TurnLine

FW & SW

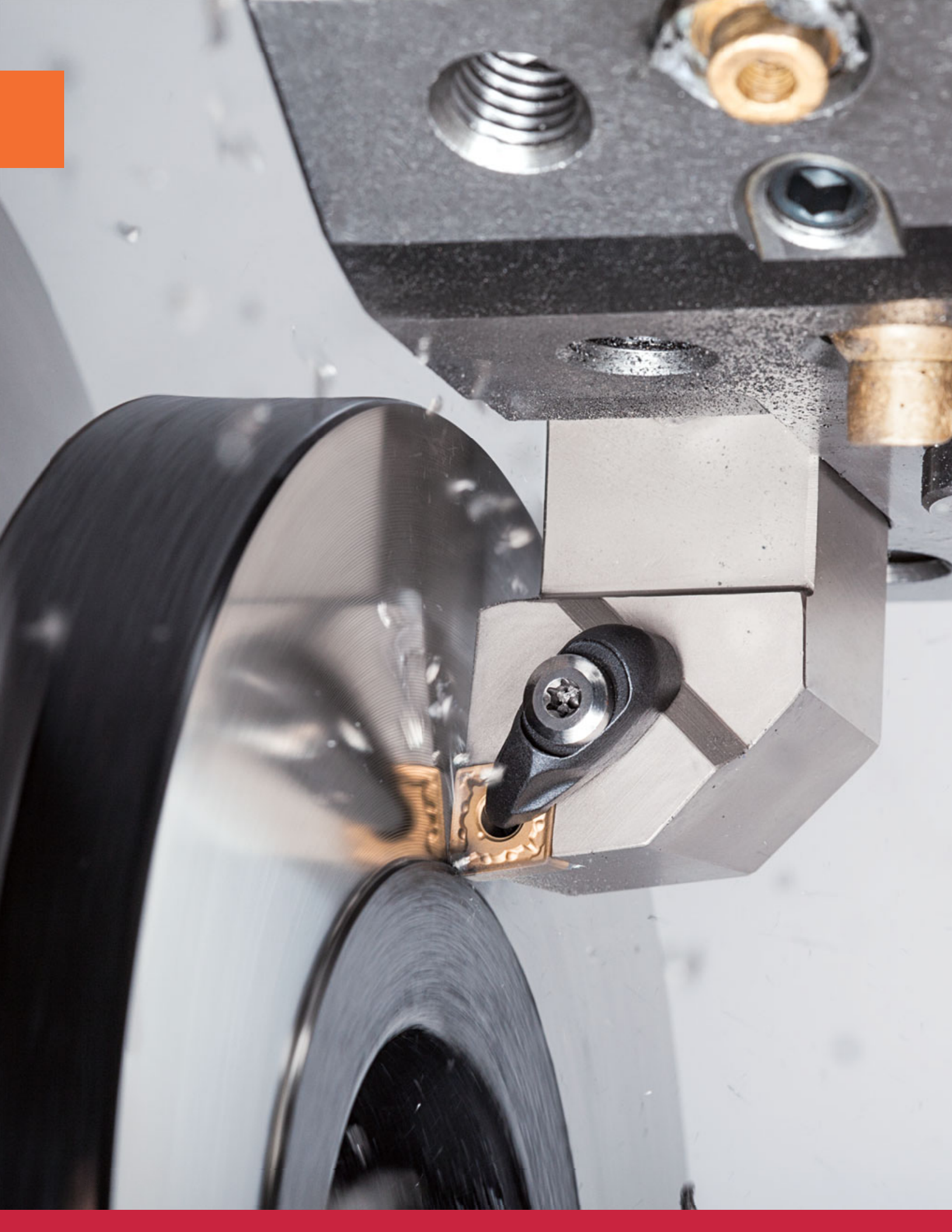
www.tungaloyamerica.com

Tungaloy Report No. 434-US

New wiper insert series
for advanced turning operations

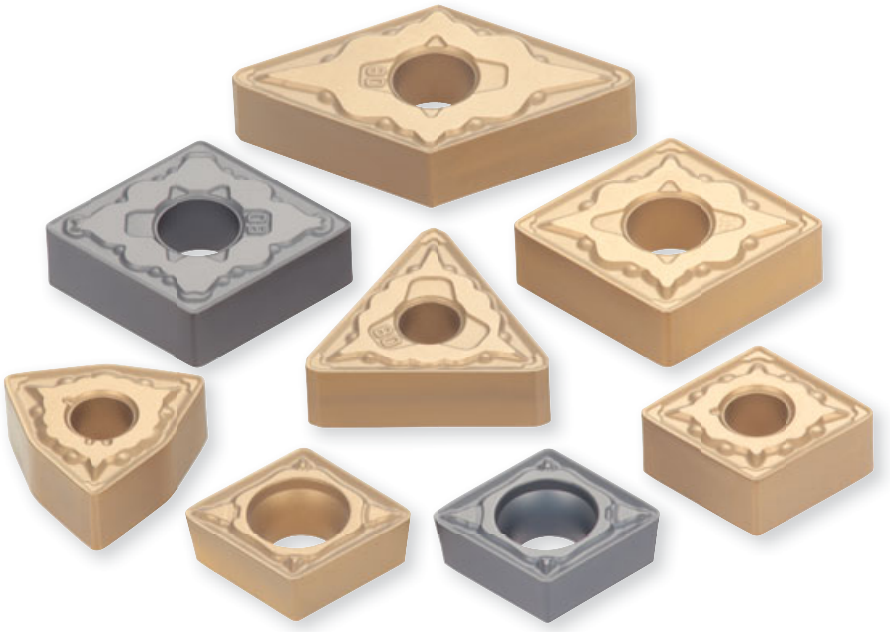
Member IMC Group

Tungaloy



TurnLine

FW & SW



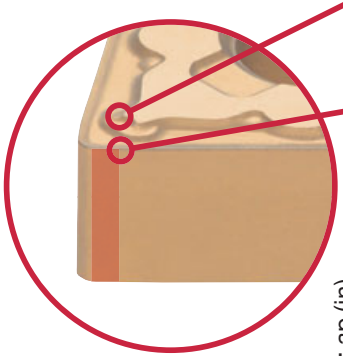
Only half the surface roughness even at doubled feed rate compared to regular ISO insert without wiper

Highly efficient machining due to uniquely designed wiper shape

New chipbreakers with wiper edge

FW *Finishing*

P



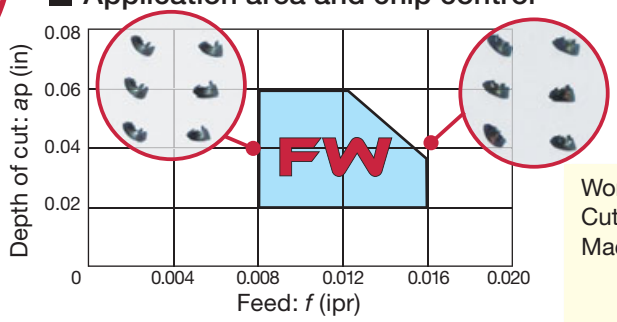
Stable chip control

Newly designed “Two-Stage Protrusion” offers stable chip control in machining with low depth of cut

Excellent surface finish

Wiper edge with radius shape provides good surface quality

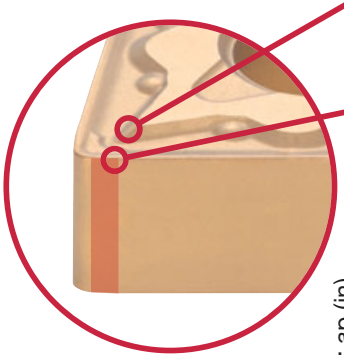
■ Application area and chip control



Workpiece	: 1045
Cutting speed	: *Vc* = 820 sfm
Machining	: External turning (Continuous cutting)

SW *Finishing to medium cutting*

P K



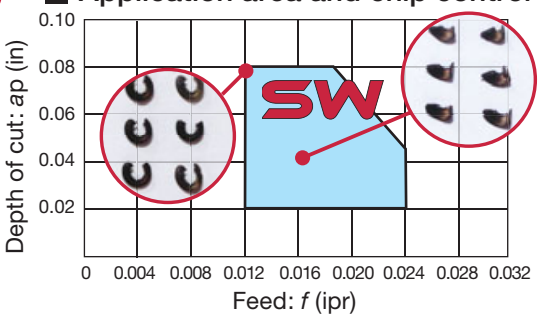
Stable chip control

Newly developed “Two-Stage bottom” design provides stable chip control in a wide range of depth of cut

Excellent surface finish

Wiper edge with radius shape provides good surface quality even at high feed

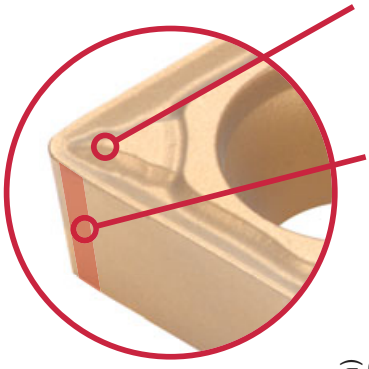
■ Application area and chip control



Workpiece	: 1045
Cutting speed	: *Vc* = 820 sfm
Machining	: External turning (Continuous cutting)

New chipbreakers with wiper edge

SW *For medium to finish cutting* **P**



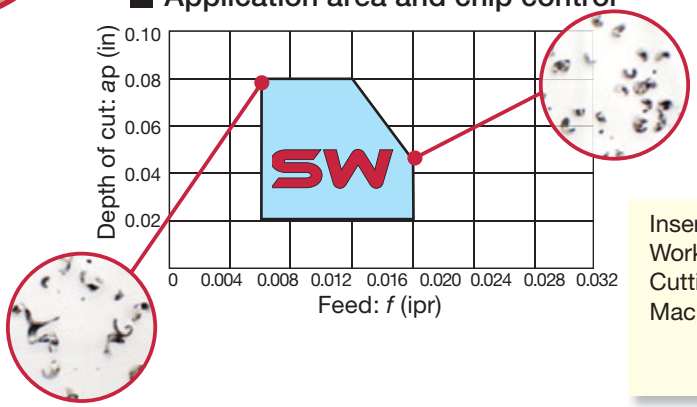
Protrusion

Newly designed protrusion improves chip control.

Wiper edge with radius shape

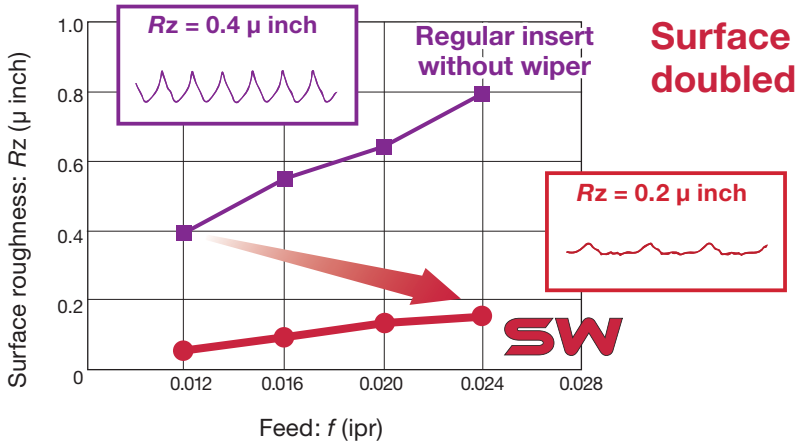
Increases feed rate and delivers excellent surface finish due to uniquely designed wiper edge in radius shape.

■ Application area and chip control



Insert	: CCMT09T308-SW
Workpiece	: 1045
Cutting speed	: *Vc* = 492 sfm
Machining	: External turning (Continuous cutting)

Excellent surface roughness



Surface roughness is 50% with doubled feed rate!!

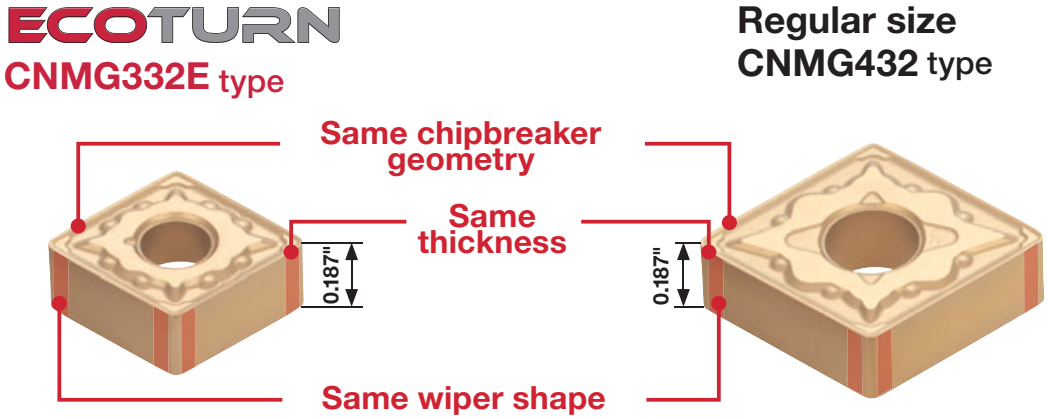
Insert	: CNMG432-SW
Workpiece	: 1045
Cutting speed	: *Vc* = 820 sfm
Depth of cut	: *ap* = 0.04"
Machining	: External turning (Continuous cutting)

Wiper edge on small-sized Eco inserts

Wiper inserts are available in EcoTurn series

ECOTURN TUNGALOY

Downsized inserts with the same thickness and chipbreaker geometry as regular-sized inserts.



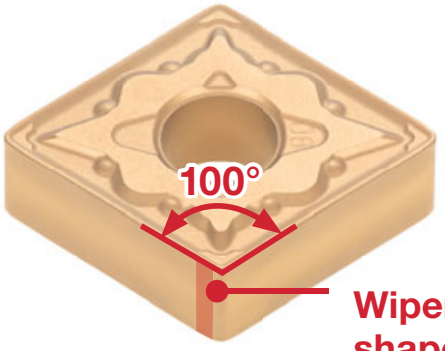
Incredible productivity with high-pressure coolant system

Wiper insert on TungJet improves productivity and provides good surface quality in machining at high speed and feed.

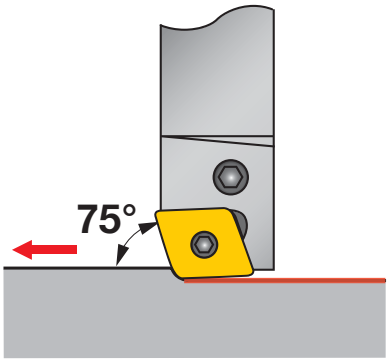
TUNGTURN JET TUNGALOY

Please refer to Tungaloy Report No.432 for the details of TungTurn-Jet series.

Wiper edge on 100° corner of CNMG type insert

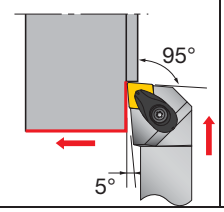
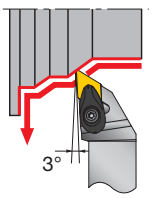
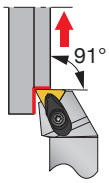
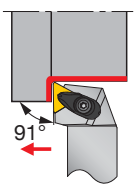
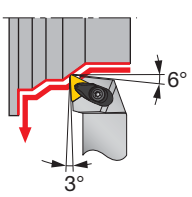


Wiper edge with radius shape on 100° corner



Toolholders for wiper inserts

Wiper edges are effective when used on specific toolholders with the appropriate angle of frontal cutting edge.

Insert shape	CNMG, WNMG CCMT	DNMG	TNMG
Cutting edge style	L 	J 	F  G  J 

For high-feed machining, Turning A series toolholders with double-clamping system are recommended.

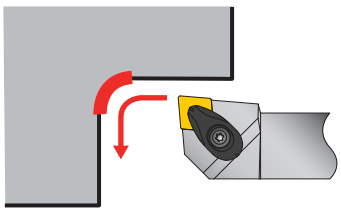
Cautions in using wiper inserts

Radius shape and chamfering
- Wiper edge is not effective
- **The adjustment is required in NC program**

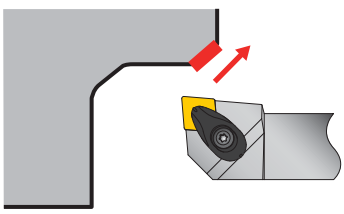
Value of adjustment for corner radius

Corner radius: r_ε (in)	0.016	0.032	0.048
Adjustment (in)	0.011	0.024	0.038

- Machining of radius shape



- Chamfering



The appropriate adjustment provides the same result as standard ANSI inserts.

INSERT NEGATIVE TYPE

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

Rhombic, 80° with hole

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

Application	Chipbreaker	Designation Inch	Designation Metric	Corner radius	Coated T9105	Coated T9115	Coated T9125	Coated T515	Coated T5115	Coated cermet GT9530	Cermet NS9530
Finishing (Wiper)	FW	CNMG 331E-FW	CNMG090404E-FW	0.016"	●	●	●			●	●
		CNMG 332E-FW	CNMG090408E-FW	0.031"	●	●	●			●	●
		CNMG 431 FW	CNMG120404-FW	0.016"		●				●	●
		CNMG 432 FW	CNMG120408-FW	0.031"	●	●	●			●	●
Finishing to medium cutting (Wiper)	SW	CNMG 332E-SW	CNMG090408E-SW	0.031"	●	●	●		●		
		CNMG 333E-SW	CNMG090412E-SW	0.047"	●	●	●		●		
		CNMG 432 SW	CNMG120408-SW	0.031"	●	●	●	●	●		
		CNMG 433 SW	CNMG120412-SW	0.047"	●	●	●	●	●		

Rhombic, 55° with hole

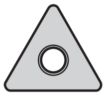
P	Steel	●ɔ
M	Stainless	
K	Cast iron	●ɔ
N	Non-ferrous	
S	Superalloys	
H	Hard materials	

Application	Chipbreaker	Designation Inch	Designation Metric	Corner radius	Coated T9115
Finishing (Wiper)	FW	DNMG 331E-FW	DNMG110404E-FW	0.016"	●
		DNMG 332E-FW	DNMG110408E-FW	0.031"	●
		DNMG 431 FW	DNMG150404-FW	0.016"	●
		DNMG 432 FW	DNMG150408-FW	0.031"	●
		DNMG 441 FW	DNMG150604-FW	0.016"	●
		DNMG 442 FW	DNMG150608-FW	0.031"	●
Finishing to medium cutting (Wiper)	SW	DNMG 332E-SW	DNMG110408E-SW	0.031"	●
		DNMG 333E-SW	DNMG110412E-SW	0.047"	●
		DNMG 432 SW	DNMG150408-SW	0.031"	●
		DNMG 433 SW	DNMG150412-SW	0.047"	●
		DNMG 442 SW	DNMG150608-SW	0.031"	●
		DNMG 443 SW	DNMG150612-SW	0.047"	●

● : Line up

INSERT NEGATIVE TYPE

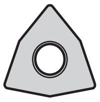
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting



Triangular, 60° with hole

	Work material	T9115
P	Steel	●
M	Stainless	
K	Cast iron	●◐
N	Non-ferrous	
S	Superalloys	
H	Hard materials	

Application	Chipbreaker	Designation Inch	Designation Metric	Corner radius	Coated: T9115
Finishing (Wiper)	FW	TNMG 231E-FW	TNMG110404E-FW	0.016"	●
		TNMG 232E-FW	TNMG110408E-FW	0.031"	●
		TNMG 332 FW	TNMG160404-FW	0.016"	●
		TNMG 333 FW	TNMG160408-FW	0.031"	●
Finishing to medium cutting (Wiper)	SW	TNMG 232E-SW	TNMG110408E-SW	0.031"	●
		TNMG 233E-SW	TNMG110412E-SW	0.047"	●
		TNMG 332 SW	TNMG160408-SW	0.031"	●
		TNMG 333 SW	TNMG160412-SW	0.047"	●



Trigon, 80° with hole

	Work material	T9105	T9115	T9125	T515	T5115	GT9530	NS9530
P	Steel	●	●◐	◐✠			●◐	●◐
M	Stainless							
K	Cast iron	●◐	●◐		●◐	◐	●◐	●◐
N	Non-ferrous							
S	Superalloys							
H	Hard materials							

Application	Chipbreaker	Designation Inch	Designation Metric	Corner radius	Coated: T9105	Coated: T9115	Coated: T9125	Coated: T515	Coated: T5115	Coated cermet: GT9530	Cermet: NS9530
Finishing (Wiper)	FW	WNMG 331E-FW	WNMG060404E-FW	0.016"	●	●	●			●	●
		WNMG 332E-FW	WNMG060408E-FW	0.031"	●	●	●			●	●
		WNMG 431 FW	WNMG080404-FW	0.016"		●	●			●	●
		WNMG 432 FW	WNMG080408-FW	0.031"	●	●	●			●	●
Finishing to medium cutting (Wiper)	SW	WNMG 332E-SW	WNMG060408E-SW	0.031"	●	●	●		●		
		WNMG 333E-SW	WNMG060412E-SW	0.047"	●	●	●		●		
		WNMG 432 SW	WNMG080408-SW	0.031"	●	●	●	●	●		
		WNMG 433 SW	WNMG080412-SW	0.047"		●	●	●	●		

● : Line up

INSERT POSITIVE TYPE

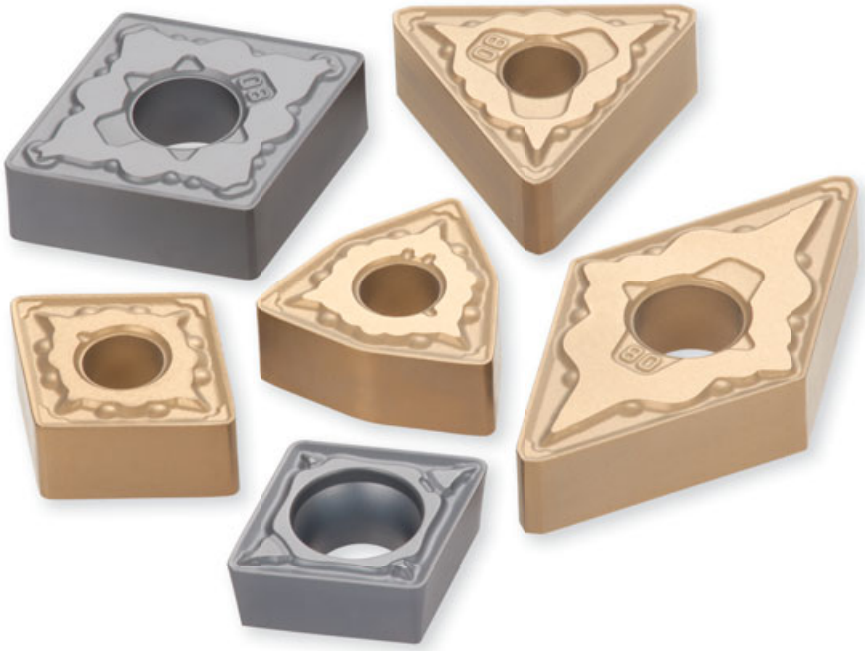
● : Continuous cutting
c : Light interrupted cutting
✣ : Heavy interrupted cutting

Rhombic, 80°
with hole
Positive 7°

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

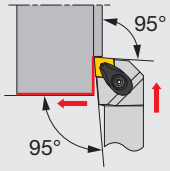
Application	Chipbreaker	Designation Inch	Designation Metric	Corner radius	Coated T9115	Coated T9125	Cermet NS9530
Finishing to medium cutting Wiper	**SW**	**CCMT21.51-SW**	**CCMT060204-SW**	0.016"	●	●	●
		CCMT21.52-SW	**CCMT060208-SW**	0.031"	●	●	●
		CCMT32.51-SW	**CCMT09T304-SW**	0.016"	●	●	●
		CCMT32.52-SW	**CCMT09T308-SW**	0.031"	●	●	●

● : Line-up

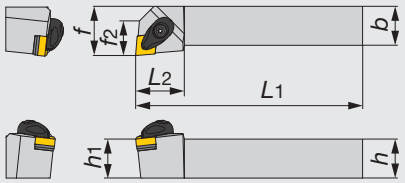


ACLNR/L

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



Cutting edge style **L**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
ACLNR/L1233-A	0.750	0.750	4.500	0.900	0.750	1.000	0.625	0.031	CN**33...	2.2
ACLNR/L1633-A	1.000	1.000	6.000	1.000	1.000	1.250	0.750	0.031	CN**33...	2.2
ACLNR/L124-A	0.750	0.750	4.500	1.000	0.750	1.000	0.750	0.031	CN**43...	2.2
ACLNR/L164-A	1.000	1.000	6.000	1.250	1.000	1.250	0.875	0.031	CN**43...	2.2

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
ACLNR/L2020K0904-A	20	20	125	25	20	25	18	0.8	CN**0904...	3
ACLNR/L2525M0904-A	25	25	150	25	25	32	18	0.8	CN**0904...	3
ACLNR/L2020K12-A	20	20	125	26	20	25	19	0.8	CN**1204...	3
ACLNR/L2525M12-A	25	25	150	30	25	32	21	0.8	CN**1204...	3
ACLNR/L3225P12-A	32	25	170	30	32	32	21	0.8	CN**1204...	3

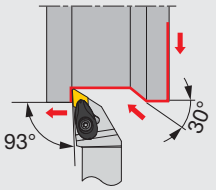
*Torque: Recommended torque (lbf·ft, N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS

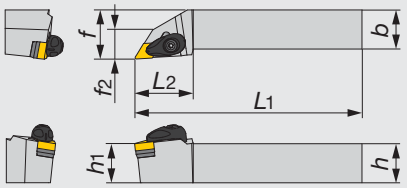
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
ACLNR/L**3-A, ACLNR/L**0904-A	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASC322	CSTB-3.5	T-15F
ACLNR/L**4-A, ACLNR/L**12-A	ACP4S	ACS-5W	BP-7	SP-2.5	ASC422	CSTB-3.5	T-15F

ADJNR/L

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



Cutting edge style **J**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
ADJNR/L1233-A	0.750	0.750	4.500	1.250	0.750	1.000	0.625	0.031	DN**33...	2.2
ADJNR/L1633-A	1.000	1.000	6.000	1.250	1.000	1.250	0.900	0.031	DN**33...	2.2
ADJNR/L124-A	0.750	0.750	4.500	1.500	0.750	1.000	0.750	0.031	DN**43...	2.2
ADJNR/L164-A	1.000	1.000	6.000	1.500	1.000	1.250	0.750	0.031	DN**43...	2.2
ADJNR/L204-A	1.250	1.250	7.000	1.500	1.250	1.500	1.000	0.031	DN**43...	2.2

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
ADJNR/L2020K1104-A	20	20	125	30	20	25	16	0.8	DN**1104...	3
ADJNR/L2525M1104-A	25	25	150	30	25	32	19	0.8	DN**1104...	3
ADJNR/L2020K15-A	20	20	125	36	20	25	17	0.8	DN**1504...	3
ADJNR/L2020K1506-A	20	20	125	36	20	25	17	0.8	DN**1506...	3
ADJNR/L2525M15-A	25	25	150	36	25	32	18	0.8	DN**1504...	3
ADJNR/L2525M1506-A	25	25	150	36	25	32	18	0.8	DN**1506...	3
ADJNR/L3225P15-A	32	25	170	36	32	32	18	0.8	DN**1504...	3

*Torque: Recommended torque (lbf·ft, N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS



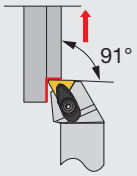




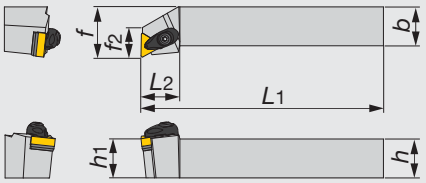
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
ADJNR/L**3-A,1104A	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASD322	CSTB-3.5	T-15F
ADJNR/L**4-A, 15-A	ACP4S	ACS-5W	BP-7	SP-2.5	ASD432	CSTB-3.5	T-15F
ADJNR/L**1506-A	ACP4S	ACS-5W	BP-7	SP-2.5	ASD423	CSTB-3.5	T-15F

ATFNR/L

Double-clamp toolholder for facing with 91° approach angle, negative triangle inserts



Cutting edge style **F**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
ATFNR/L123-A	0.750	0.750	4.500	1.000	0.750	1.000	0.718	0.032	TN**33...	2.2
ATFNR/L163-A	1.000	1.000	6.000	1.000	1.000	1.250	0.750	0.032	TN**33...	2.2

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
ATFNR/L2020K16-A	20	20	125	25	20	25	18	0.8	TN**1604...	3
ATFNR/L2525M16-A	25	25	150	25	25	32	19	0.8	TN**1604...	3

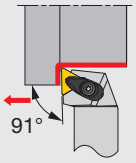
*Torque: Recommended torque (lbf·ft, N·m) for clamping
**r_ε: Standard corner radius

SPARE PARTS

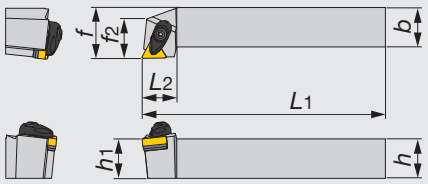
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
ATFNR/L**3-A, 16-A	ACP3S	ACS-5W	BP-7	SP-2.5	AST322	CSTB-3.5	T-15F

ATGNR/L

Double-clamp toolholder with 91° approach angle, for negative triangle inserts



Cutting edge style **G**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
ATGNR/L123-A	0.750	0.750	4.500	0.875	0.750	1.000	0.875	0.031	TN**33...	2.2
ATGNR/L163-A	1.000	1.000	6.000	0.875	1.000	1.250	1.000	0.031	TN**33...	2.2

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
ATGNR/L2020K16-A	20	20	125	22	20	25	22	0.8	TN**1604...	3
ATGNR/L2525M16-A	25	25	150	22	25	32	25	0.8	TN**1604...	3

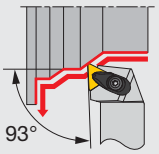
*Torque: Recommended torque (lbf·ft, N·m) for clamping
**r_ε: Standard corner radius

SPARE PARTS

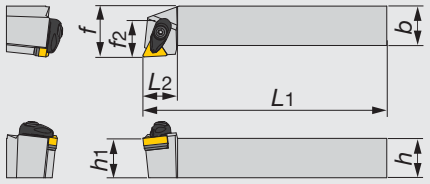
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
ATGNR/L**3-A, 16-A	ACP3S	ACS-5W	BP-7	SP-2.5	AST322	CSTB-3.5	T-15F

ATJNR/L

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



Cutting edge style **J**



Right hand (R) shown.

Inch	h	b	L_1	L_2	h_1	f	f_2	r_ε**	Insert	Torque*
ATJNR/L123-A	0.750	0.750	4.500	0.875	0.750	1.000	0.875	0.031	TN**33...	2.2
ATJNR/L163-A	1.000	1.000	6.000	0.875	1.000	1.250	1.000	0.031	TN**33...	2.2

Metric	h	b	L_1	L_2	h_1	f	f_2	r_ε**	Insert	Torque*
ATJNR/L2020K16-A	20	20	125	22	20	25	23	0.8	TN**1604...	3
ATJNR/L2525M16-A	25	25	150	22	25	32	25	0.8	TN**1604...	3

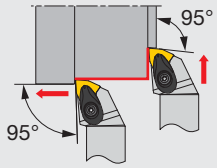
*Torque: Recommended torque (lbf·ft, N·m) for clamping
**r_ε: Standard corner radius

SPARE PARTS

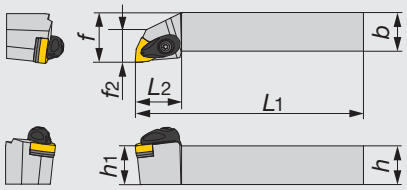
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
ATJNR/L**3-A, 16-A	ACP3S	ACS-5W	BP-7	SP-2.5	AST322	CSTB-3.5	T-15F

AWLNR/L

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



Cutting edge style **L**



Right hand (R) shown.

Inch	h	b	L_1	L_2	h_1	f	f_2	r_ε**	Insert	Torque*
AWLNR/L1233-A	0.750	0.750	4.500	1.125	0.750	1.000	0.625	0.031	WN**33...	2.2
AWLNR/L1633-A	1.000	1.000	6.000	1.125	1.000	1.250	0.875	0.031	WN**33...	2.2
AWLNR/L124-A	0.750	0.750	4.500	1.250	0.750	1.000	0.764	0.031	WN**43...	2.2
AWLNR/L164-A	1.000	1.000	6.000	1.250	1.000	1.250	0.875	0.031	WN**43...	2.2
AWLNR/L204-A	1.250	1.250	7.000	1.250	1.250	1.500	1.000	0.031	WN**43...	2.2

Metric	h	b	L_1	L_2	h_1	f	f_2	r_ε**	Insert	Torque*
AWLNR/L2020K0604-A	20	20	125	27	20	25	16	0.8	WN**0604...	3
AWLNR/L2525M0604-A	25	25	150	27	25	32	23	0.8	WN**0604...	3
AWLNR/L2020K08-A	20	20	125	30	20	25	19	0.8	WN**0804...	3
AWLNR/L2525M08-A	25	25	150	30	25	32	21	0.8	WN**0804...	3
AWLNR/L2525M08-A	25	25	150	30	25	32	21	0.8	WN**0804...	3

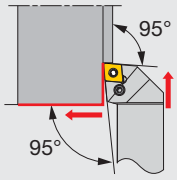
*Torque: Recommended torque (lbf·ft, N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS

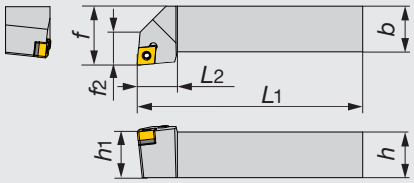
Designation	Clamp	Clamping screw	Spring	Spring pin	Shim	Shim screw	Wrench
AWLNR/L**3A,0604-A	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASW322	CSTB-3.5	T-15F
AWLNR/L**4A,08-A	ACP4S	ACS-5W	BP-7	SP-2.5	ASW422	CSTB-3.5	T-15F

PCLNR/L

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



Cutting edge style **L**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PCLNR/L1233	0.750	0.750	4.500	0.813	0.750	1.000	0.625	0.031	CN**33...	1.5
PCLNR/L1633	1.000	1.000	6.000	0.813	1.000	1.250	0.750	0.031	CN**33...	1.5

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PCLNR/L2020K0904	20	20	125	20	20	25	15	0.8	CN**0904...	2
PCLNR/L2525M0904	25	25	150	25	25	32	18	0.8	CN**0904...	2
PCLNR/L1616	16	16	100	26	16	20	–	0.8	CN**1204...	3
PCLNR/L2020	20	20	125	28	20	25	18	0.8	CN**1204...	3
PCLNR/L2525M4	25	25	150	28	25	32	18	0.8	CN**1204...	3
PCLNR/L3225P4	32	25	170	28	32	32	18	0.8	CN**1204...	3

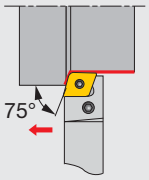
*Torque: Recommended torque (lbf·ft, N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS

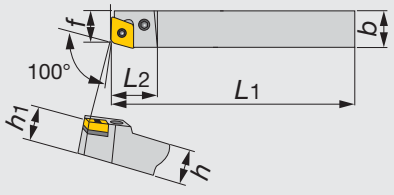
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PCLNR/L**33,0904	LSC317	LCS3	P-2.5	LSP3	LCL33
PCLNR/L1616	LSC42	LCS4CA	P-3	LSP4	LCL4
PCLNR/L2020	LSC42	LCS4	P-3	LSP4	LCL4
PCLNR/L2525M4	LSC42	LCS4	P-3	LSP4	LCL4
PCLNR/L3225P4	LSC42	LCS4	P-3	LSP4	LCL4

PCBNR/L

Lever lock type toolholder with 75° approach angle, for negative 80° rhombic inserts



Cutting edge style **B**



Right hand (R) shown.

Metric	*h*	*b*	L_1	L_2	h_1	*f*	r_ε**	Insert
PCBNR/L2525	25	25	150	28	25	22	0.8	CN**1204...

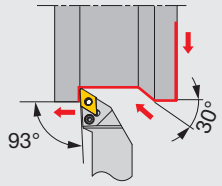
Note: 100°corners are used
**r_ε: Standard corner radius

SPARE PARTS

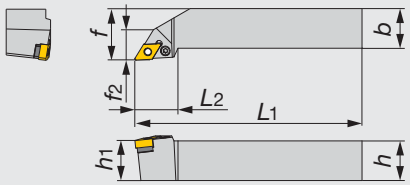
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PCBNR/L2525	LSC42	LCS4	P-3	LSP4	LCL4

PDJNR/L

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



Cutting edge style **J**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PDJNR/L1033	0.625	0.625	4.000	1.125	0.625	0.875	0.625	0.031	DN**33...	1.5
PDJNR/L1233	0.750	0.750	4.500	1.125	0.750	1.000	0.625	0.031	DN**33...	1.5
PDJNR/L1633	1.000	1.000	6.000	1.125	1.000	1.250	0.750	0.031	DN**33...	1.5

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PDJNR/L1616H1104	16	16	100	27	16	20	16	0.8	DN**1104...	2
PDJNR/L2020K1104	20	20	125	27	20	25	16	0.8	DN**1104...	2
PDJNR/L2525M1104	25	25	150	27	25	32	19	0.8	DN**1104...	2
PDJNR/L2020	20	20	125	34	20	25	19	0.8	DN**1504...	3
PDJNR2020K15E	20	20	125	36	20	25	-	0.8	DN**1506...	3
PDJNR/L2520	25	20	150	34	25	25	19	0.8	DN**1504...	3
PDJNR/L2525	25	25	150	34	25	32	19	0.8	DN**1504...	3
PDJNR/L2525M15E	25	25	150	36	25	32	-	0.8	DN**1506...	3
PDJNR/L3225	32	25	170	32	32	32	19	0.8	DN**1504...	3
PDJNR3225P15E	32	25	170	36	32	34	-	0.8	DN**1506...	3

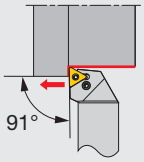
*Torque: Recommended torque (lbf·ft, N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS

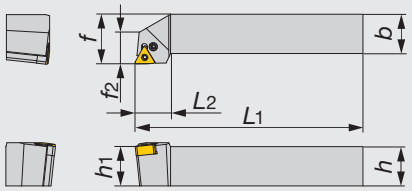
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PDJNR/L**33,1104	ELSD32	LCS3	P-2.5	LSP3	LCL33L
PDJNR/L2020	LSD42	LCS4	P-3	LSP4	LCL4
PDJNR2020K15E	ELSD42	ELCS4	P-3	LSP4S	LCL44
PDJNR/L2520	LSD42	LCS4	P-3	LSP4	LCL4
PDJNR/L2525	LSD42	LCS4	P-3	LSP4	LCL4
PDJNR/L2525M15E	ELSD42	ELCS4	P-3	LSP4S	LCL44
PDJNR/L3225	LSD42	LCS4	P-3	LSP4	LCL4
PDJNR3225P15E	ELSD42	ELCS4	P-3	LSP4S	LCL44

PTGNR/L

Lever lock type toolholder with 91° approach angle, for negative triangle inserts



Cutting edge style **G**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PTGNR/L1223	0.750	0.750	4.500	0.750	0.750	1.000	0.625	0.031	TN**23...	1.5
PTGNR/L1623	1.000	1.000	6.000	0.750	1.000	1.250	0.875	0.031	TN**23...	1.5

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PTGNR/L2020K1104	20	20	125	20	20	25	15	0.8	TN**1104...	2
PTGNR/L2525M1104	25	25	150	20	25	32	22.5	0.8	TN**1104...	2
PTGNR/L1616	16	16	100	22	16	20	16	0.8	TN**1604...	2
PTGNR/L2020	20	20	125	22	20	25	16	0.8	TN**1604...	2
PTGNR/L2525M3	25	25	150	22	25	32	21	0.8	TN**1604...	2

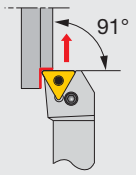
*Torque: Recommended torque (lbf·ft, N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS

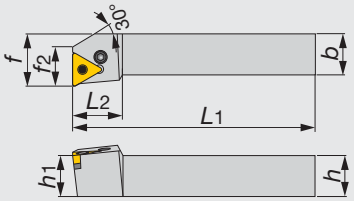
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PTGNR/L**23,1104	-	LCS23A	P-2.5	-	LCL23
PTGNR/L1616, 2020	LST317	LCS3	P-2.5	LSP3	LCL3
PTGNR/L2525M3	LST317	LCS3	P-2.5	LSP3	LCL3

PTFNR/L

Lever lock type toolholder for facing with 91° approach angle, negative triangle inserts



Cutting edge style **F**



Right hand (R) shown.

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PTFNR/L2020K1104	20	20	125	16	20	25	16	0.8	TN**1104...	2
PTFNR/L2525M1104	25	25	150	22	25	32	20	0.8	TN**1104...	2
PTFNR/L1616	16	16	100	22	16	20	16	0.8	TN**1604...	2
PTFNR/L2020	20	20	125	22	20	25	16	0.8	TN**1604...	2
PTFNR/L2525M3	25	25	150	22	25	32	20	0.8	TN**1604...	2

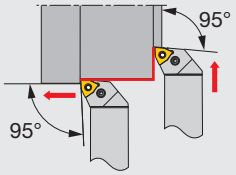
**r_ε: Standard corner radius

SPARE PARTS

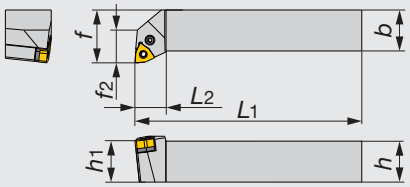
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PTFNR/L**1104	-	LCS23A	P-2.5	-	LCL23
PTFNR/L1616, 2020	LST317	LCS3	P-2.5	LSP3	LCL3
PTFNR/L2525M3	LST317	LCS3	P-2.5	LSP3	LCL3

PWLNR/L-Eco

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



Cutting edge style **L**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PWLNR/L1233	0.750	0.750	4.500	0.625	0.750	1.000	0.688	0.031	WN**33...	1.5
PWLNR/L1633	1.000	1.000	6.000	0.719	1.000	1.250	0.750	0.031	WN**33...	1.5

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PWLNR/L2020K0604	20	20	125	15	20	25	18	0.8	WN**0604...	2
PWLNR/L2525M0604	25	25	150	19	25	32	20	0.8	WN**0604...	2

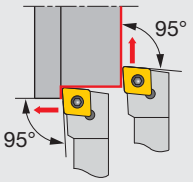
*Torque: Recommended torque (lbf·ft, N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS

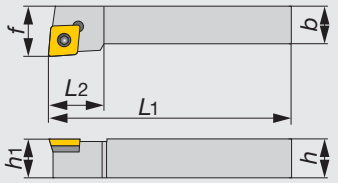
Designation	Shim	Clamping screw	Wrench	Spring pin	Lever
PWLNR/L....	LSW312	LCS3	P-2.5	LSP3	LCL3

SCLCR/L

Screw-on clamp toolholder with 95° approach angle, for positive 80° rhombic inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	r_ε**	Insert
SCLCR/L 103	0.625	0.625	4.000	0.625	0.625	0.750	0.031	CC**32.5...
SCLCR/L 123	0.750	0.750	4.500	0.625	0.750	0.750	0.031	CC**32.5...
SCLCR/L 163	1.000	1.000	6.000	0.625	1.000	0.750	0.031	CC**32.5...

Metric	*h*	*b*	L_1	L_2	h_1	*f*	r_ε**	Insert
SCLCR/L1616H09	16	16	100	16	16	20	0.8	CC**09T3...

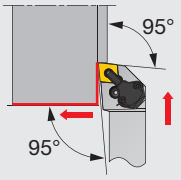
**r_ε: Standard corner radius

SPARE PARTS

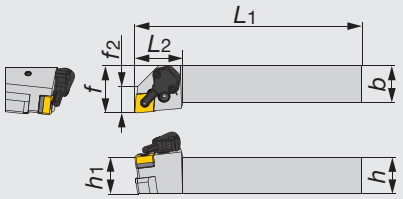
Designation	Clamping screw	Shim screw	Shim	Wrench 1	Wrench 2
SCLCR/L103, 123, 163 SCLCR/L1616H09	CSTB-3.5L	DTS5-3.5	SSC32	P-3.5	T-15F

PCLNR/L-CHP

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



Cutting edge style **L**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PCLNR/L1233-CHP	0.750	0.750	4.500	1.300	0.750	1.250	0.750	0.031	CN**33...	1.5
PCLNR/L124-CHP	0.750	0.750	4.500	1.300	0.750	1.250	0.750	0.031	CN**43...	2.2
PCLNR/L1633-CHP	1.000	1.000	6.000	1.300	1.000	1.250	0.750	0.031	CN**33...	1.5
PCLNR/L164-CHP	1.000	1.000	6.000	1.300	1.000	1.250	0.750	0.031	CN**43...	2.2

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PCLNR/L2020K0904-CHP	20	20	125	33	20	32	18	0.8	CN**0904...	2
PCLNR/L2525M0904-CHP	25	25	150	33	25	32	18	0.8	CN**0904...	2
PCLNR/L2020K12-CHP	20	20	125	33	20	32	18	0.8	CN**1204...	3
PCLNR/L2525M12-CHP	25	25	150	33	25	32	18	0.8	CN**1204...	3

*Torque: Recommended torque (lbf·ft, N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS

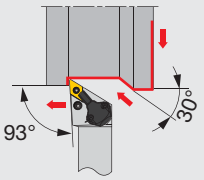
Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PCLNR/L**0904-CHP, PCLNR/L**33-CHP	LSC317	LCS3	P-2.5	LSP3	LCL33
PCLNR/L**12-CHP, PCLNR/L**4-CHP	LSC42	LCS4	P-3	LSP4	LCL4

SPARE PARTS

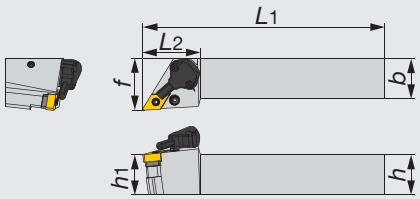
Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PCLNR/L**0904-CHP, PCLNR/L**33-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2
PCLNR/L**12-CHP, PCLNR/L**4-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

PDJNR/L-CHP

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



Cutting edge style **J**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	r_ε**	Insert	Torque*
PDJNR/L1233-CHP	0.750	0.750	4.500	1.420	0.750	1.250	0.031	DN**33...	1.5
PDJNR/L124-CHP	0.750	0.750	4.500	1.420	0.750	1.250	0.031	DN**43...	2.2
PDJNR/L1633-CHP	1.000	1.000	6.000	1.420	1.000	1.250	0.031	DN**33...	1.5
PDJNR/L164-CHP	1.000	1.000	6.000	1.420	1.000	1.250	0.031	DN**43...	2.2

Metric	*h*	*b*	L_1	L_2	h_1	*f*	r_ε**	Insert	Torque*
PDJNR/L2020K1104-CHP	20	20	125	36	20	32	0.8	DN**1104...	2
PDJNR/L2020K15-CHP	20	20	125	36	20	32	0.8	DN**1504...	3
PDJNR/L2525M1104-CHP	25	25	150	36	25	32	0.8	DN**1104...	2
PDJNR/L2525M15-CHP	25	25	150	36	25	32	0.8	DN**1504...	3

*Torque: Recommended torque (lbf·ft, N·m) for clamping
**r_ε: Standard corner radius

SPARE PARTS

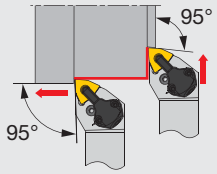
Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PDJNR/L**1104-CHP, PDJNR/L**33-CHP	ELSD32	LCS3	P-2.5	LSP3	LCL33L
PDJNR/L**15-CHP, PDJNR/L**4-CHP	LSD43A	LCS4	P-3	LSP4	LCL4

SPARE PARTS

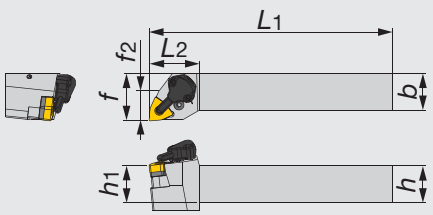
Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PDJNR/L**1104-CHP, PDJNR/L**33-CHP	CU-D-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2
PDJNR/L**15-CHP, PDJNR/L**4-CHP	CU-D-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

PWLNR/L-CHP

Lever lock type toolholders with 95° approach angle. For negative 80° trigon insert. High-pressure coolant capability.



Cutting edge style **L**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PWLNR/L1233-CHP	0.750	0.750	4.500	1.969	0.750	1.250	0.781	0.031	WN**33...	1.5
PWLNR/L124-CHP	0.750	0.750	4.500	1.969	0.750	1.250	0.781	0.031	WN**43...	1.5
PWLNR/L1633-CHP	1.000	1.000	6.000	1.969	1.000	1.250	0.781	0.031	WN**33...	1.5
PWLNR/L164-CHP	1.000	1.000	6.000	1.969	1.000	1.250	0.781	0.031	WN**43...	1.5

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PWLNR/L2020K0604-CHP	20	20	125	34	20	32	20	0.8	WN**0604...	2
PWLNR/L2020K08-CHP	20	20	125	34	20	32	20	0.8	WN**0804...	3
PWLNR/L2525M0604-CHP	25	25	150	34	25	32	20	0.8	WN**0604...	2
PWLNR/L2525M08-CHP	25	25	150	34	25	32	20	0.8	WN**0804...	3

*Torque: Recommended torque (lbf·ft, N·m) for clamping
**r_ε: Standard corner radius

SPARE PARTS





Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PWLNR/L**0604-CHP, PWLNR/L**33-CHP	LSW312	LCS3	P-2.5	LSP3	LCL3
PWLNR/L**08-CHP, PWLNR/L**4-CHP	LSW42	LCS4	P-2.5	LSP4	LCL4

SPARE PARTS

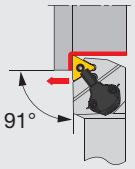




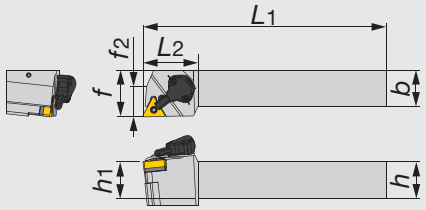

Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PWLNR/L**0604-CHP, PWLNR/L**33-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2
PWLNR/L**08-CHP, PWLNR/L**4-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

PTGNR/L-CHP

Lever lock type toolholders with 91° approach angle. For negative triangle insert. High-pressure coolant capability.



Cutting edge style **G**



Right hand (R) shown.

Inch	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PTGNR/L1223-CHP	0.750	0.750	4.500	1.500	0.750	1.250	0.813	0.031	TN**23...	1.5
PTGNR/L123-CHP	0.750	0.750	4.500	1.500	0.750	1.250	0.813	0.031	TN**33...	1.5
PTGNR/L1623-CHP	1.000	1.000	6.000	1.500	1.000	1.250	0.813	0.031	TN**23...	1.5
PTGNR/L163-CHP	1.000	1.000	6.000	1.500	1.000	1.250	0.813	0.031	TN**33...	1.5

Metric	*h*	*b*	L_1	L_2	h_1	*f*	f_2	r_ε**	Insert	Torque*
PTGNR/L2020K1104-CHP	20	20	125	38	20	32	21	0.8	TN**1104...	2
PTGNR/L2020K16-CHP	20	20	125	38	20	32	21	0.8	TN**1604...	2
PTGNR/L2525M1104-CHP	25	25	150	38	25	32	21	0.8	TN**1104...	2
PTGNR/L2525M16-CHP	25	25	150	38	25	32	21	0.8	TN**1604...	2

*Torque: Recommended torque (lbf·ft, N·m) for clamping
**r_ε: Standard corner radius

SPARE PARTS

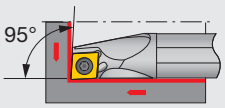
Designation	Shim	Clamping screw	Wrench 1	Spring pin	Lever
PTGNR/L**1104-CHP, PTGNR/L**23-CHP	-	LCS23A	P-2.5	LSP3	LCL23
PTGNR/L**15-CHP PTGNR/L**3-CHP	LST317	LCS3	P-2.5	LSP3	LCL3

SPARE PARTS

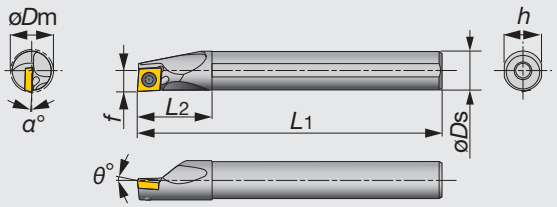
Designation	Coolant unit	Mounting screw	Wrench 2	O-ring	Coolant screw	Wrench 3
PTGNR/L**1104-CHP, PTGNR/L**23-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2
PTGNR/L**15-CHP PTGNR/L**3-CHP	CU-CW-CHP	SRM3	T-8F	OR6.4X0.9N	SRM4X4TL360	P-2

A/E-SCLPR/L

Screw-on boring bars, for positive 80° rhombic inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	Material	øDm	øDs	f	L1	L2	h	θ°	α°	rε**	Insert	Torque*
A06-SCLPR/L2-D08	STEEL	0.500	0.375	0.281	5.000	0.750	0.350	5	-5	0.016	CP**21.5...	0.9
A08-SCLPR/L2-D11	STEEL	0.687	0.500	0.406	5.000	1.000	0.475	5	-2	0.016	CP**21.5...	0.9
A10-SCLPR/L3-D14	STEEL	0.875	0.625	0.531	7.000	1.250	0.600	5	-2	0.016	CP**32.5...	2.2
E06-SCLPR/L2-D08	CARBIDE	0.500	0.375	0.281	5.000	0.750	0.350	0	-9	0.016	CP**21.5...	0.9
E08-SCLPR/L2-D11	CARBIDE	0.688	0.500	0.406	5.000	1.000	0.475	0	-6	0.016	CP**21.5...	0.9
E10-SCLPR/L3-D14	CARBIDE	0.875	0.625	0.531	7.000	1.250	0.600	0	-7	0.032	CP**32.5...	2.2

*Torque: Recommended torque (Nm) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLCL** type), and the left hand insert (L) is used for the right hand toolholders (SCLCR** type).

SPARE PARTS


Designation	Clamping screw	Wrench
A06-SCLPR/L2-D08	CSTB-2.5L042	T-8F
A08-SCLPR/L2-D11	CSTB-2.5S	T-8F
A10-SCLPR/L3-D14	CSTB-4L070	T-15F
E06-SCLPR/L2-D08	CSTB-2.5S	T-8F
E08-SCLPR/L2-D11	CSTB-2.5B	T-8F
E10-SCLPR/L3-D14	CSTB-4S	T-15F

Metric	Material	øDm	øDs	f	L1	L2	h	θ°	α°	rε**	Insert	Torque*
A08H-SCLPR/L06-D100	STEEL	10	8	5.5	100	16	7.5	5	-8	0.4	CP**0602...	1.2
A10K-SCLPR/L06-D120	STEEL	12	10	6	125	20	9	5	-5	0.4	CP**0602...	1.2
A10K-SCLPR/L08-D120	STEEL	12	10	6	125	20	9	5	-5	0.4	CP**0802...	1.4
A12M-SCLPR/L06-D140	STEEL	14	12	7	150	24	11	5	-4	0.4	CP**0602...	1.2
A12M-SCLPR/L08-D140	STEEL	14	12	7	150	24	11	5	-4	0.4	CP**0802...	1.4
A12M-SCLPR/L08-D160	STEEL	16	12	9	150	24	11	5	-3	0.4	CP**0802...	1.4
A16Q-SCLPR/L09-D180	STEEL	18	16	9	180	32	15	5	-3.5	0.8	CP**0903...	3
A16Q-SCLPR/L09-D200	STEEL	20	16	11	180	32	15	5	-3	0.8	CP**0903...	3
A20R-SCLPR/L09-D220	STEEL	22	20	11	200	36	18	5	-2	0.8	CP**0903...	3
A25S-SCLPR/L09-D270	STEEL	27	25	13.5	250	45	23	5	-1	0.8	CP**0903...	3
E08K-SCLPR/L06-D100	CARBIDE	10	8	5.5	125	22	7.5	5	-8	0.4	CP**0602...	1.2
E10M-SCLPR/L06-D120	CARBIDE	12	10	6	150	25	9	5	-5	0.4	CP**0602...	1.2
E10H-SCLPR08-D120	CARBIDE	12	10	6	100	25	9	5	-5	0.4	CP**0802...	1.4
E10M-SCLPR/L08-D120	CARBIDE	12	10	6	150	25	9	5	-5	0.4	CP**0802...	1.4
E12Q-SCLPR/L06-D140	CARBIDE	14	12	7	180	27	11	5	-4	0.4	CP**0602...	1.2
E12G-SCLPR08-D140	CARBIDE	14	12	7	90	27	11	5	-4	0.4	CP**0802...	1.4
E12J-SCLPR08-D140	CARBIDE	14	12	7	110	27	11	5	-4	0.4	CP**0802...	1.4
E12Q-SCLPR/L08-D140	CARBIDE	14	12	7	180	27	11	5	-4	0.4	CP**0802...	1.4
E12G-SCLPR08-D160	CARBIDE	16	12	9	90	27	11	5	-3	0.4	CP**0802...	1.4
E12J-SCLPR08-D160	CARBIDE	16	12	9	110	27	11	5	-3	0.4	CP**0802...	1.4
E12Q-SCLPR/L08-D160	CARBIDE	16	12	9	180	27	11	5	-3	0.4	CP**0802...	1.4
E16H-SCLPR09-D180	CARBIDE	18	16	9	100	32	15	5	-3.5	0.8	CP**0903...	3
E16L-SCLPR09-D180	CARBIDE	18	16	9	130	32	15	5	-3.5	0.8	CP**0903...	3
E16R-SCLPL09-D180	CARBIDE	18	16	9	200	32	15	5	-3.5	0.8	CP**0903...	3
E16H-SCLPR09-D200	CARBIDE	20	16	11	100	32	15	5	-3	0.8	CP**0903...	3
E16L-SCLPR09-D200	CARBIDE	20	16	11	130	32	15	5	-3	0.8	CP**0903...	3
E16R-SCLPL09-D200	CARBIDE	20	16	11	200	32	15	5	-3	0.8	CP**0903...	3

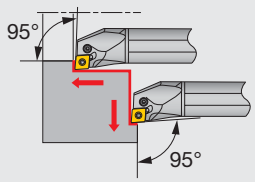
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLPL** type), and the left hand insert (L) is used for the right hand toolholders (SCLPR** type).

SPARE PARTS

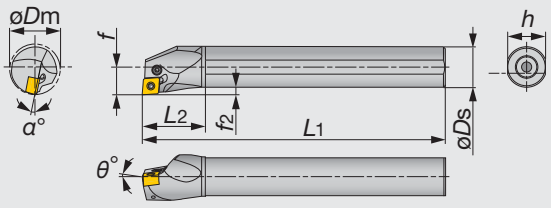

Designation	Clamping screw	Wrench
A**-SCLPR/L06-D...	CSTB-2.5S	T-8F
A10K-SCLPR/L08-D120	CSTB-3L042	T-9F
A12M-SCLPR/L08-D...	CSTB-3L050	T-9F
A**-SCLPR/L09-D...	CSTB-4L060	T-15F
E**-SCLPR/L06-D...	CSTB-2.5S	T-8F
E10*-SCLPR/L08-D...	CSTB-3L042	T-9F
E12*-SCLPR/L08-D...	CSTB-3L050	T-9F
E16*-SCLPR/L09-D...	CSTB-4L060	T-15F

A-PCLNR/L

Lever clamp boring bars, for negative 80° rhombic inserts



Cutting edge style **L**



Right hand (R) shown.

Metric	Material	$øD_m$	$øD_s$	f	L_1	L_2	h	f_2	$\theta°$	$\alpha°$	r_{ε}**	Insert	Torque*
A16M-PCLNR/L0904-D200	STEEL	20	16	11	150	32	15	3	-6	-16	0.8	CN**0904...	1.7
A20Q-PCLNR/L0904-D250	STEEL	25	20	13	180	36	18	3	-6	-12	0.8	CN**0904...	1.7
A25R-PCLNR/L12-D320	STEEL	32	25	17	200	45	23	4.5	-6	-13	0.8	CN**1204...	2.7
A32S-PCLNR/L12-D400	STEEL	40	32	22	250	50	30	6	-6	-11	0.8	CN**1204...	4.8
A40T-PCLNR/L12-D500	STEEL	50	40	27	300	60	37	7	-6	-10	0.8	CN**1204...	4.8
A50U-PCLNR/L12-D630	STEEL	63	50	35	350	65	47	10	-6	-8	0.8	CN**1204...	4.8

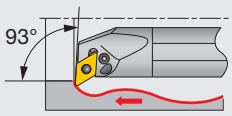
*Torque: Recommended torque (N·m) for clamping **r_{ε}: Standard corner radius

SPARE PARTS

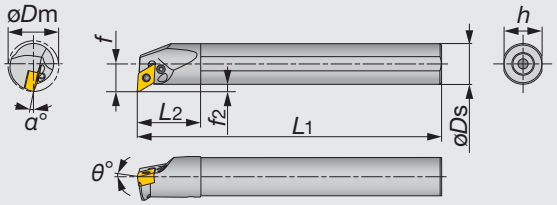
Designation	Shim	Clamping screw 1	Clamping screw 2	Wrench 1	Wrench 2	Spring	Lever	Oil supply attachment (Optional parts)	Screw for oil hole (Optional parts)
A16M-PCLNR/L0904-D200	-	-	LCS33	P-2F	-	-	LCL33N	-	(SSHM3-4)
A20Q-PCLNR/L0904-D250	-	-	LCS33	P-2F	-	-	LCL33N	(EA20)	(SSHM3-4)
A25R-PCLNR/L12-D320	-	LCS43	-	-	P-2.5	-	LCL43N	(EA-32)	(SSHM5-6)
A32S-PCLNL12-D400	LSC42BL	-	LCS4	-	P-3	LSP4	LCL4	-	(SSHM6-6)
A40T-PCLNR12-D500	LSC42BR	-	LCS4	-	P-3	LSP4	LCL4	-	(SSHM6-6)
A50U-PCLNR12-D630	LSC42BR	-	LCS4	-	P-3	LSP4	LCL4	-	(SSHM6-6)

A-PDUNR/L

Lever clamp boring bars, for negative 55° rhombic inserts



Cutting edge style **U**



Right hand (R) shown.

Metric	Material	$øD_m$	$øD_s$	f	L_1	L_2	h	f_2	$\theta°$	$\alpha°$	r_{ε}**	Insert	Torque*
A20Q-PDUNR/L1104-D250	STEEL	25	20	13	180	36	18	3	-6	-14	0.8	DN**1104...	1.7
A32S-PDUNR/L15-D400	STEEL	40	32	22	250	50	30	6	-6	-13	0.8	DN**1504...	4.8
A40T-PDUNR/L15-D500	STEEL	50	40	27	300	60	37	7	-6	-10	0.8	DN**1504...	4.8
A50U-PDUNR/L15-D630	STEEL	63	50	35	350	65	47	10	-6	-8	0.8	DN**1504...	4.8
A32S-PDUNR/L1506-D400	STEEL	40	32	22	250	50	30	6	-6	-13	0.8	DN**1506...	4.8
A40T-PDUNR/L1506-D500	STEEL	50	40	27	300	60	37	7	-6	-11	0.8	DN**1506...	4.8
A50U-PDUNR/L1506-D630	STEEL	63	50	35	350	65	47	10	-6	-10	0.8	DN**1506...	4.8

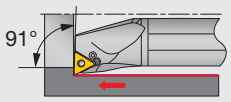
*Torque: Recommended torque (N·m) for clamping **r_{ε}: Standard corner radius
When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PDUNL ** type), and the left hand insert (L) is used for the right hand toolholders (PDUNR ** type).

SPARE PARTS

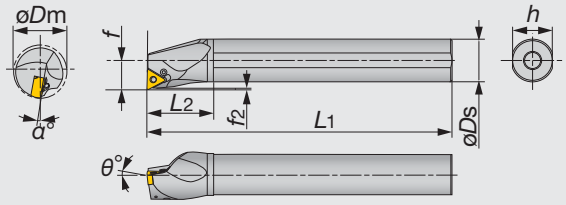
Designation	Shim	Clamping screw 1	Clamping screw 2	Wrench 1	Wrench 2	Spring	Lever	Oil supply attachment (Optional parts)	Screw for oil hole (Optional parts)
A20Q-PDUNR/L1104-D250	-	LCS22A	-	P-2F	-	-	LCL33NL	(EA-20)	(SSHM2.5-3)
A32S-PDUNR/L15-D400	LSD42BR/L	-	LCS4	-	P-3	LSP4	LCL4	(EA-32)	(SSHM5-6)
A40T-PDUNR/L15-D500	LSD42BR/L	-	LCS4	-	P-3	LSP4	LCL4	-	(SSHM6-6)
A50U-PDUNR/L15-D630	LSD42BR/L	-	LCS4	-	P-3	LSP4	LCL4	-	(SSHM6-6)
A32S-PDUNR/L1506-D400	ELSD42	-	ELCS4	-	P-3	LSP4S	LCL44	(EA-20)	(SSHM5-6)
A40T-PDUNR/L1506-D500	ELSD42	-	ELCS4	-	P-3	LSP4S	LCL44	-	(SSHM6-6)
A50U-PDUNR/L1506-D630	ELSD42	-	ELCS4	-	P-3	LSP4S	LCL44	-	(SSHM6-6)

A-PTFNR/L

Lever clamp boring bars, for negative triangle inserts



Cutting edge style **F**



Right hand (R) shown.

Metric	Material	$øD_m$	$øD_s$	f	L_1	L_2	h	f_2	$\theta°$	$\alpha°$	r_{ε}**	Insert	Torque*
A25R-PTFNR/L1104-D320	STEEL	32	25	17	200	45	23	1.31	-6	-12	0.8	TN**1104...	2
A32S-PTFNR/L1104-D400	STEEL	40	32	22	250	50	30	1.25	-6	-10	0.8	TN**1104...	2
A25R-PTFNR/L16-D320	STEEL	32	25	17	200	45	23	1.2	-6	-12	0.8	TN**1604...	2.7
A32S-PTFNR/L16-D400	STEEL	40	32	22	250	50	30	1.1	-6	-10	0.8	TN**1604...	2.7
A40T-PTFNR/L16-D500	STEEL	50	40	27	300	60	37	1.1	-6	-10	0.8	TN**1604...	2.7
A50U-PTFNR/L16-D630	STEEL	63	50	35	350	65	47	1.1	-6	-8	0.8	TN**1604...	2.7

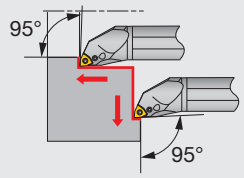
*Torque: Recommended torque (N·m) for clamping **r_{ε}: Standard corner radius

SPARE PARTS

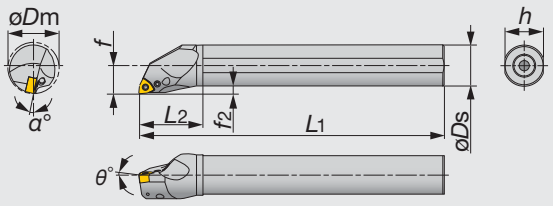
Designation	Shim	Clamping screw1	Clamping screw2	Wrench	Spring pin	Lever	Oil supply attachment (Optional parts)	Screw for oil hole (Optional parts)
A**-PTFNR/L1104-D...	-	LCS23A	-	P-2.5	-	LCL23	-	-
A25R-PTFNR/L16-D320	ELST317BR/L	-	LCS3	P-2.5	LSP3	LCL33	EA-25	SSHM4-5
A32S-PTFNR/L16-D400	LST317BR/L	-	LCS3	P-2.5	LSP3	LCL3	EA-32	SSHM4-5
A40T-PTFNR/L16-D500	LST317BR/L	-	LCS3	P-2.5	LSP3	LCL3	-	SSHM6-6
A50U-PTFNR/L16-D630	LST317BR/L	-	LCS3	P-2.5	LSP3	LCL3	-	SSHM6-6

A-PWLNR/L

Lever clamp boring bars, for negative trigon inserts



Cutting edge style **L**



Right hand (R) shown.

Metric	Material	øDm	øDs	f	L1	L2	h	f2	θ°	α°	rε**	Insert	Torque*
A16M-PWLNR/L0604-D200	STEEL	20	16	11	150	32	15	3	-8	-17	0.8	WN**0604...	1.7
A20Q-PWLNR/L0604-D250	STEEL	25	20	13	180	36	18	3	-6	-14	0.8	WN**0604...	1.7
A25R-PWLNR/L06-D320	STEEL	32	25	17	200	45	23	4.5	-6	-12	0.8	WN**0604...	2.7
A32S-PWLNR/L06-D400	STEEL	40	32	22	250	50	30	6	-6	-11	0.8	WN**0604...	2.7
A40T-PWLNR/L08-D500	STEEL	50	40	27	300	60	37	7	-6	-10	0.8	WN**0804...	4.8

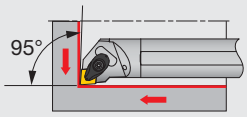
*Torque: Recommended torque (N·m) for clamping **r_ε: Standard corner radius

SPARE PARTS

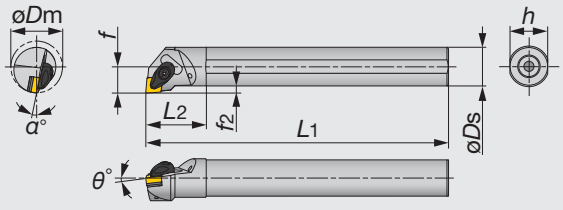
Designation	Shim	Clamping screw 1	Clamping screw 2	Wrench 1	Wrench 2	Spring	Lever	Oil supply attachment (Optional parts)	Screw for oil hole (Optional parts)
A16M-PWLNR/L0604-D200	-	-	LCS33	P-2F	-	-	LCL33N	-	(SSHM3-4)
A20Q-PWLNR/L0604-D250	-	-	LCS33	P-2F	-	-	LCL33N	(EA-20)	(SSHM3-4)
A25R-PWLNR/L06-D320	LSW312BR/L	-	LCS3B	-	P-2.5	LSP3	LCL3	(EA-25)	(SSHM4-5)
A32S-PWLNR/L06-D400	LSW312BR/L	-	LCS3	-	P-2.5	LSP3	LCL3	(EA-32)	(SSHM4-5)
A40T-PWLNR/L08-D500	LSW42BR/L	-	LCS4	-	P-3	LSP4	LCL4	-	(SSHM4-5)

A-ACLNR/L

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



Cutting edge style **L**



Right hand (R) shown.

Inch	Material	øDm	øDs	f	L1	L2	h	f2	θ°	α°	rε**	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...	2.2
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...	2.2
A16-ACLNR/L4-D20	STEEL	1.250	1.000	0.640	12.000	1.750	0.906	0.177	-6	-13	0.031	CN**43...	2.21
A20-ACLNR/L4-D25	STEEL	1.560	1.250	0.770	14.000	1.930	1.180	0.236	-6	-10	0.031	CN**43...	2.21
A24-ACLNR/L4-D32	STEEL	2.000	1.500	0.890	14.000	2.160	1.450	0.275	-6	-8	0.031	CN**43...	2.21
A32-ACLNR/L4-D40	STEEL	2.500	2.000	1.280	16.000	2.550	1.850	0.393	-6	-7	0.031	CN**43...	2.21

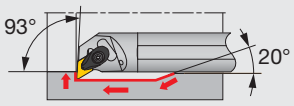
*NOTE: Dimension (h) is the distance between flats on the shank
*Torque: Recommended torque (lb·ft) for clamping
**r_ε: Standard corner radius

SPARE PARTS

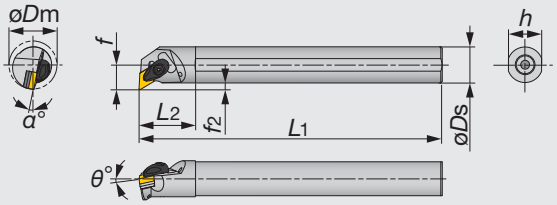
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
A**-ACLNR/L33...	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASC322	CSTB-3.5	T-15F
A**-ACLNR/L4-D...	ACP4S	ACS-5W	BP-7	SP-2.5	ASC422	CSTB-3.5	T-15F

A-ADUNR/L-Eco

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



Cutting edge style **U**



Right hand (R) shown.

Inch	Material	øDm	øDs	f	L1	L2	h	f2	θ°	α°	rε**	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...	2.2
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...	2.2
A16-ADUNR/L4-D20	STEEL	1.250	1.000	0.672	12.000	1.770	0.906	0.177	-6	-13	0.031	DN**43...	2.21
A20-ADUNR/L4-D25	STEEL	1.500	1.250	0.859	14.000	1.960	1.180	0.236	-6	-11	0.031	DN**43...	2.21
A24-ADUNR/L4-D32	STEEL	2.000	1.500	1.063	14.000	2.160	1.450	0.275	-6	-8	0.031	DN**43...	2.21

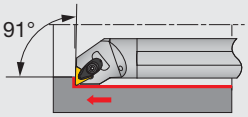
*Torque: Recommended torque (lb·ft) for clamping **r_ε: Standard corner radius

SPARE PARTS

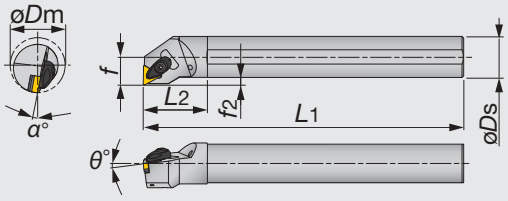
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
A**-ADUNR/L...	ACP3S-E	ACS-5W	BP-7	SP-2.5	ASD322	CSTB-3.5	T-15F
A**-ADUNR/L4-D...	ACP4S	ACS-5W	BP-7	SP-2.5	ASD432	CSTB-3.5	T-15F

A-ATFNR/L

Double-clamp boring bar, for negative triangle inserts



Cutting edge style **F**



Right hand (R) shown.

Inch	Material	øDm	øDs	f	L1	L2	h	f2	θ°	α°	rε**	Insert	Torque*
A16-ATFNR/L3-D20	STEEL	1.250	1.000	0.672	12.000	1.770	0.906	0.177	-6	-13	0.031	TN**33...	2.21
A20-ATFNR/L3-D25	STEEL	1.560	1.250	0.859	14.000	1.960	1.180	0.236	-6	-10	0.031	TN**33...	2.21

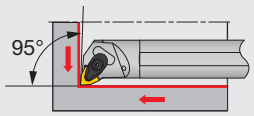
*Torque: Recommended torque (lbf·ft) for clamping
**r_ε: Standard corner radius

SPARE PARTS

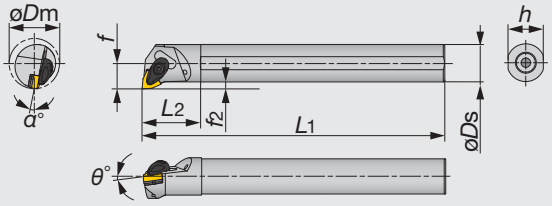
Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
A**-ATFNR/L3-D...	ACP3S	ACS-5W	BP-7	SP-2.5	AST322	CSTB-3.5	T-15F

A-AWLNR/L

Double-clamp boring bars, for negative trigon inserts



Cutting edge style **L**



Right hand (R) shown.

Inch	Material	$øD_m$	$øD_s$	f	L_1	L_2	h	f_2	$\theta°$	$\alpha°$	r_{ε}**	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...	2.2
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...	2.2
A16-AWLNR/L4-D20	STEEL	1.250	1.000	0.672	12.000	1.770	0.906	0.177	-6	-13	0.031	WN**43...	2.21
A20-AWLNR/L4-D25	STEEL	1.560	1.250	0.859	14.000	1.960	1.180	0.236	-6	-10	0.031	WN**43...	2.21
A24-AWLNR/L4-D32	STEEL	2.000	1.500	1.060	14.000	2.160	1.460	0.275	-6	-8	0.031	WN**43...	2.21
A32-AWLNR/L4-D40	STEEL	2.500	2.000	1.370	16.000	2.550	1.850	0.393	-6	-7	0.031	WN**43...	2.21

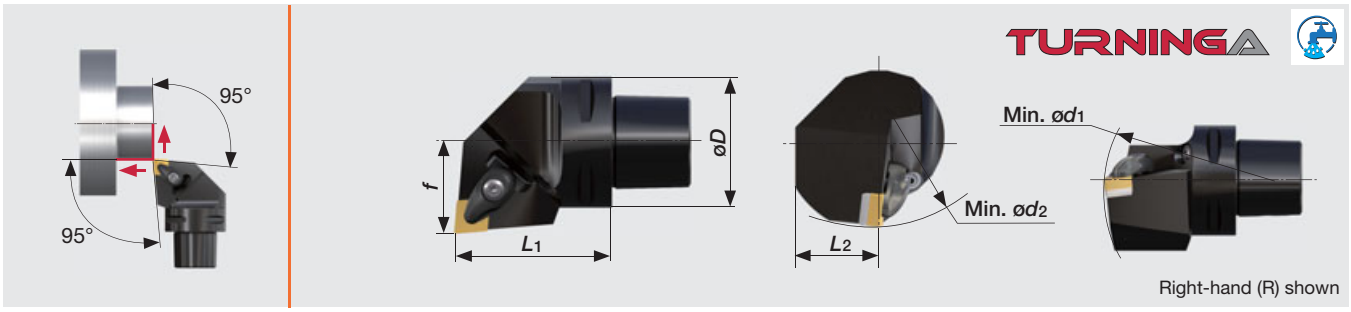
*Torque: Recommended torque (lbf·ft) for clamping
**r_{ε}: Standard corner radius

SPARE PARTS

Designation	Clamp	Clamp screw	Spring	Spring pin	Shim	Shim screw	Wrench
A**-AWLNR/L3-D...	ACP3S	ACS-5W	BP-7	SP-2.5	ASW322	CSTB-3.5	T-15F
A**-AWLNR/L4-D...	ACP4S	ACS-5W	BP-7	SP-2.5	ASW422	CSTB-3.5	T-15F

C-ACLNR/L

TurningA double-clamping toolholder with 95° approach angle, for negative 80° rhombic inserts

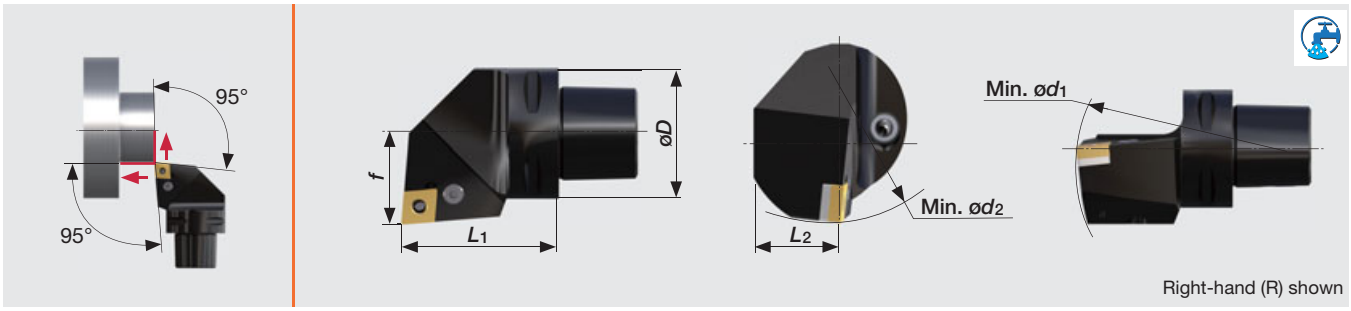


Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	r_ε	Insert
C4ACLNR/L27050-0904N	40	50	25	27	140	110	0.8	CN**0904...
C4ACLNR/L27050-12N	40	50	25	27	140	110	0.8	CN**1204...
C5ACLNR/L35060-12N	50	60	32	35	165	110	0.8	CN**1204...
C6ACLNR/L45065-12N	63	65	41	45	190	125	0.8	CN**1204...
C6ACLNR/L45065-0904N	63	65	35	45	190	110	0.8	CN**0904...

Applicable for 7 MPa pressure coolant

C-PCLNR/L

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



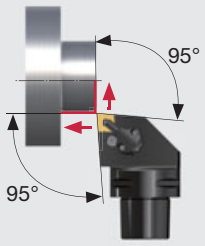
Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	r_ε	Insert
C5PCLNR/L35060-12 (1)	50	60	32	35	-	-	0.8	CN**1204...
C5PCLNR/L35060-12N (2)	50	60	32	35	165	110	0.8	CN**1204...
C6PCLNR/L45065-12N (2)	63	65	41	45	190	125	0.8	CN**1204...

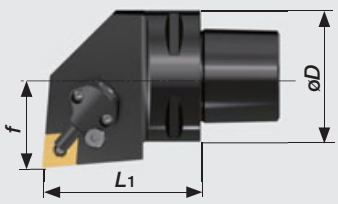
(1) Applicable for 3 MPa pressure coolant (2) Applicable for 7 MPa pressure coolant

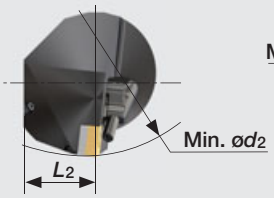
"-" in Min $ød_1$ and $ød_2$: not suitable for internal boring

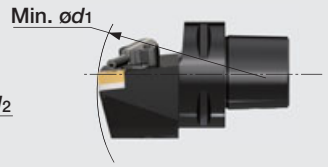
C-PCLNR/L-CHP

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









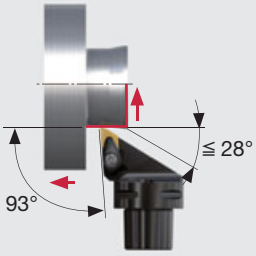
Right-hand (R) shown

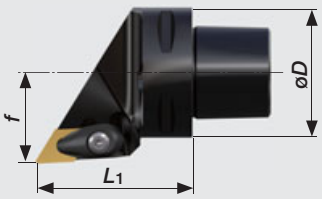
Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	$r_ε$	Insert
C4PCLNR/L27050-0904-CHP	40	50	25	27	140	110	0.8	CN**0904...
C4PCLNR/L27050-12-CHP	40	50	25	27	140	110	0.8	CN**1204...
C5PCLNR/L35060-12-CHP	50	60	30	35	165	110	0.8	CN**1204...
C6PCLNR/L45065-0904-CHP	63	65	35	45	190	110	0.8	CN**0904...
C6PCLNR/L45065-12-CHP	63	65	35	45	190	110	0.8	CN**1204...

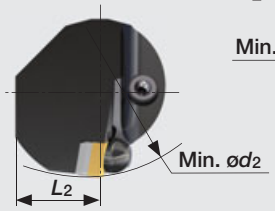
Applicable for 14 MPa pressure coolant

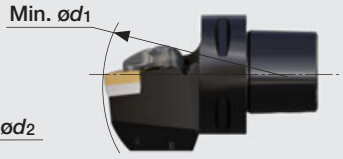
C-ADJNR/L

TurningA double-clamping toolholder with 93° approach angle, for negative 55° rhombic inserts









Right-hand (R) shown

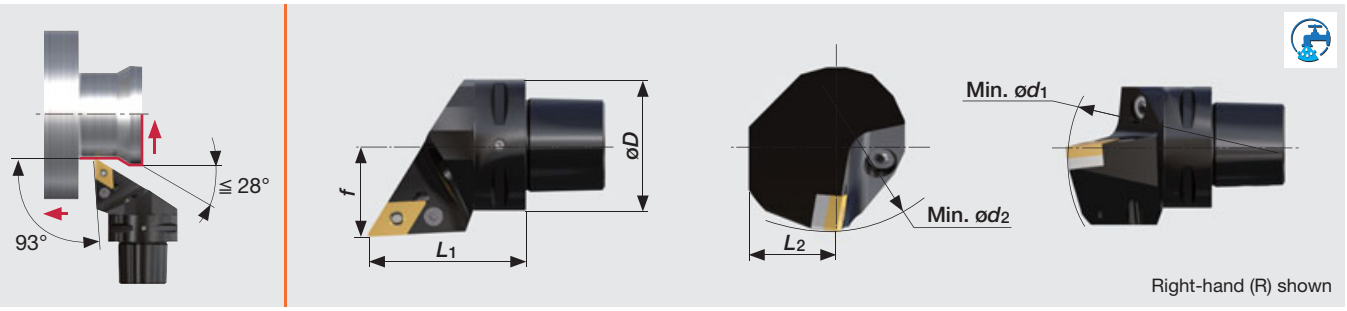
Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	$r_ε$	Insert
C4ADJNR/L27050-1104N (2)	40	50	25	27	145	110	0.8	DN**1104...
C4ADJNR/L27050-15N (2)	40	50	25	27	145	110	0.8	DN**1504...
C5ADJNR/L35060-15N (2)	50	60	32	35	165	110	0.8	DN**1504...
C6ADJNR/L45065-1104N (2)	63	65	35	45	190	110	0.8	DN**1104...
C6ADJNR/L45065-15N (2)	63	65	41	45	190	110	0.8	DN**1504...
C6ADJNR/L45135-15N (2)	63	65	41	45	190	110	0.8	DN**1504...
C6ADJNR/L45135-15N (2)	63	135	41	45	190	110	0.8	DN**1504...

"-" in Min $ød_1$ and $ød_2$: not suitable for internal boring

(1) Applicable for 3 MPa pressure coolant (2) Applicable for 7 MPa pressure coolant

C-PDJNR/L

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

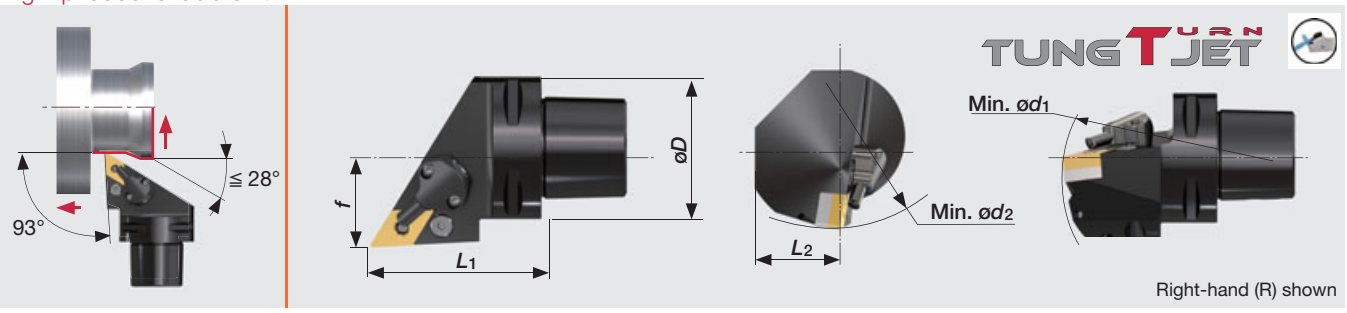


Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	r_ε	Insert
C5PDJNR/L35060-15N	50	60	32	35	165	110	0.8	DN**1504...
C6PDJNR/L45065-15N	63	65	41	45	195	95	0.8	DN**1504...

Applicable for 7 MPa pressure coolant

C-PDJNR/L-CHP

Lever lock type toolholder with TungCap connection, for negative 55° rhombic inserts, with channels for high pressure coolant

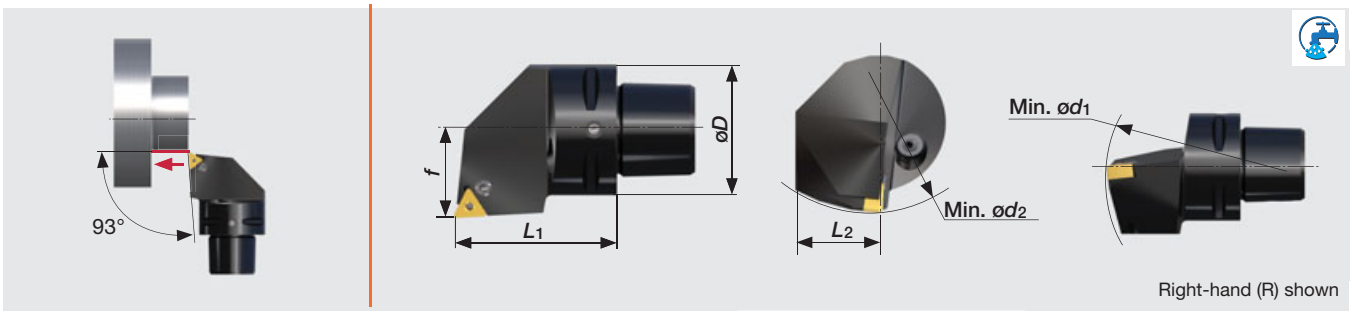


Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	r_ε	Insert
C4PDJNR/L27055-1104-CHP	40	55	27	27	145	110	0.8	DN**1104...
C4PDJNR/L27055-15-CHP	40	55	27	27	145	110	0.8	DN**1504...
C5PDJNR/L35060-15-CHP	50	60	32	35	165	110	0.8	DN**1504...
C6PDJNR/L45065-1104-CHP	63	65	35	45	195	95	0.8	DN**1104...
C6PDJNR/L45065-15-CHP	63	65	35	45	190	95	0.8	DN**1504...

Applicable for 14 MPa pressure coolant

C-PTJNR/L

Lever lock type toolholder with 93° approach angle, for negative triangle insert



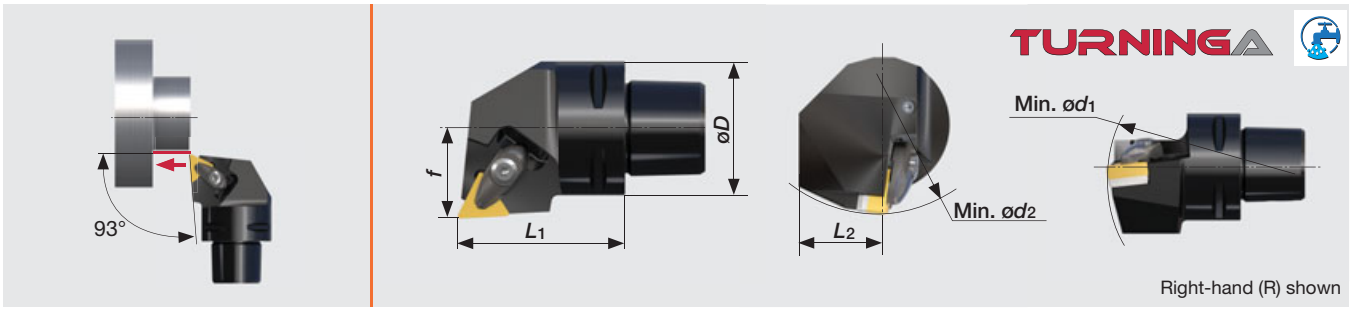
Right-hand (R) shown

Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	r_ε	Insert
C4PTJNR/L27050-1104N	40	50	25	27	140	110	0.8	TN**1104...

Applicable for 7 MPa pressure coolant

C-ATJNR/L

TurningA double-clamping toolholder with 93° approach angle, for negative triangle insert



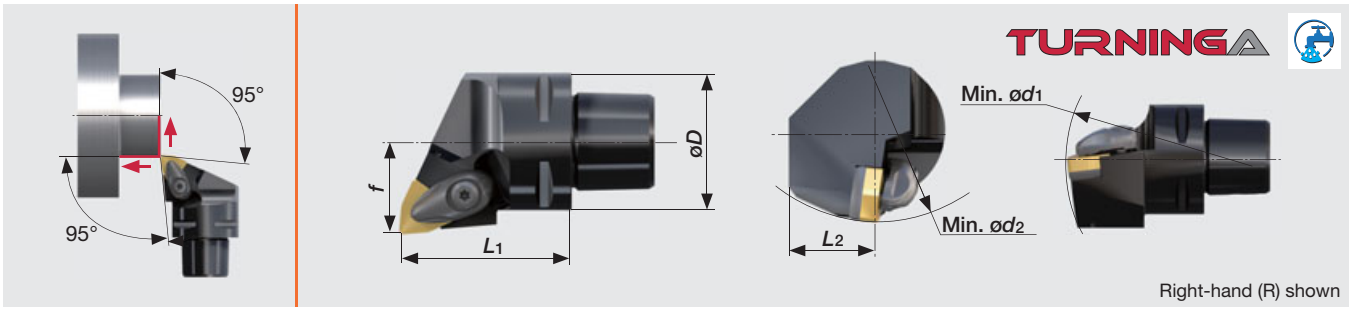
Right-hand (R) shown

Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	r_ε	Insert
C4ATJNR/L27050-16N	40	50	25	27	140	110	0.8	TN**1604...

Applicable for 7 MPa pressure coolant

C-AWLNR/L

TurningA double-clamping toolholder with 95° approach angle, for negative trigon inserts



Right-hand (R) shown

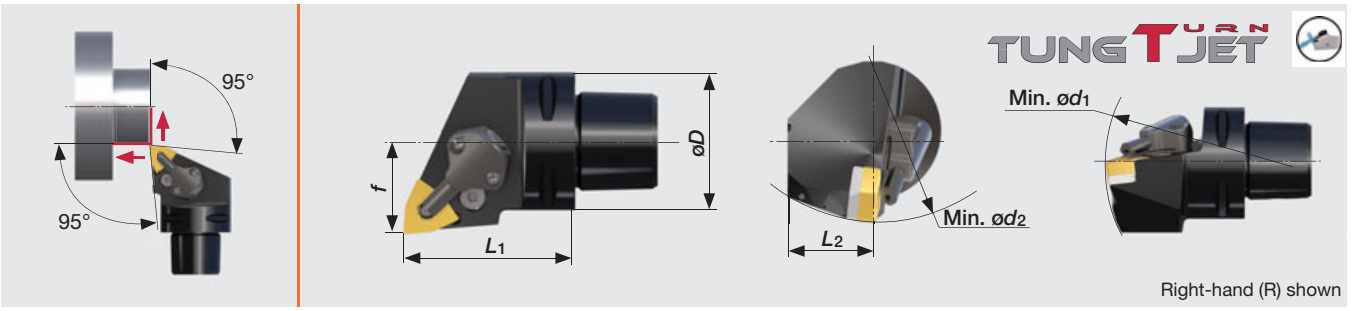
Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	r_ε	Insert
C4AWLNR/L27050-0604N	40	50	25	27	140	110	0.8	WN**0604...
C4AWLNR/L27050-08N	40	50	25	27	-	-	0.8	WN**0804...
C6AWLNR/L45065-08N	63	65	35	45	190	110	0.8	WN**0804...

Applicable for 7 MPa pressure coolant

"-" in Min $ød_1$ and $ød_2$: not suitable for internal boring

C-PWLNR/L-CHP

Lever lock type toolholder with TungCap connection, for negative 80° trigon inserts, with channels for high pressure coolant



Right-hand (R) shown

Metric	øD	L_1	L_2	f	$ød_1$	$ød_2$	r_ε	Insert
C4PWLNR/L27050-0604-CHP	40	50	25	27	140	110	0.8	WN**0604...
C4PWLNR/L27050-08-CHP	40	50	25	27	140	110	0.8	WN**0804...
C6PWLNR/L45065-08-CHP	63	65	41	45	190	110	0.8	WN**0804...

Applicable for 14 MPa pressure coolant

SPARE PARTS FOR A-TYPE








Designation	Insert	Shim	Shim screw	Clamp	Clamping screw	Spring	Spring 1	Wrench	Coolant parts
C*ACLNR/L	CN**0904...	ASC322	CSTB-3.5	ACP3S-E	ACS-5W	BP-7	SP-2.5	T-15F	SATZ-M10X1-5
C*ACLNR/L	CN**1204...	ASC422	CSTB-3.5	ACP4S	ACS-5W	BP-7	SP-2.5	T-15F	SATZ-M10X1-5
C*ADJNR/L	DN**1104...	ASD322	CSTB-3.5	ACP3S-E	ACS-5W	BP-7	SP-2.5	T-15F	SATZ-M10X1-5
C*ADJNR/L	DN**1504...	ASD432	CSTB-3.5	ACP4S	ACS-5W	BP-7	SP-2.5	T-15F	SATZ-M10X1-5
C*ADJNR/L	DN**1506...	ASD423	CSTB-3.5	ACP4S	ACS-5W	BP-7	SP-2.5	T-15F	SATZ-M10X1-5
C4ATJNR/L	TN**1604...	AST322	CSTB-3.5	ACP3S	ACS-5W	BP-7	SP-2.5	T-15F	-
C*AWLNR/L	WN**0604...	ASW322	CSTB-3.5	ACP3S-E	ACS-5W	BP-7	SP-2.5	T-15F	-
C*AWLNR/L	WN**0804...	ASW422	CSTB-3.5	ACP4S	ACS-5W	BP-7	SP-2.5	T-15F	-

SPARE PARTS FOR P-TYPE






Designation	Insert	Shim	Spring pin	Lever	Clamping screw	Wrench	Coolant parts
C*PCLNR/L	CN**1204...	LSC42	LSP4	LCL4	LCS4	P-3	SAZ-M8X1-M3
C*PDJNR/L	DN**1504...	LSD43A	LSP4	LCL4	LCS4	P-3	SATZ-M10X1-5
C*PDJNR/L	DN**1506...	LSD42A	LSP4S	LCL4	LCS4	P-3	SATZ-M10X1-5
C4PTJNR/L	TN**1140...	-	-	LCL23	LCS23A	P-2.5	SAZ-M8X1-M3

SPARE PARTS FOR CHP-TYPE





Designation	Insert	Shim	Spring pin	Lever	Clamping screw	Wrench
C*PCLNR/L...0904-CHP	CN**0904...	LSC317	LSP3	LCL33	LCS3	P-2.5
C*PCLNR/L...-12-CHP	CN**1204...	LSC42	LSP4	LCL4	LCS4	P-3
C*PDJNR/L...1104-CHP	DN**1104...	ELSD32	LSP3	LCL33L	LCS3	P-2.5
C*PDJNR/L...-15-CHP	DN**1504...	LSD43A	LSP4	LCL4	LCS4	P-3
C*PDJNR/L...-15-CHP	DN**1506...	LSD42A	LSP4	LCL4	LCS4	P-3
C*PWLNR/L...0604-CHP	WN**0604...	LSW312	LSP3	LCL3	LCS3	P-2.5
C*PWLNR/L...-08-CHP	WN**0804...	LSW42BL	LSP4	LCL4	LCS4	P-3

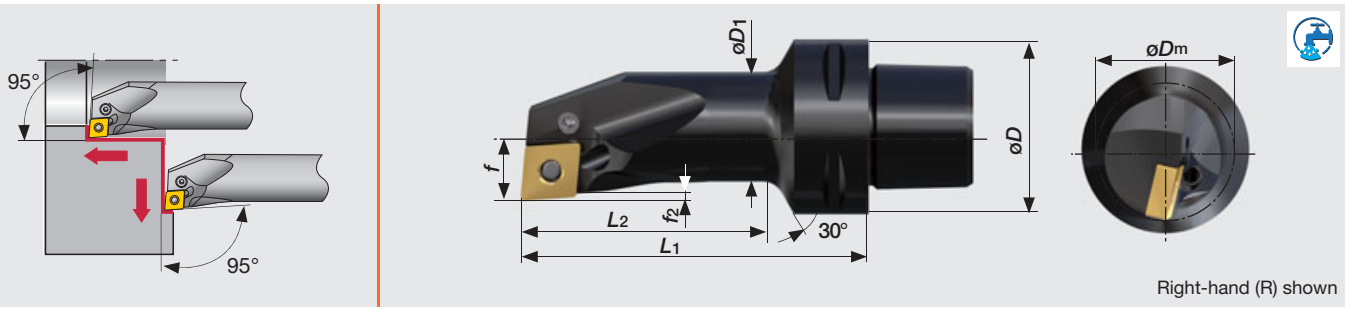
COOLANT SET




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

C-PCLNR/L

Lever lock type boring bar, for negative 80° rhombic inserts



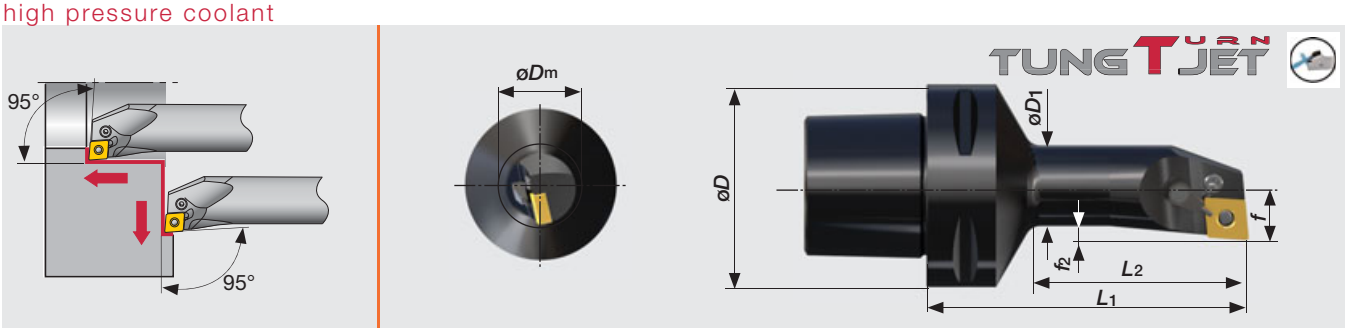
Right-hand (R) shown

Metric	øDm	øD	øD1	L1	L2	f	f2	rε	Insert
C4PCLNR17090-0904	32	40	25	90	63	17	1.3	0.8	CN**0904...
C4PCLNR/L17080-12	32	40	25	80	58.5	17	1.6	0.8	CN**1204...
C4PCLNR22110-0904	40	40	32	110	86.5	22	1.3	0.8	CN**0904...
C4PCLNR27120-0904	50	40	39.5	120	100	27	1.7	0.8	CN**0904...

Applicable for7 MPa pressure coolant

C-PCLNL-CHP

Lever lock type toolholder with TungCap connection, for negative 80° rhombic inserts, with channels for high pressure coolant

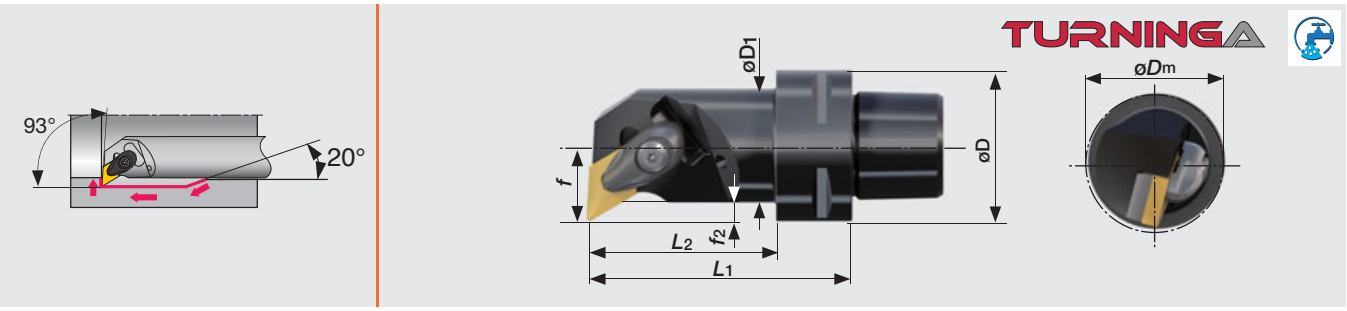


Metric	øDm	øD	øD1	L1	L2	f	f2	rε	Insert
C6PCLNL17100-12-CHP	32	63	25	100	67.5	17	4.5	0.8	CN**1204...

Applicable for 7 MPa pressure coolant

C-ADUNR

TurningA double-clamp boring bar, for negative 55° rhombic inserts

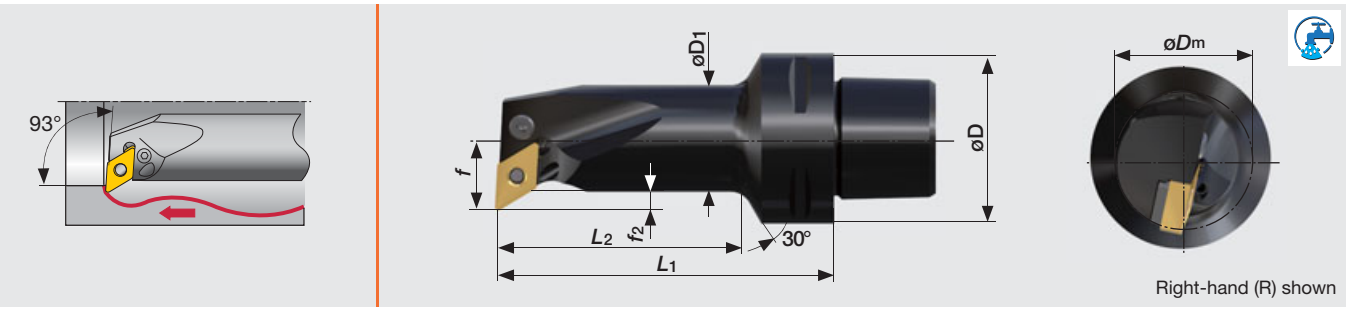


Metric	øDm	øD	øD1	L1	L2	f	f2	rε	Insert
C4ADUNR20070-15	38	40	30	70	50	20	5	0.8	DN**1504...
C4ADUNR27090-15	50	40	40	90	-	27	7	0.8	DN**1504...

Applicable for 7 MPa pressure coolant

C-PDUNR/L

Lever lock type boring bar, for negative 55° rhombic inserts



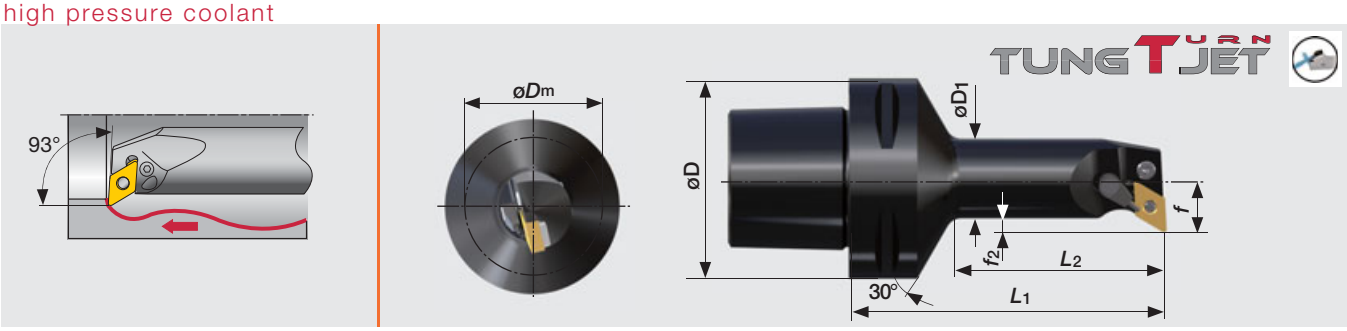
Right-hand (R) shown

Metric	øDm	øD	øD1	L1	L2	f	f2	rε	Insert
C4PDUNR/L17080-11	32	40	25	80	58.5	17	4.4	0.4	DN**1104...

Applicable for 7 MPa pressure coolant

C-PDUNL-CHP

Lever lock type toolholder with TungCap connection, for negative 55° rhombic inserts, with channels for high pressure coolant



Metric	øDm	øD	øD1	L1	L2	f	f2	rε	Insert
C6PDUNL17100-1104-CHP	32	63	25	100	67.5	17	4.5	0.8	DN**1104...

Applicable for 7 MPa pressure coolant

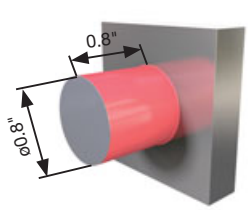
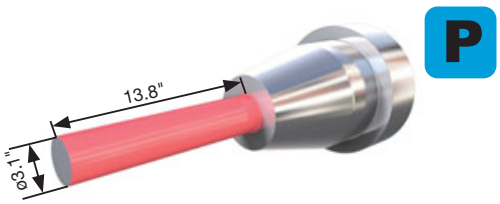
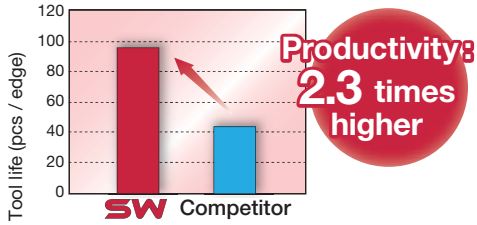
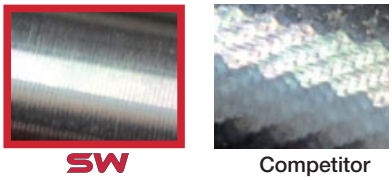
SPARE PARTS FOR A-TYPE

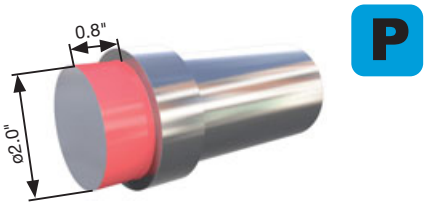
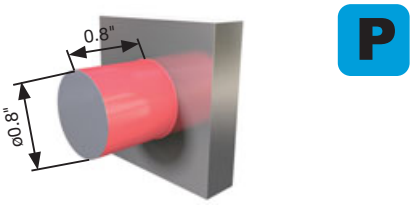
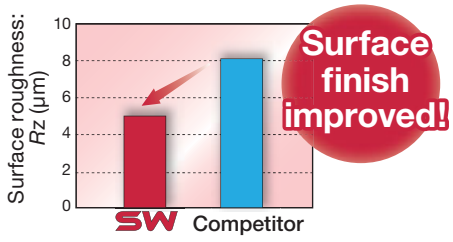
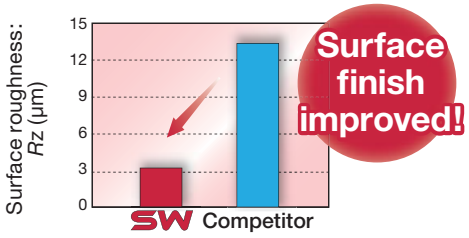
Designation	Insert	Clamp	Clamping screw	Shim screw	Shim	Spring	Spring pin	Wrench
C4ADUNR	DNMG**15...	ACP4S	CSTB-3.5	ACS-5W	ASD423	BP-7	SP-2.5	T-15F

SPARE PARTS FOR P-TYPE (CN** Insert)

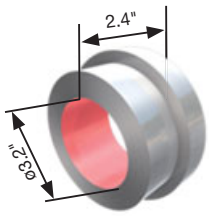
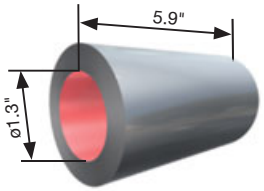
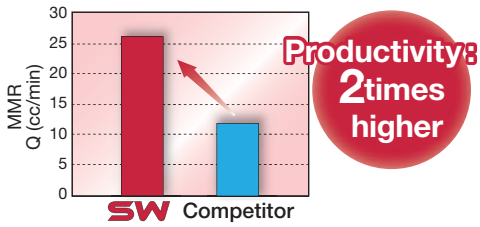
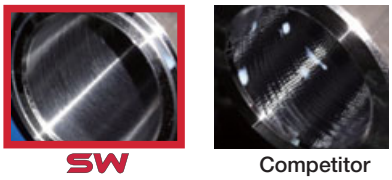
Designation	Insert	Shim	Shim screw	Spring pin	Lever	Wrench	Coolant unit
C*PCLNR17...0904	CN**0904...	-	LCS33	-	LCL33N	P-2F	-
C*PCLNR/L17...12	CN**1204...	-	LCS43	-	LCL43N	P-2.5F	-
C*PCLNR22/27...0904	CN**0904...	LSC317	LCS3	LSP3	LCL33	P-2.5F	-
C*PCLNL17-CHP	CN**1204...	-	LCS43	-	LCL43N	P-2.5F	S-CU-CHP
C4PDUNR/L17...	DN**1104...	ELSD317BR	LCS33	LSP3	LCL33L	P-2.5	-
C6PDUNL-CHP	DN**1104...	ELSD317BL	LCS43	LSP3	LCL33L	P-2.5	S-CU-CHP

PRACTICAL EXAMPLES

Workpiece type		Ball nut	Mold parts
Insert		CNMG432-SW	CNMG432-SW
Grade		T9125	T9115
Workpiece material		Low carbon alloy	1040
			
Cutting conditions	Cutting speed: *Vc* (sfm)	427	919
	Feed : *f* (ipr)	0.018	0.020
	Depth of cut : *ap* (in)	0.07	0.08
	Coolant	Wet	Wet
Results		 SW chipbreaker allows high feed machining, which increases productivity by 2.3 times compared to the competitor.	**Stable cutting!**  SW chipbreaker provides stable machining without chattering, so the surface finish is better than the competitor.

Workpiece type		Intermediate shaft	Valve parts
Insert		CNMG432-SW	CNMG432-SW
Grade		T9105	T9105
Workpiece material		Low carbon alloy	4140
			
Cutting conditions	Cutting speed: *Vc* (sfm)	670	492
	Feed : *f* (ipr)	0.016	0.012
	Depth of cut : *ap* (in)	0.08	0.04 x 5 passes
	Coolant	Wet	Wet
Results		 SW chipbreaker improves surface finish by 40% even under the same cutting condition as the competitor's.	 SW chipbreaker provides better surface finish even under the same cutting condition as the competitor's. As a result, finishing operation can be skipped.

PRACTICAL EXAMPLES

Workpiece type		Differential gear	Roll
Insert		CCMT09T304-SW	CCMT09T308-SW
Grade		NS9530	T9115
Workpiece material		Low carbon alloy	1040
		 P	 P
Cutting conditions	Cutting speed: *Vc* (sfm)	853	820
	Feed : *f* (ipr)	0.008	0.014
	Depth of cut : *ap* (in)	0.020	0.020
	Coolant	Wet	Wet
Results		 The positive insert with the SW chipbreaker removed twice the amount of metal compared to competitor's non-wiper insert, with tool life and surface finish quality being equal.	**Stable cutting!**  The positive insert with the SW chipbreaker has eliminated chatters and stabilized tool life.

MEMO

Check our site and our App to get more info!

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