel	●	●◐	◐✠	◐	✠	◐✠	✠	●◐				●◐	●◐	●◐
M	Stainless		●◐		●	◐	◐	✠	●◐	◐					
K	Cast iron	●◐	●◐						●◐		●◐	◐	●◐	●◐	●◐
N	Non-ferrous														
S	Superalloys								●◐	◐					
H	Hard materials														



Application	Chipbreaker	Designation Inch	Designation Metric	Coated T9205	Coated T9215	Coated T9225	Coated T6120	Coated T6130	Coated AH630	Coated AH645	Coated AH120	Coated AH8015	Coated T515	Coated T5115	Coated cermet GT9530	Coated cermet AT9530	Cermet NS9530	RE	IC	S	D1
Precision finishing	TF	VNMG 2.330.5E	VNMG120402E-TF		●	●											🔴	0.008	0.281	0.187	0.150
		VNMG 2.331E TF	VNMG120404E-TF		●	●											🔴	0.016	0.281	0.187	0.150
		VNMG 2.332E TF	VNMG120408E-TF		●	●											🔴	0.031	0.281	0.187	0.150
Finishing	TSF	VNMG 2.330.5E TSF	VNMG120402E-TSF		●	●									●	●	●	0.008	0.281	0.187	0.150
		VNMG 2.331E TSF	VNMG120404E-TSF		●	●									●	●	●	0.016	0.281	0.187	0.150
		VNMG 2.332E TSF	VNMG120408E-TSF		●	●									●	●	●	0.031	0.281	0.187	0.150
	ZF	VNMG 2.331E ZF	VNMG120404E-ZF		🔴	🔴												0.016	0.281	0.187	0.150
		VNMG 2.332E ZF	VNMG120408E-ZF		🔴	🔴												0.031	0.281	0.187	0.150
	SS	VNMG 2.331E SS	VNMG120404E-SS				●	●	●	●								0.016	0.281	0.187	0.150
		VNMG 2.332E SS	VNMG120408E-SS				●	●	●	●								0.031	0.281	0.187	0.150
Finishing to medium cutting	ZM	VNMG 2.332E ZM	VNMG120408E-ZM		🔴	🔴												0.031	0.281	0.187	0.150
		VNMG 2.333E ZM	VNMG120412E-ZM		🔴	🔴												0.047	0.281	0.187	0.150
Medium cutting	TM	VNMG 2.331E TM	VNMG120404E-TM		●	●												0.016	0.281	0.187	0.150
		VNMG 2.332E TM	VNMG120408E-TM		●	●												0.031	0.281	0.187	0.150
		VNMG 2.333E TM	VNMG120412E-TM		🔴	🔴												0.047	0.281	0.187	0.150
	SM	VNMG 2.331E SM	VNMG120404E-SM				●	●	●	●								0.016	0.281	0.187	0.150
		VNMG 2.332E SM	VNMG120408E-SM				●	●	●	●								0.031	0.281	0.187	0.150
Finishing to medium cutting	-	VNMA 2.331E	VNMA120404E										●					0.016	0.281	0.187	0.150
		VNMA 2.332E	VNMA120408E										●					0.031	0.281	0.187	0.150

🔴 : New product
● : Line up

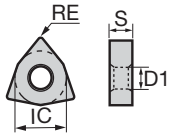
Insert NEGATIVE TYPE

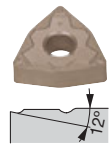
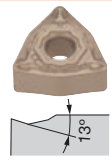
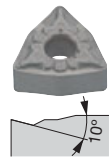
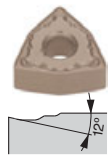
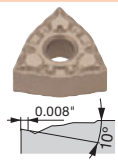
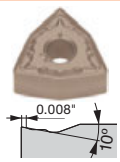
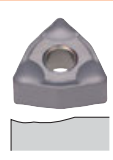
● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

WN

Trigon, 80° with hole

P	Steel	●	●◐	◐✣	◐	✣	◐✣	✣	●◐				●◐	●◐			●◐				
M	Stainless		●◐		●	◐	◐	✣	●◐	◐											
K	Cast iron	●◐	●◐						●◐		●◐	◐	●◐	●◐			●◐				
N	Non-ferrous																				
S	Superalloys								●◐	◐											
H	Hard materials																				



Application	Chipbreaker	Designation Inch	Designation Metric	Coated T9205	T9215	T9225	T6120	T6130	AH630	AH645	AH120	AH8015	T515	T5115	Coated cermet GT9530	AT9530	Cermet NS9530	Dimension (in) RE	IC	S	D1
Precision finishing	TF	WNMG 330.5E TF	WNMG060402E-TF		●	●											●	0.008	0.375	0.187	0.150
		WNMG 331E TF	WNMG060404E-TF		●	●											●	0.016	0.375	0.187	0.150
		WNMG 332E TF	WNMG060408E-TF		●	●											●	0.031	0.375	0.187	0.150
Finishing	TSF	WNMG 330.5E TSF	WNMG060402E-TSF		●	●					●	●			●		●	0.008	0.375	0.187	0.150
		WNMG 331E TSF	WNMG060404E-TSF		●	●					●	●			●	●	●	0.016	0.375	0.187	0.150
		WNMG 332E TSF	WNMG060408E-TSF		●	●					●	●			●	●	●	0.031	0.375	0.187	0.150
		WNMG 333E TSF	WNMG060412E-TSF		●	●					●	●			●		●	0.047	0.375	0.187	0.150
	TS	WNMG 330.5E TS	WNMG060402E-TS												●		●	0.008	0.375	0.187	0.150
		WNMG 331E TS	WNMG060404E-TS												●		●	0.016	0.375	0.187	0.150
		WNMG 332E TS	WNMG060408E-TS												●		●	0.031	0.375	0.187	0.150
Finishing (wiper)	FW	WNMG 331E FW	WNMG060404E-FW	●	●	●									●		●	0.016	0.375	0.187	0.150
		WNMG 332E FW	WNMG060408E-FW	●	●	●									●		●	0.031	0.375	0.187	0.150
			* Wiper																		
Finishing	ZF	WNMG 331E ZF	WNMG060404E-ZF		●	●												0.016	0.375	0.187	0.150
		WNMG 332E ZF	WNMG060408E-ZF		●	●												0.031	0.375	0.187	0.150
Finishing to medium cutting (wiper)	SW	WNMG 332E SW	WNMG060408E-SW	●	●	●								●				0.031	0.375	0.187	0.150
		WNMG 333E SW	WNMG060412E-SW	●	●	●								●				0.047	0.375	0.187	0.150
			* Wiper																		
Finishing	SS	WNMG 331E SS	WNMG060404E-SS						●	●								0.016	0.375	0.187	0.150
		WNMG 332E SS	WNMG060408E-SS						●	●								0.031	0.375	0.187	0.150
		WNMG 333E SS	WNMG060412E-SS						●	●								0.047	0.375	0.187	0.150

* Please contact our sales representative for your inquiries about the program adjustment when using SW/FW for machining of radius shape or taper machining.

● : New product
● : Line up

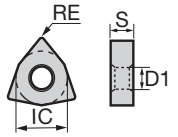
Insert NEGATIVE TYPE

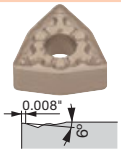
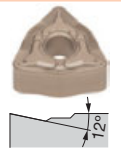
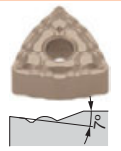
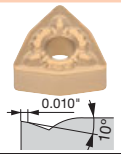
● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

WN

Trigon, 80° with hole

P	Steel	●	●ⓒ	●✣	ⓒ	✣	ⓒ✣	✣	●ⓒ				●ⓒ	●ⓒ			●ⓒ				
M	Stainless		●ⓒ		●	ⓒ	ⓒ	✣	●ⓒ	ⓒ											
K	Cast iron	●ⓒ	●ⓒ						●ⓒ		●ⓒ	ⓒ	●ⓒ	●ⓒ			●ⓒ				
N	Non-ferrous																				
S	Superalloys								●ⓒ	ⓒ											
H	Hard materials																				



Application	Chipbreaker	Designation Inch	Designation Metric	Coated T9205	Coated T9215	Coated T9225	Coated T6120	Coated T6130	Coated AH630	Coated AH645	Coated AH120	Coated AH8015	Coated T515	Coated T5115	Coated cermet GT9530	Coated cermet AT9530	Cermet NS9530	Dimension (in) RE	IC	S	D1
Medium cutting	TM	WNMG 331E TM	WNMG060404E-TM		●	●					●	●						0.016	0.375	0.187	0.150
		WNMG 332E TM	WNMG060408E-TM		●	●					●	●						0.031	0.375	0.187	0.150
		WNMG 333E TM	WNMG060412E-TM		●	●					●	●						0.047	0.375	0.187	0.150
Finishing to medium cutting	NM	WNMG 333E NM	WNMG060412E-NM			●												0.047	0.375	0.187	0.150
																					
	ZM	WNMG 332E ZM	WNMG060408E-ZM		●	●												0.031	0.375	0.187	0.150
		WNMG 333E ZF	WNMG060412E-ZM		●	●												0.047	0.375	0.187	0.150
Medium cutting	SM	WNMG 331E SM	WNMG060404E-SM				●	●	●									0.016	0.375	0.187	0.150
		WNMG 332E SM	WNMG060408E-SM				●	●	●									0.031	0.375	0.187	0.150
		WNMG 333E SM	WNMG060412E-SM				●	●	●									0.047	0.375	0.187	0.150
Finishing to medium cutting	-	WNMA 331E	WNMA060404E										●					0.016	0.375	0.187	0.150
		WNMA 332E	WNMA060408E										●					0.031	0.375	0.187	0.150
		WNMA 333E	WNMA060412E										●					0.047	0.375	0.187	0.150
		WNMA 334E	WNMA060416E										●					0.063	0.375	0.187	0.150

● : New product
● : Line up

Mar. 2021 (TJ)

Member IMC Group
Tungaloy
INDUSTRY 4.0

TurnLine
Expansion 3

ISOTURN

Tungaloy Report No. 426S3-US

Introducing GNMG and FNMG inserts

TUNGALOY ADDFORCE ACCELERATED LINES

ISOEcoTURN

For more information

New **GNMG** and **FNMG** insert shapes for **ISO-EcoTurn**, an economical insert series

Innovative insert designs with reduced corner angles for better chip control and machining stability

- **GNMG33** insert with **70° corners**: good alternative to CNMG with 80° corners

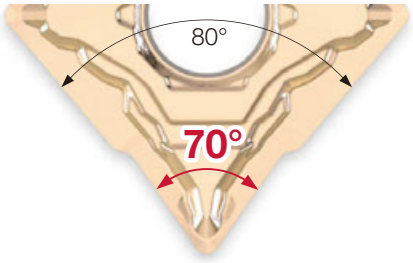
- **FNMG33** insert with **45° corners**: good alternative to DNMG with 55° corners

- 70° and 45° corner angles provide the inserts with larger clearances with the workpiece

- Better chip control and chip flow generated by larger clearances of the insert side and end eliminate part damage. In addition, reduced corner angles help reduce the radial force that acts on the insert during machining, eliminating chatter, while providing stability

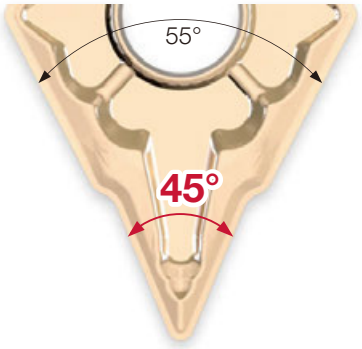
New **GNMG** type

Corner angle: **70°**



New **FNMG** type

Corner angle: **45°**

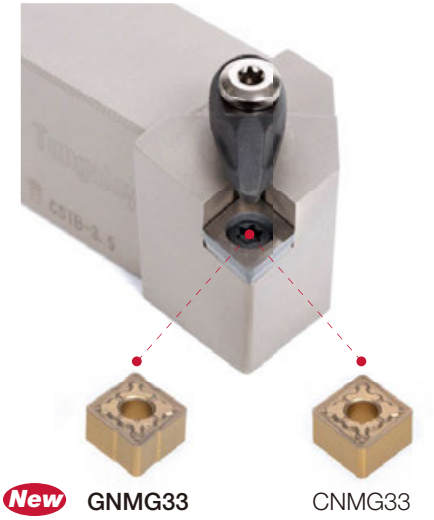


Versatility and economy

- The new inserts can be used with existing **ISO-EcoTurn** toolholders for CNMG33 or DNMG33

- **ISO-EcoTurn** decreases cost per insert on the production line without compromising insert performance

- Three types of insert grades are available for machining of a wide range of materials



New **GNMG33** CNMG33

CUTTING PERFORMANCE

1. Excellent chip control during profiling (longitudinal turning and outward face turning)

New **FNMG** type
Corner angle: **45°**

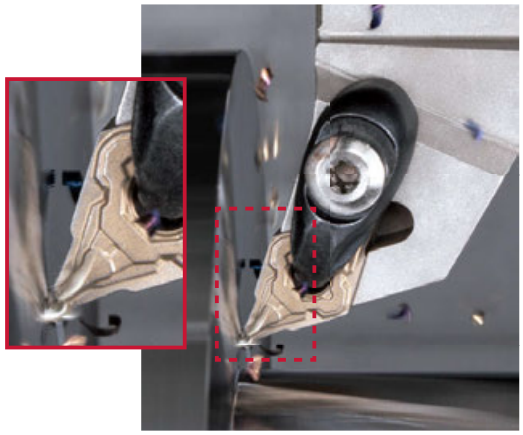
DNMG type
Corner angle: 55°

GNMG and **FNMG** inserts provide larger clearances for low cutting force and excellent chip control during profile machining.

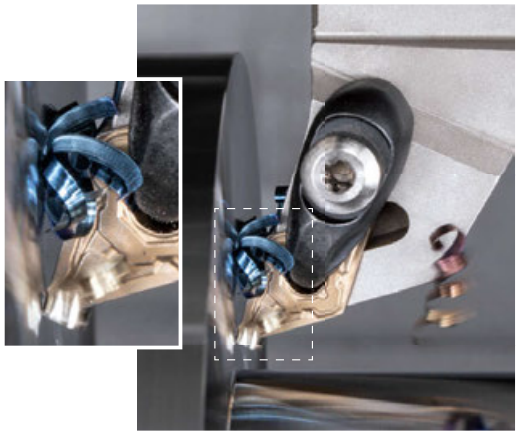
P

Toolholder	: ADJNL1633-A
Insert	: FNMG331E-TSF T9215
	DNMG331E-TSF T9215
Workpiece material	: 4140
Cutting speed	: ① *Vc* = 820 sfm, ② *Vc* = 490 sfm
Feed	: ① *f* = 0.012 ipr, ② *f* = 0.010 ipr
Depth of cut	: ① *ap* = 0.020", ② *ap* = 0.010"
Machining	: ① External turning, ② Face turning
Coolant	: Dry

2. Excellent chip evacuation during face turning



New **FNMG** type
Corner angle: **45°**



DNMG type
Corner angle: 55°

GNMG and **FNMG** inserts provide larger clearances for the chips to smoothly flow and evacuate out of the cutting zone. This significantly reduces chip re-cutting when the insert is fed in any direction.

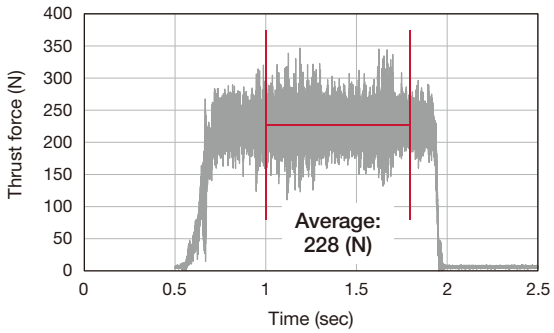
P

Toolholder	: ADQNL1633-A
Insert	: FNMG331E-TSF T9215
	DNMG331E-TSF T9215
Workpiece material	: 4140
Cutting speed	: *Vc* = 490 sfm
Feed	: *f* = 0.010 ipr
Depth of cut	: *ap* = 0.010"
Machining	: Face turning
Coolant	: Dry

3. Cutting force (thrust force)

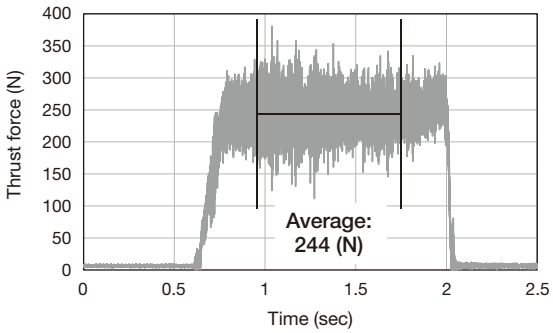
New GNMG type

Corner angle: **70°**



CNMG type

Corner angle: 80°



Reduced corner angles of **GNMG** and **FNMG** inserts enable less cutting contact with the workpiece. This lowers the radial cutting force that applies on the insert during machining, eliminating chatter, while improving machining stability.

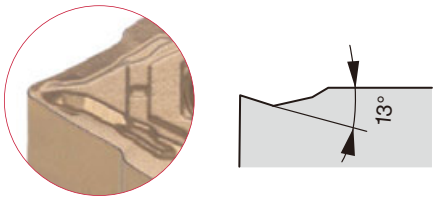
P

Toolholder	: ACLNR1633-A
Insert	: **G**NMG332**E**-TM T9215
	CNMG332**E**-TM T9215
Workpiece material	: 4140
Cutting speed	: *Vc* = 980 sfm
Feed	: *f* = 0.008 ipr
Depth of cut	: *ap* = 0.118"
Machining	: External turning
Coolant	: Dry

APPLICATION AREA

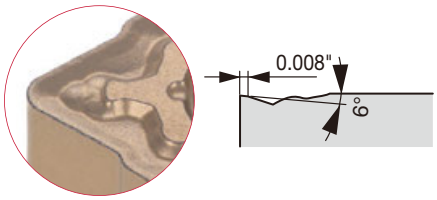
TSF chipbreaker

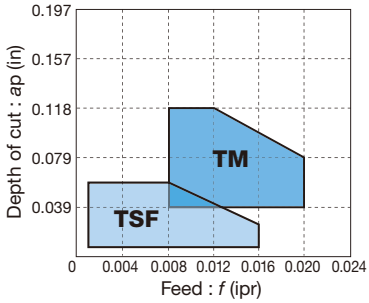
Excellent chip control and low cutting force geometry for finish machining.



TM chipbreaker

Excellent chip control and stable machining for medium machining.



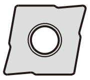


GRADES

Grade	Recommended workpiece material	Feature
PREMIUMTEC T9215	P M K	- Well-balanced between wear and chipping resistance - First choice for steel - High versatility for a wide range of applications
PREMIUMTEC T9225	P	- First choice for roughing to medium cutting - High fracture resistance
PREMIUMTEC AH8015	P M K S	- PVD coated grade with a balanced resistance to wear and fracture - First choice for stainless steel and heat-resistant superalloys

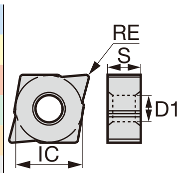
● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

GN

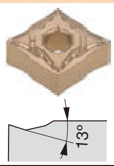


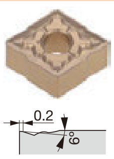
Rhombic, 70°
with hole

	Material	T9215	T9225	AH8015
P	Steel	●◐	◐✣	
M	Stainless	●◐		◐
K	Cast iron	●◐		
N	Non-ferrous			
S	Superalloys			◐
H	Hard materials			



Application	Chipbreaker	Designation Inch	Designation Metric	Coated T9215	Coated T9225	Coated AH8015	Dimension (in) RE	IC	S	D1
Finishing	TSF	GNMG 330.5E TSF	GNMG090402E-TSF	●	●	●	0.008	0.375	0.187	0.150
		GNMG 331E TSF	GNMG090404E-TSF	●	●	●	0.016	0.375	0.187	0.150
		GNMG 332E TSF	GNMG090408E-TSF	●	●	●	0.032	0.375	0.187	0.150
Medium cutting	TM	GNMG 331E TM	GNMG090404E-TM	●	●	●	0.016	0.375	0.187	0.150
		GNMG 332E TM	GNMG090408E-TM	●	●	●	0.032	0.375	0.187	0.150
		GNMG 333E TM	GNMG090412E-TM	●	●	●	0.047	0.375	0.187	0.150

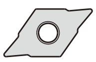




Make sure to offset the cutting edge position after insert change.
Do not use ISO-EcoTurn cartridge set for CNMG33 (AD-CL-4/3-SET or -SET-S) with GNMG33 insert.
The insert may move during machining.

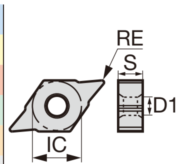
● : New product

FN

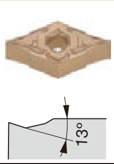


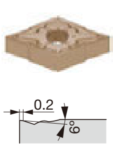
Rhombic, 45°
with hole

	Material	T9215	T9225	AH8015
P	Steel	●◐	◐✣	
M	Stainless	●◐		◐
K	Cast iron	●◐		
N	Non-ferrous			
S	Superalloys			◐
H	Hard materials			



Application	Chipbreaker	Designation Inch	Designation Metric	Coated T9215	Coated T9225	Coated AH8015	Dimension (in) RE	IC	S	D1
Finishing	TSF	FNMG 330.5E TSF	FNMG110402E-TSF	●	●	●	0.008	0.375	0.187	0.150
		FNMG 331E TSF	FNMG110404E-TSF	●	●	●	0.016	0.375	0.187	0.150
		FNMG 332E TSF	FNMG110408E-TSF	●	●	●	0.032	0.375	0.187	0.150
		FNMG 333E TSF	FNMG110412E-TSF	●	●	●	0.047	0.375	0.187	0.150
Medium cutting	TM	FNMG 331E TM	FNMG110404E-TM	●	●	●	0.016	0.375	0.187	0.150
		FNMG 332E TM	FNMG110408E-TM	●	●	●	0.032	0.375	0.187	0.150
		FNMG 333E TM	FNMG110412E-TM	●	●	●	0.047	0.375	0.187	0.150





Make sure to offset the cutting edge position after insert change.
Please note that the insert shim may interfere with the workpiece when FNMG insert is used with Q-style toolholder to undercut a work diameter of 1.969" or smaller.

● : New product

ISOEcoTURN

STANDARD CUTTING CONDITIONS

ISO	Operation	Chipbreaker	Grade	Depth of cut *ap* (in)	Feed *f* (ipr)	Cutting speed: *Vc* (sfm)		
						Low carbon steel, alloy steel	Medium carbon steel, alloy steel	High carbon steel, alloy steel
P	Finishing	TSF	T9215	0.008 - 0.059	0.003 - 0.016	492 - 1312	492 - 1312	394 - 984
			T9225	0.008 - 0.059	0.003 - 0.016	394 - 984	394 - 984	328 - 820
	Medium cutting	TM	T9215	0.039 - 0.118	0.008 - 0.020	492 - 1312	492 - 1312	394 - 984
			T9225	0.039 - 0.118	0.008 - 0.020	394 - 984	394 - 984	328 - 820
						Stainless steel		
M	Finishing	TSF	T9215	0.008 - 0.059	0.003 - 0.016		328 - 820	
			T9225	0.008 - 0.059	0.003 - 0.016		328 - 820	
			AH8015	0.008 - 0.059	0.003 - 0.016		295 - 623	
	Medium cutting	TM	T9215	0.039 - 0.118	0.008 - 0.020		328 - 820	
			T9225	0.039 - 0.118	0.008 - 0.020		328 - 820	
			AH8015	0.039 - 0.118	0.008 - 0.020		295 - 623	
						Cast iron		
K	Finishing	TSF	T9215	0.008 - 0.059	0.003 - 0.016		459 - 1640	
			T9225	0.008 - 0.059	0.003 - 0.016		459 - 1640	
	Medium cutting	TM	T9215	0.039 - 0.118	0.008 - 0.020		459 - 1640	
			T9225	0.039 - 0.118	0.008 - 0.020		459 - 1640	
						Heat-resistant alloys		
S	Finishing	TSF	AH8015	0.008 - 0.059	0.003 - 0.016		66 - 262	
	Medium cutting	TM	AH8015	0.039 - 0.118	0.008 - 0.020		66 - 262	

MEMO

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TUNGALOY ATLAS

Dr. Carbide Tungaloy

Aug. 2021 (TJ)