

TETRAM^NCUT/TETRA^{FORCE}CUT

www.tungaloy.com

Tungaloy Report No. 416-G

Durable and economical tool
for grooving and parting-off



INDUSTRY 4.0
FEED the SPEED!



ACCELERATED MACHINING

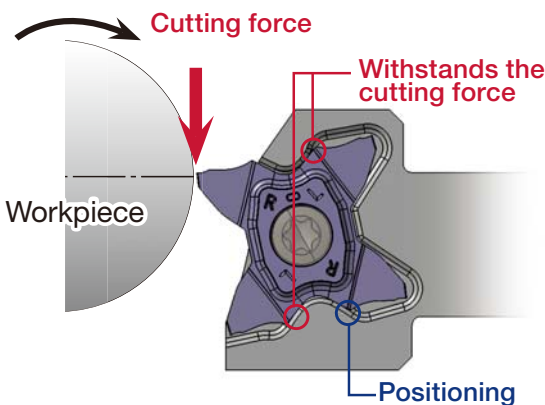


TetraMini-Cut / TetraForce-Cut brings innovation to grooving. Ground insert clamps into uniquely designed pocket, providing high insert stability as well as repeatability.

Multi-purpose grooving line with economical insert with 4 cutting edges

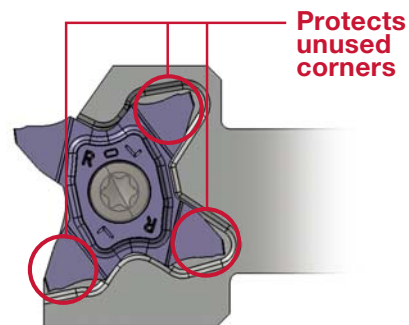
Unique 3-point clamping system

The unique pocket design provides accurate indexing repeatability of the cutting edge height.



The insert pocket protects all unused cutting edges

Strong and stable clamping design protects unused insert corners from damage during operation.



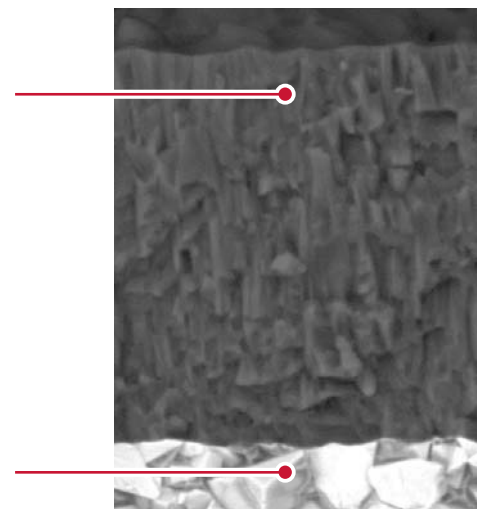
AH7025 ideal grade for grooving application



AH7025 uses the world's first coating technology of a nano-scale multi-layered AlTiN PVD coating with high Al content, featuring

- Coating hardness increased by 20%
- A multi-layered coating structure impedes micro-crack propagation, reducing insert failures
- Enhanced adhesion strength between the coating and carbide substrate layer

High wear and fracture resistant carbide substrate for optimal grooving performance



The result : a dramatic increase in tool life and machining stability

New**TETRAMCUT** Groove widths: 0.33 - 3 mm

See PG. 6

- Available in AH7025, AH725, and SH725 to cover various applications
- 3 different types of chipbreakers each with dedicated edge preparation

DIRECTT^{UNE}JET

- Toolholders featuring a hose-free, direct through-coolant supply system
- Flexible tool to accommodate standard CNC lathes as well as Swiss-type machines
- The same toolholder can carry a threading insert with the pitch ranging from 0.4 to 3 mm

**TETRAFORCE** Groove widths: 0.5 - 3.18 mm

See PG. 18

- Available in 2 standard types of chipbreakers for optimal chip control
- General-purpose, AH725 grade for various types of application
- Through-coolant supply system (tool code suffix "-CHP") to ensure high efficient machining

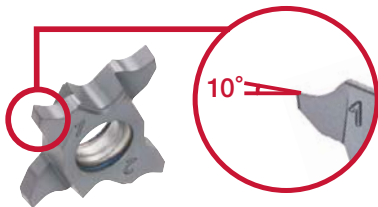


Major expansion to the TCG-style chipbreaker line Enhanced lineup for greater flexibility

- An expanded range of tools allows for an easy selection of the ideal insert
- The same toolholder for both grooving and threading

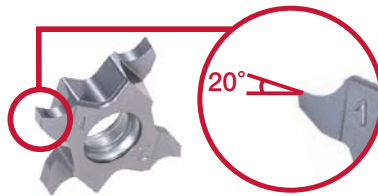
Grooving

TCG type (Honed edge)



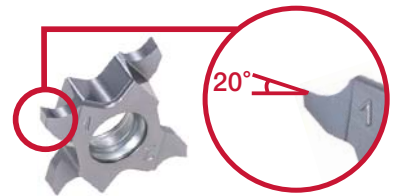
- Optimized rake angle and edge preparation enhances fracture resistance, allowing for smooth cutting
- AH7025 grade features a superior combination of wear and fracture resistances

TCP type (Lightly honed edge)



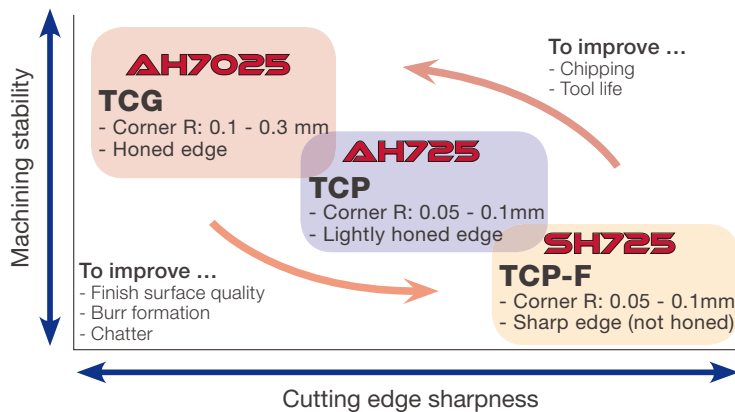
- A large rake angle ensures smooth cutting for excellent surface finish
- The insert in grade AH725 features a tough edge preparation for high resistance to fracture

TCP-F type (Sharp edge)



- High quality surface finish and precision thanks to the sharp cutting edge
- A quality level equivalent to that with cermet is achievable
- An extremely hard coating layer on grade SH725 provides sharp cutting edges, making it perfect for small part grooving

New selection system



- Choose the best of all three insert types according to the machining requirements
- A variety of widths and corner radii are available in all three insert types

Threading

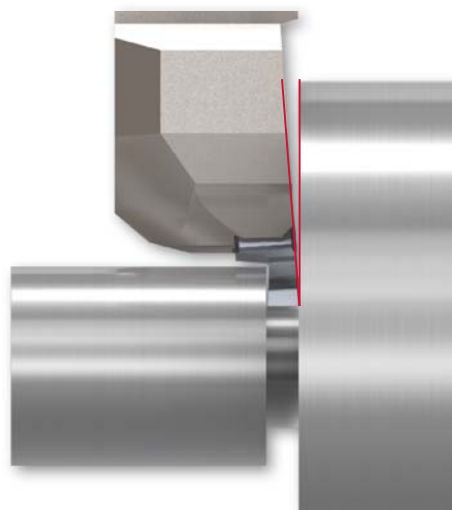
TCT type



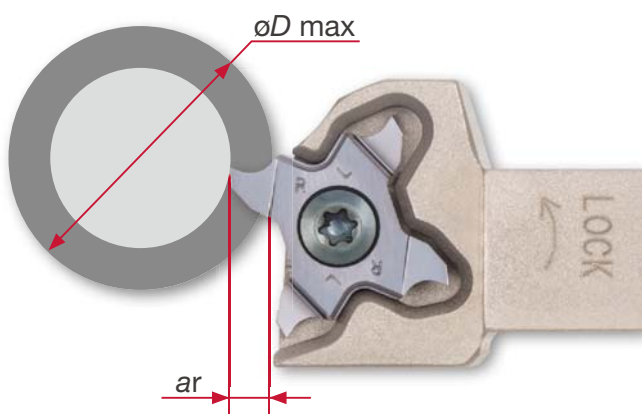
- Sharp cutting edge ensures smooth cutting, minimizing burr formation
- Applicable for a wide variety of threading operations

PRECISION GROOVING & THREADING

Machining next to shoulder

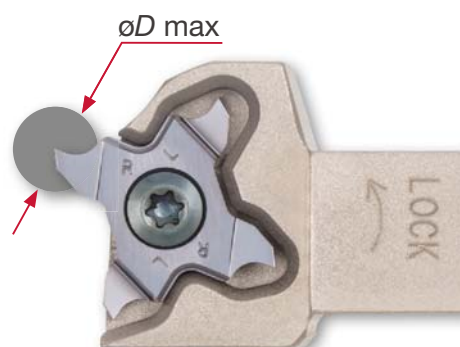


Groove depth capacity and Dmax. capacity



Groove depth ar (mm)	Max. diameter øDmax (mm)
3.1	∞
3.2	650
3.3	250
3.4	150
3.5	80

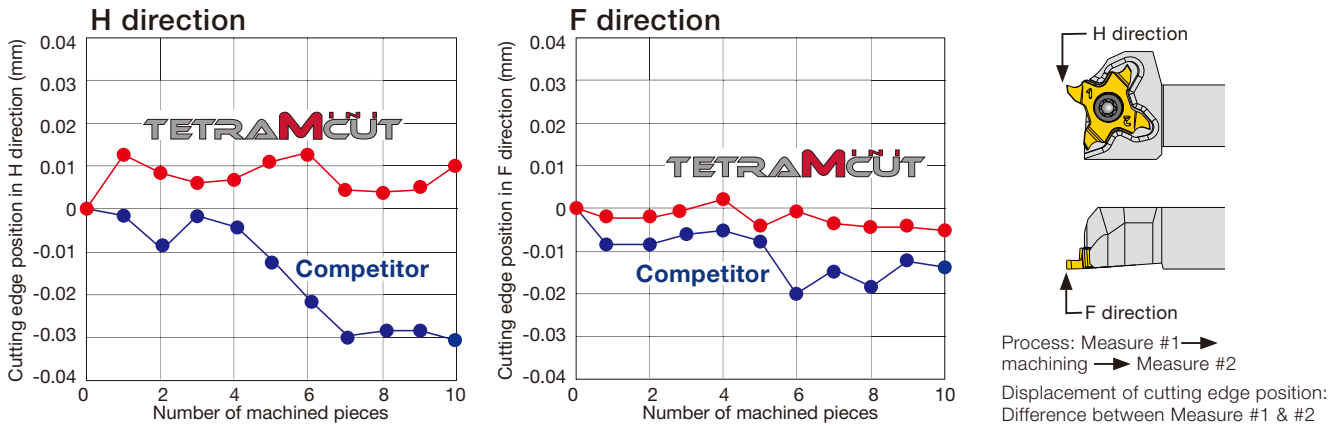
Dmax. parting-off



Max. diameter øDmax (mm)
7

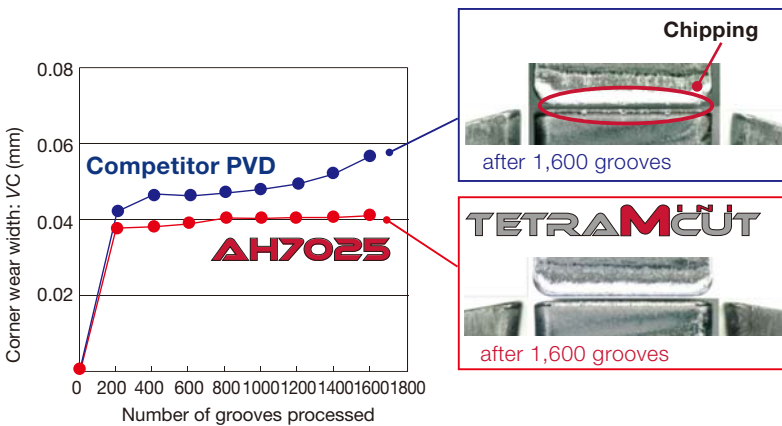
CUTTING PERFORMANCE

Tool rigidity



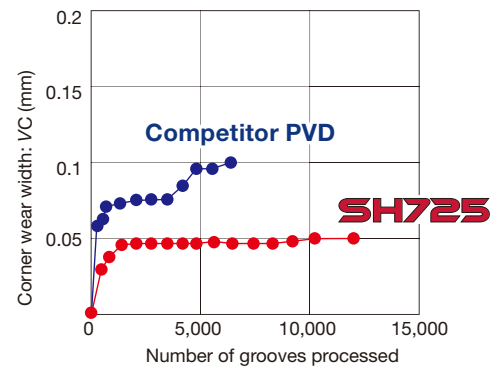
Tool life

P Alloy steel



Toolholder : STCR2525Z18
Insert : TCG18R200-020 AH7025
Workpiece material : SCM440 / 42CrMo4
Cutting speed : $V_c = 180$ m/min
Feed : $f = 0.07$ mm/rev

M Stainless steel



Toolholder : STCR1010X18
Insert : TCP18R200F-010 SH725
Workpiece material : SUS304 / X5CrNi18-9
Cutting speed : $V_c = 120$ m/min
Feed : $f = 0.05$ mm/rev

Chip control

M Stainless steel

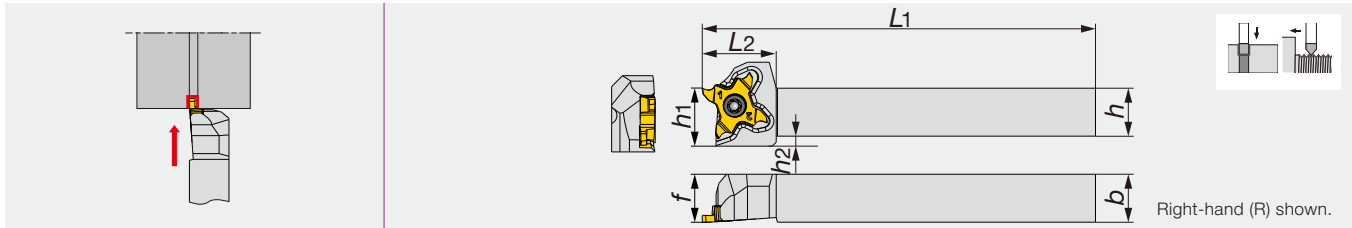
Cutting speed: V_c (m/min)	Feed: f (mm/rev)					
	0.03	0.05	0.07	0.03	0.05	0.07
120						
80						

Toolholder : STCR1010X18
Insert : TCP18R200F-010 AH725
Workpiece material : SUS303 / X10CrNiS18-9
Groove width : $W = 2$ mm

Precision grooving tools with uniquely shaped insert for swiss type machine and general lathes

TOOLHOLDER - FOR GROOVING AND THREADING

TetraMini-Cut STCR/L-18



Designation	<i>h</i>	<i>b</i>	<i>L</i> ₁	<i>L</i> ₂	<i>h</i> ₁	<i>f</i>	<i>h</i> ₂	Insert
STCR/L1010X18	10	10	120	18.5	10	10	4.5	TC*18...
STCR/L1212F18	12	12	85	18.5	12	12	2.5	TC*18...
STCR/L1212X18	12	12	120	18.5	12	12	2.5	TC*18...
STCR/L1616X18	16	16	120	18.5	16	16	0	TC*18...
STCR/L2020H18	20	20	100	18.5	20	20	0	TC*18...
STCR/L2020X18	20	20	120	23.0	20	25	0	TC*18...
STCR/L2525Z18	25	25	135	23.0	25	30	0	TC*18...

- The right-hand toolholder (STCR...) is used with the right-hand insert (TC*18R...), and the left-hand toolholder (STCL...) is used with the left-hand insert (TC*18L...).

Left-Hand Insert



TCP18**L**...

Right-Hand Insert



TCP18**R**...

SPARE PARTS



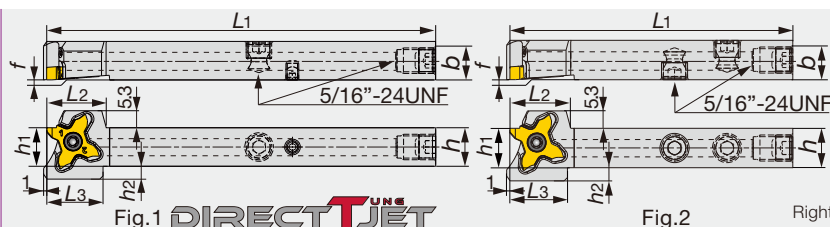
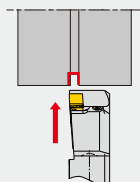
Designation	Clamping screw	Wrench
STCR...18	CSTC-4L100DL	T-1008/5
STCL...18	CSTC-4L100DR	T-1008/5

External grooving and threading toolholder, high pressure coolant compatible

TOOLHOLDER - FOR GROOVING AND THREADING

TetraMini-Cut STCR/L-18

New



Right-hand (R) shown.

Designation	h	b	L1	L2	L3	h1	f	h2	Fig.	Insert	Torque*
STCR/L1212F18-CHP	12	12	85	18.5	17.5	12	0/12	4	2	TC*18...	1.2
STCR/L1212X18-CHP	12	12	120	18.5	17.5	12	0/12	4	1	TC*18...	1.2
STCR/L1616X18-CHP	16	16	120	18.5	-	16	0/16	0	1	TC*18...	1.2

- The right hand insert (TC*18R***) is used for the right hand toolholders (STCR***), and the left hand insert (TC*18L***) is used for the left hand toolholders (STCL***).

*Torque: Recommended torque (N·m) for clamping

SPARE PARTS



Designation	Clamping screw	Wrench
STCL**18-CHP	CSTC-4L100DR	T-1008/5
STCR**18-CHP	CSTC-4L100DL	T-1008/5

Groove width range : 0.33 - 3.0 mm
Threading pitch range : 0.8 - 3.0 mm

New

DIRECTTUNGJET system

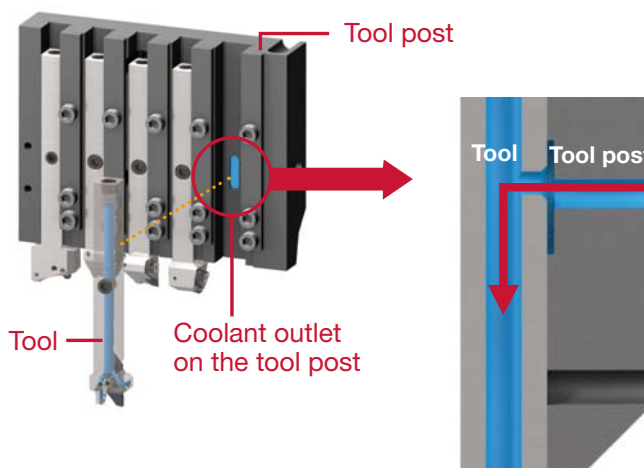
Tube-less design streamlines tool setups
Through-coolant supply enables high productivity

DirectTungJet system



No need for coolant tube setups.
Eliminates chip entanglement on tubes
and streamlines tool replacements.

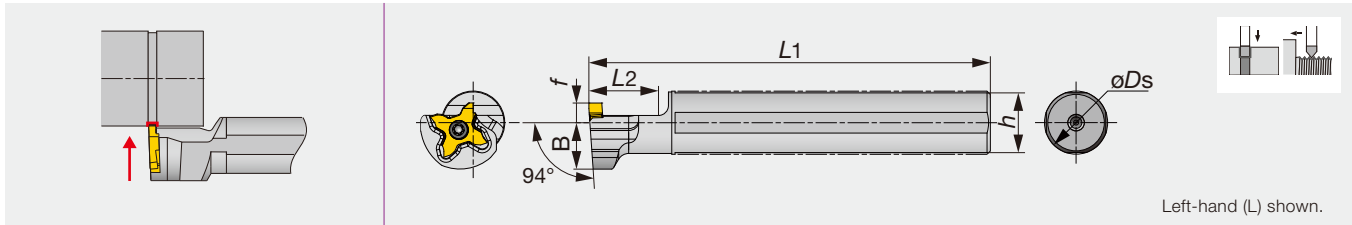
Coolant is supplied from the tool post
directly to the tools



Precision grooving tools with uniquely shaped insert for swiss type machine and general lathes

TOOLHOLDER - ROUND SHANK FOR GROOVING AND THREADING

TetraMini-Cut JS-STCL18



Designation	ϕD_s	L_1	L_2	h	B	f	Insert
JS14H-STCL18	14	100	20	13	14	6	TC*18...
JS159F-STCL18	15.875	85	20	15	14	6	TC*18...
JS16F-STCL18	16	85	20	15	14	6	TC*18...
JS19G-STCL18	19.05	90	20	18	14	6	TC*18...
JS19X-STCL18	19.05	120	20	18	14	6	TC*18...
JS20G-STCL18	20	90	20	19	14	6	TC*18...
JS20X-STCL18	20	120	20	19	14	6	TC*18...
JS22X-STCL18	22	120	20	21	12.25	10	TC*18...
JS25H-STCL18	25	100	20	24	12.25	10	TC*18...
JS254X-STCL18	25.4	120	20	24	12.25	10	TC*18...

- The left hand toolholder (STCL***) is used with the right hand inserts (TC*18R***)

SPARE PARTS



Designation	Clamping screw	Wrench
JS...STCL18	CSTC-4L100DL	T-1008/5

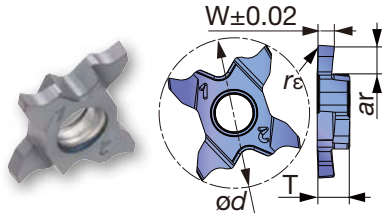
Selection guide for TetraMini-Cut inserts

Groove width W (mm)	Corner rad. r _c (mm)	TCG18R/L (P.13)	TCP18R/L (P.14)	TCP18R/L-F (P.15)
		AH7025	AH725	SH725
		Honed edge	Lightly honed edge	Sharp edge
0.33	0.05		●	●
0.43	0.05		●	●
0.50	0.05		●	●
0.75	0.05		●	●
0.95	0.05		●	●
1.00	0.05			●
	0.1	New ●	●	●
1.20	0.05			●
	0.1	New ●	●	●
1.25	0.05			●
	0.1	New ●	●	●
	0.2	●		
1.30	0.2	New ●		
1.40	0.1	New ●	New ●	New ●
	0.2	New ●		
1.45	0.05			●
	0.1	New ●	●	●
	0.2	New ●		
1.50	0.05			●
	0.1	New ●	●	●
	0.2	●		
1.60	0.2	New ●		
1.70	0.2	New ●		
1.75	0.05			●
	0.1	New ●	●	●
	0.2	●		
1.85	0.2	●		
1.95	0.2	New ●		
2.00	0.05			●
	0.1	●	●	●
	0.2	●		
2.25	0.2	New ●		
2.30	0.2	New ●		
2.50	0.1	New ●	●	●
	0.2	New ●		
	0.3	●		
2.65	0.3	New ●		
2.80	0.3	New ●		
3.00	0.1	New ●	●	●
	0.2	●		
	0.3	●		

● : New product
● : Line up

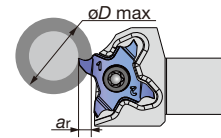
INSERTS

TCG18R/L (honed edge)

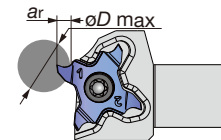


Designation	Grade AH7025		W	Dimensions (mm)			
	R	L		r_ϵ	a_r	T	ϕd
New TCG18R/L100-010	●	●	1	0.1	2	4	18
New TCG18R/L120-010	●	●	1.2	0.1	2	4	18
New TCG18R/L125-010	●	●	1.25	0.1	2	4	18
TCG18R/L125-020	●	●	1.25	0.2	2	4	18
New TCG18R/L130-020	●	●	1.3	0.2	2	4	18
New TCG18R/L140-010	●	●	1.4	0.1	3.5*	4	18
New TCG18R/L140-020	●	●	1.4	0.2	3.5*	4	18
New TCG18R/L145-010	●	●	1.45	0.1	3.5*	4	18
New TCG18R/L145-020	●	●	1.45	0.2	3.5*	4	18
New TCG18R/L150-010	●	●	1.5	0.1	3.5*	4	18
TCG18R/L150-020	●	●	1.5	0.2	3.5*	4	18
New TCG18R/L160-020	●	●	1.6	0.2	3.5*	4	18
New TCG18R/L170-020	●	●	1.7	0.2	3.5*	4	18
New TCG18R/L175-010	●	●	1.75	0.1	3.5*	4	18
TCG18R/L175-020	●	●	1.75	0.2	3.5*	4	18
TCG18R/L185-020	●	●	1.85	0.2	3.5*	4	18
New TCG18R/L195-020	●	●	1.95	0.2	3.5*	4	18
TCG18R/L200-010	●	●	2	0.1	3.5*	4	18
TCG18R/L200-020	●	●	2	0.2	3.5*	4	18
New TCG18R/L225-020	●	●	2.25	0.2	3.5*	4	18
New TCG18R/L230-020	●	●	2.3	0.2	3.5*	4	18
New TCG18R/L250-010	●	●	2.5	0.1	3.5*	4	18
New TCG18R/L250-020	●	●	2.5	0.2	3.5*	4	18
TCG18R/L250-030	●	●	2.5	0.3	3.5*	4	18
New TCG18R/L265-030	●	●	2.65	0.3	3.5*	4	18
New TCG18R/L280-030	●	●	2.8	0.3	3.5*	4	18
New TCG18R/L300-010	●	●	3	0.1	3.5*	4	18
TCG18R/L300-020	●	●	3	0.2	3.5*	4	18
TCG18R/L300-030	●	●	3	0.3	3.5*	4	18

● : Line up



Groove depth a_r (mm)	Max. diameter ϕD_{max} (mm)
3.1	∞
3.2	650
3.3	250
3.4	150
3.5	80

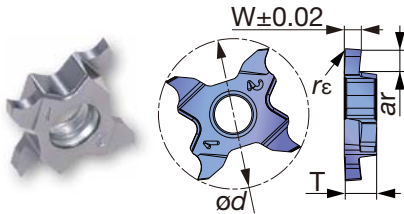


Max. diameter ϕD_{max} (mm)
7

*Groove depth and max workpiece diameter (ϕD_{max})
Maximum workpiece diameter is limited relative to depth of cut in order to avoid collision between insert and workpiece.

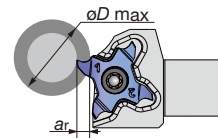
INSERTS

TCP18R/L (lightly honed edge)

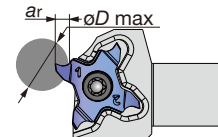


Designation	Grade AH725		W	Dimensions (mm)			
	R	L		r _ε	a _r	T	ød
TCP18R/L033-005	●	●	0.33	0.05	0.8	4	18
TCP18R/L043-005	●	●	0.43	0.05	1.2	4	18
TCP18R/L050-005	●	●	0.5	0.05	1.2	4	18
TCP18R/L075-005	●	●	0.75	0.05	2	4	18
TCP18R/L095-005	●	●	0.95	0.05	2	4	18
TCP18R/L100-010	●	●	1	0.1	2	4	18
TCP18R/L120-010	●	●	1.2	0.1	2	4	18
TCP18R/L125-010	●	●	1.25	0.1	2	4	18
New TCP18R/L140-010-35	●	●	1.4	0.1	3.5*	4	18
TCP18R/L145-010	●	●	1.45	0.1	2.5	4	18
TCP18R/L145-010-35	●	●	1.45	0.1	3.5*	4	18
TCP18R/L150-010	●	●	1.5	0.1	2.5	4	18
TCP18R/L150-010-35	●	●	1.5	0.1	3.5*	4	18
TCP18R/L175-010	●	●	1.75	0.1	2.5	4	18
TCP18R/L175-010-35	●	●	1.75	0.1	3.5*	4	18
TCP18R/L200-010	●	●	2	0.1	2.5	4	18
TCP18R/L200-010-35	●	●	2	0.1	3.5*	4	18
TCP18R/L250-010	●	●	2.5	0.1	2.5	4	18
TCP18R/L250-010-35	●	●	2.5	0.1	3.5*	4	18
TCP18R/L300-010	●	●	3	0.1	2.5	4	18
TCP18R/L300-010-35	●	●	3	0.1	3.5*	4	18

● : Line up



Groove depth a _r (mm)	Max. diameter øD _{max} (mm)
3.1	∞
3.2	650
3.3	250
3.4	150
3.5	80

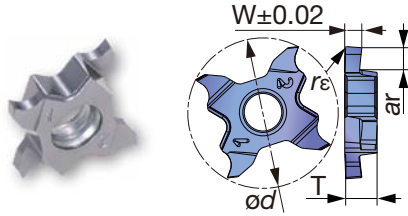


Max. diameter øD _{max} (mm)
7

***Groove depth and max workpiece diameter (øD_{max})**
Maximum workpiece diameter is limited relative to depth of cut in order to avoid collision between insert and workpiece.

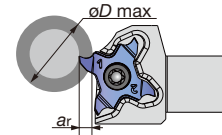
INSERTS

TCP18R/L-F (sharp edge)

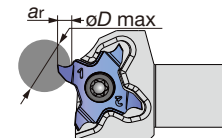


Designation	Grade SH725		W	Dimensions (mm)			
	R	L		r_ϵ	a_r	T	ϕd
TCP18R/L033F-005	●	●	0.33	0.05	0.8	4	18
TCP18R/L043F-005	●	●	0.43	0.05	1.2	4	18
TCP18R/L050F-005	●	●	0.5	0.05	1.2	4	18
TCP18R/L075F-005	●	●	0.75	0.05	2	4	18
TCP18R/L095F-005	●	●	0.95	0.05	2	4	18
TCP18R/L100F-005	●		1	0.05	2	4	18
TCP18R/L100F-010	●	●	1	0.1	2	4	18
TCP18R/L120F-005	●		1.2	0.05	2	4	18
TCP18R/L120F-010	●	●	1.2	0.1	2	4	18
TCP18R/L125F-005	●		1.25	0.05	2	4	18
TCP18R/L125F-010	●	●	1.25	0.1	2	4	18
New TCP18R/L140F-010-35	●		1.4	0.1	3.5*	4	18
TCP18R/L145F-005-35	●		1.45	0.05	3.5*	4	18
TCP18R/L145F-010	●	●	1.45	0.1	2.5	4	18
TCP18R/L145F-010-35	●	●	1.45	0.1	3.5*	4	18
TCP18R/L150F-005-35	●		1.5	0.05	3.5*	4	18
TCP18R/L150F-010	●	●	1.5	0.1	2.5	4	18
TCP18R/L150F-010-35	●	●	1.5	0.1	3.5*	4	18
TCP18R/L175F-005-35	●		1.75	0.05	3.5*	4	18
TCP18R/L175F-010	●	●	1.75	0.1	2.5	4	18
TCP18R/L175F-010-35	●	●	1.75	0.1	3.5*	4	18
TCP18R/L200F-005-35	●		2	0.05	3.5*	4	18
TCP18R/L200F-010-35	●	●	2	0.1	2.5	4	18
TCP18R/L200F-010-35	●	●	2	0.1	3.5*	4	18
TCP18R/L250F-010	●	●	2.5	0.1	2.5	4	18
TCP18R/L250F-010-35	●	●	2.5	0.1	3.5*	4	18
TCP18R/L300F-010	●	●	3	0.1	2.5	4	18
TCP18R/L300F-010-35	●	●	3	0.1	3.5*	4	18

● : Line up



Groove depth a_r (mm)	Max. diameter ϕD_{max} (mm)
3.1	∞
3.2	650
3.3	250
3.4	150
3.5	80

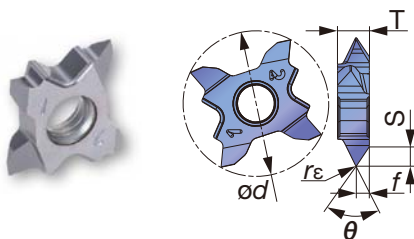


Max. diameter ϕD_{max} (mm)
7

*Groove depth and max workpiece diameter (ϕD_{max})
Maximum workpiece diameter is limited relative to depth of cut in order to avoid collision between insert and workpiece.

INSERTS

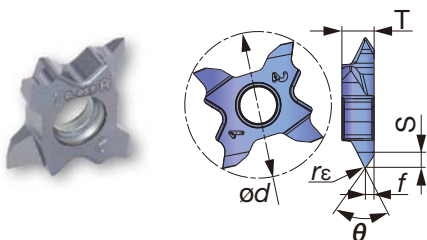
TCT18R/L (for threading / lightly honed edge)



Designation	Grade AH725		pitch min	pitch max	Dimensions (mm)					T	ød
	R	L			f	S	r _s	θ(°)			
TCT18R/L-60N-010	●	●	0.8	3	1.6	2.67	0.1	60	4	18	
TCT18R/L-60N-020	●	●	1.5	3	1.6	2.57	0.2	60	4	18	

● : Line up

TCT18FR (for threading /sharp edge)



Designation	Grade SH725		pitch min	pitch max	Dimensions (mm)					T	ød
	R	L			f	S	rε	θ(°)			
TCT18FR-60A-005	●		0.4	1	0.6	0.99	0.05	60	4	18	
TCT18FR-60A-010	●		1	2	1	1.63	0.1	60	4	18	

● : Line up

STANDARD CUTTING CONDITIONS

TCG18R/L (honed edge)

ISO	Workpiece materials	Grades	Cutting speed Vc (m/min)	Feed f (mm/rev)
P	Low carbon steel (S15C / C15, S20C / C20, etc.)	AH7025	80 - 180	0.03 - 0.12
	Carbon steels, Alloy steel (S55C / C55, SCM440 / 42CrMoS4, etc.)	AH7025	80 - 180	0.03 - 0.12
	Prehardened steel (NAK80, PX5, etc.)	AH7025	80 - 180	0.03 - 0.12
M	Stainless steel (SUS304 / X5CrNi18-9, X5CrNiMo17-12-2, etc.)	AH7025	50 - 120	0.03 - 0.12
K	Grey cast iron (FC250 / GG25 / 250, FC300 / GG30 / 300, etc.)	AH7025	50 - 180	0.03 - 0.12
	Ductile cast iron (FCD400 / 400-15, FCD600 / 600-3, etc.)	AH7025	50 - 180	0.03 - 0.12
S	Titanium alloys (Ti-6Al-4V, etc.)	AH7025	20 - 80	0.03 - 0.12
	Superalloys (Inconel718, etc.)	AH7025	20 - 80	0.03 - 0.12

TCP18R/L (lightly honed edge) / TCP18R/L-F (sharp edge)

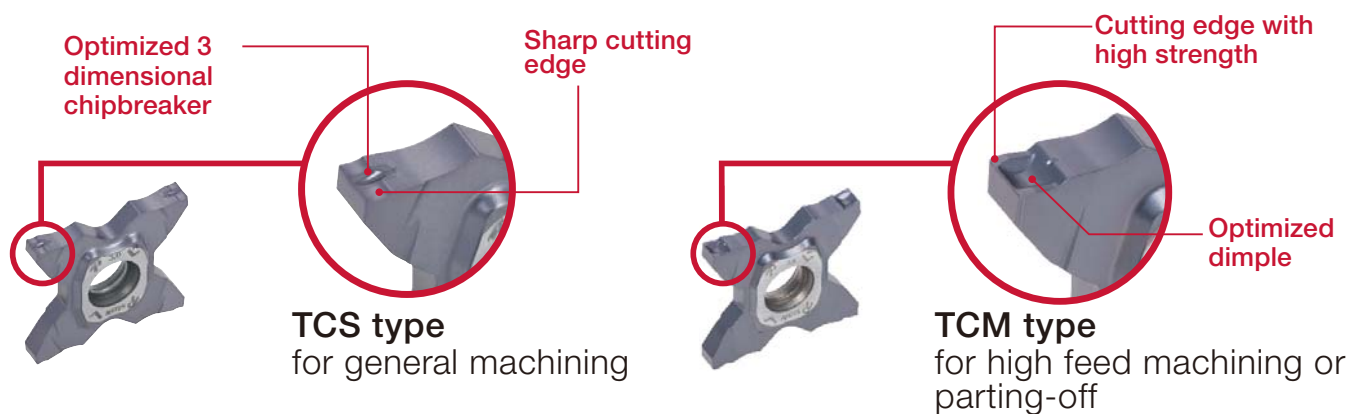
ISO	Workpiece materials	Priority	Grades	Cutting speed Vc (m/min)	Feed f (mm/rev)
P	Low carbon steel (S15C / C15, S20C / C20, etc.)	First choice	SH725	80 - 180	0.03 - 0.1
		Toughness	AH725	80 - 180	0.03 - 0.1
	Carbon steels, Alloy steel (S55C / C55, SCM440 / 42CrMoS4, etc.)	First choice	SH725	80 - 180	0.03 - 0.1
		Toughness	AH725	80 - 180	0.03 - 0.1
M	Prehardened steel (NAK80, PX5, etc.)	First choice	SH725	80 - 180	0.03 - 0.1
		Toughness	AH725	80 - 180	0.03 - 0.1
	Stainless steel (SUS304 / X5CrNi18-9, X5CrNiMo17-12-2, etc.)	First choice	SH725	50 - 120	0.03 - 0.1
		Toughness	AH725	50 - 120	0.03 - 0.1
K	Grey cast iron (FC250 / GG25 / 250, FC300 / GG30 / 300, etc.)	First choice	AH725	50 - 180	0.03 - 0.1
		Sharpness	SH725	50 - 180	0.03 - 0.1
	Ductile cast iron (FCD400 / 400-15, FCD600 / 600-3, etc.)	First choice	AH725	50 - 180	0.03 - 0.1
		Sharpness	SH725	50 - 180	0.03 - 0.1
S	Titanium alloys (Ti-6Al-4V, etc.)	First choice	SH725	20 - 80	0.03 - 0.1
		Toughness	AH725	20 - 80	0.03 - 0.1
	Superalloys (Inconel718, etc.)	First choice	SH725	20 - 80	0.03 - 0.1
		Toughness	AH725	20 - 80	0.03 - 0.1

TCT18R/L (for threading / lightly honed edge) / TCT18FR (for threading / sharp edge)

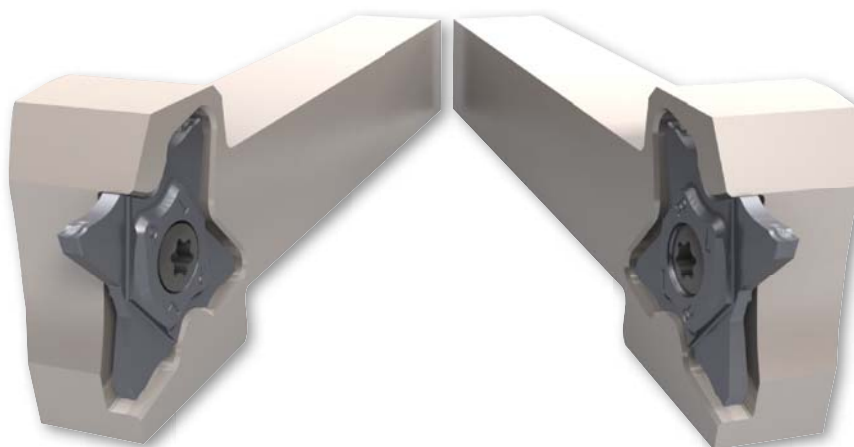
ISO	Workpiece materials	Priority	Grades	Cutting speed Vc (m/min)	Pitch (mm)	TPI
P	Low carbon steel (S15C / C15, S20C / C20, etc.)	First choice	SH725	60 - 150	0.4 - 2.0	64 - 18
		Toughness	AH725	60 - 150	0.8 - 3.0	32 - 8
	Carbon steels, Alloy steel (S55C / C55, SCM440 / 42CrMoS4, etc.)	First choice	SH725	60 - 150	0.4 - 2.0	64 - 18
		Toughness	AH725	60 - 150	0.8 - 3.0	32 - 8
	Prehardened steel (NAK80, PX5, etc.)	First choice	SH725	60 - 150	0.4 - 2.0	64 - 18
		Toughness	AH725	60 - 150	0.8 - 3.0	32 - 8
M	Stainless steel (SUS304 / X5CrNi18-9, X5CrNiMo17-12-2, etc.)	First choice	SH725	50 - 80	0.4 - 2.0	64 - 18
		Toughness	AH725	50 - 80	0.8 - 3.0	32 - 8
	Grey cast iron (FC250 / GG25 / 250, FC300 / GG30 / 300, etc.)	First choice	AH725	50 - 100	0.8 - 3.0	32 - 8
		Sharpness	SH725	50 - 100	0.4 - 2.0	64 - 18
K	Ductile cast iron (FCD400 / 400-15, FCD600 / 600-3, etc.)	First choice	AH725	50 - 100	0.8 - 3.0	32 - 8
		Sharpness	SH725	50 - 100	0.4 - 2.0	64 - 18
	Titanium alloys (Ti-6Al-4V, etc.)	First choice	SH725	30 - 100	0.4 - 2.0	64 - 18
		Toughness	AH725	30 - 100	0.8 - 3.0	32 - 8
S	Superalloys (Inconel718, etc.)	First choice	SH725	30 - 100	0.4 - 2.0	64 - 18
		Toughness	AH725	30 - 100	0.8 - 3.0	32 - 8

INNOVATIVE INSERTS

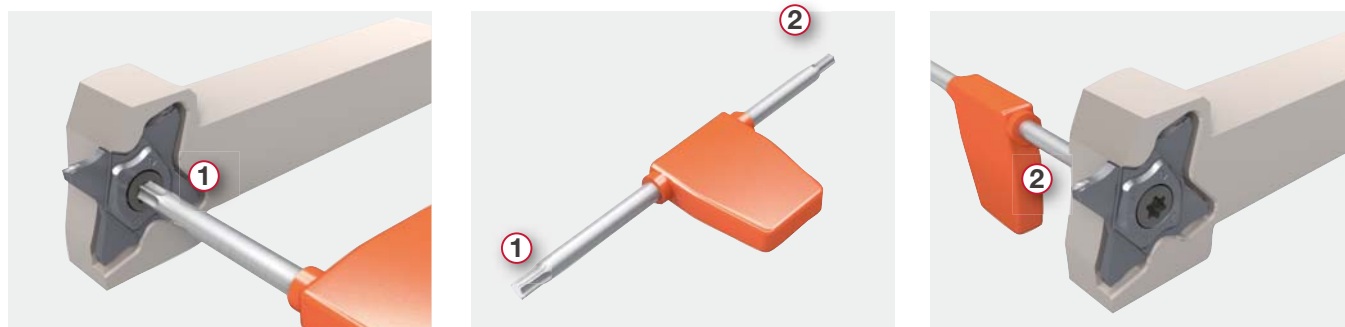
- Suitable for precision grooving or parting-off in general machining including small parts
- Two types of chipbreakers available for TC*27 inserts



One insert fits right-hand or left-hand holders



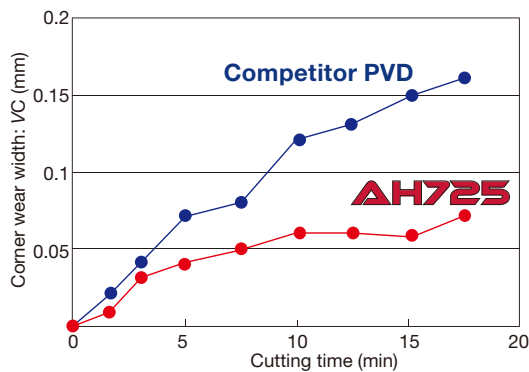
Insert can be clamped either from front or back side of the holder



CUTTING PERFORMANCE

Tool life

P Alloy steel



Toolholder : STCR2525-27
 Insert : TCS27-200-020 AH725
 Workpiece material : SCM440 / 42CrMo4
 Cutting speed : $V_c = 150$ m/min
 Feed : $f = 0.06$ mm/rev
 Groove width : $W = 2$ mm
 Groove depth : $a_r = 3$ mm
 Coolant : Wet
 Comparison of corner wear width after 18 min machining

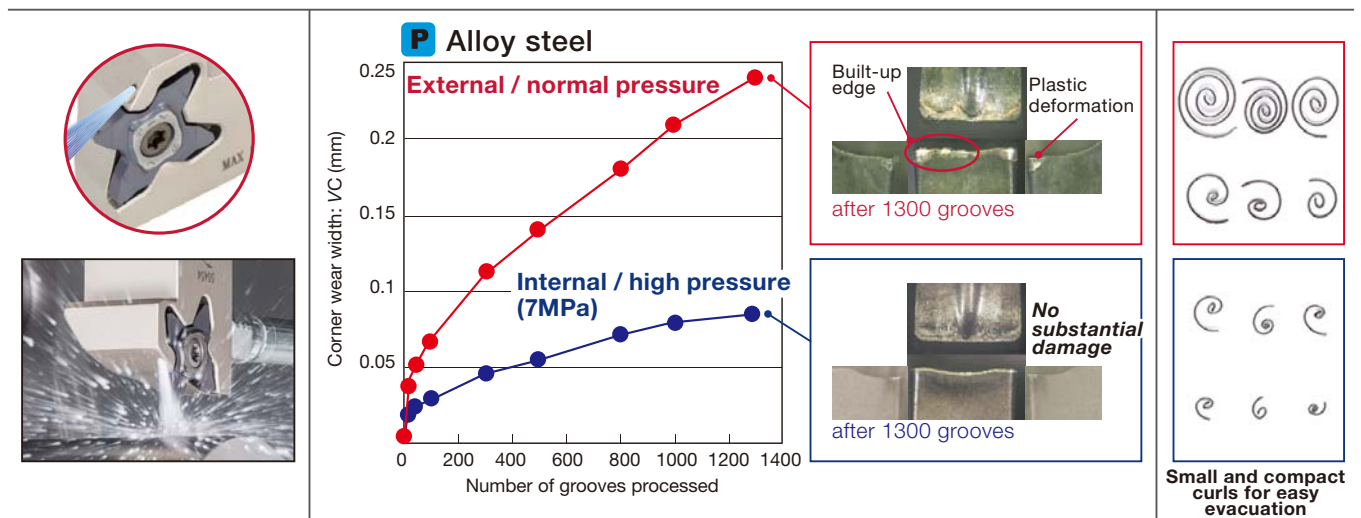
Benefits of using high pressure coolant

Coolant pressure comparison

Toolholder : STCR2525-27-CHP
 Insert : TCS27-200-020 AH725
 Workpiece material : SCM440 / 42CrMo4
 Cutting speed : $V_c = 180$ m/min
 Feed : $f = 0.12$ mm/rev
 Groove width : $W = 2$ mm
 Groove depth : $a_r = 5$ mm

Tool life

Chip form

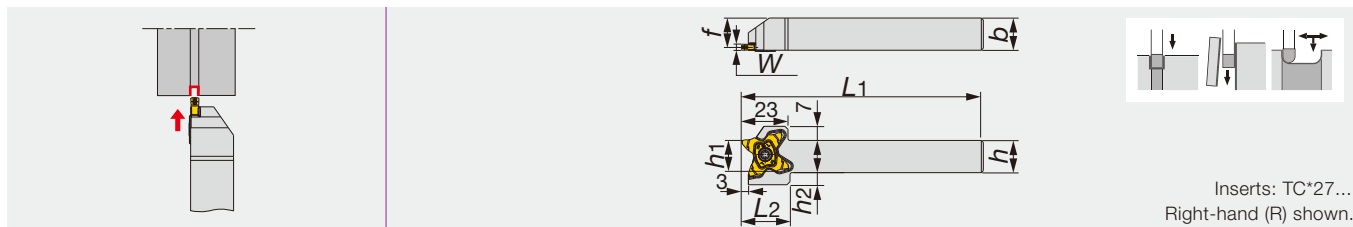


Always use internally-supplied high pressure coolant for a maximum tool performance

Precision grooving tools with uniquely shaped insert with 4 cutting edges

TOOLHOLDERS - FOR EXTERNAL GROOVING

TetraForce-Cut STCR/L



Designation	W	h1	b	h	L1	f	h2	L2
STCR/L1010-27	0.5 - 3.18	10	10	10	120	8.5	9.5	24
STCR/L1212-27	0.5 - 3.18	12	12	12	120	10.5	8	24
STCR/L1616-27	0.5 - 3.18	16	16	16	120	14.5	6	24
STCR/L2020-27	0.5 - 3.18	20	20	20	120	18.5	2	24
STCR/L2525-27	0.5 - 3.18	25	25	25	135	23.5	-	-

SPARE PARTS

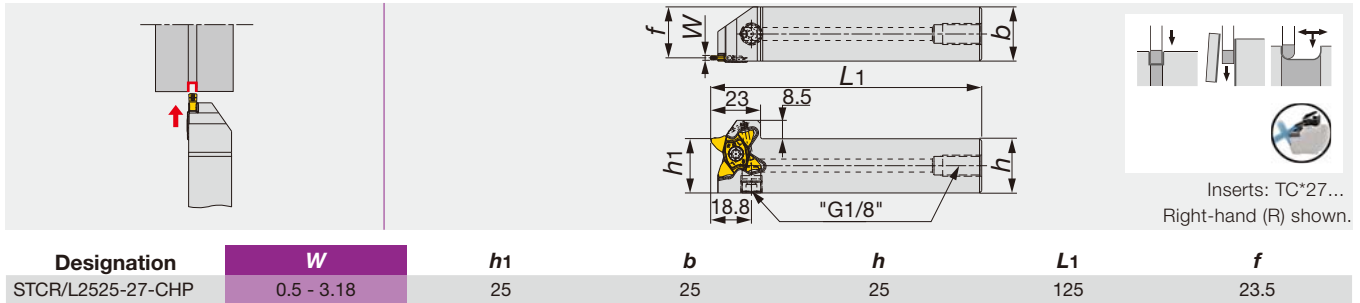


Designation	Screw	Wrench
STCR....-27	SR16-212-01397L	T-2010/5
STCL....-27	SR16-212-01397	T-2010/5

Precision grooving tools with uniquely shaped insert with 4 cutting edges and channel for high pressure coolant supply

TOOLHOLDERS - FOR EXTERNAL GROOVING

TetraForce-Cut STCR/L-CHP



SPARE PARTS

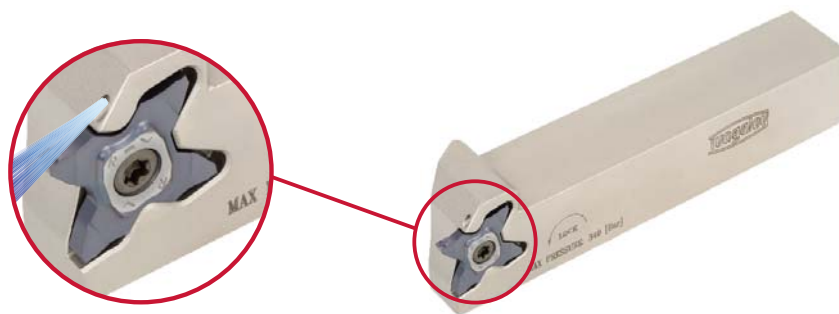


Designation	Screw	Wrench
STCR...-27-CHP	SR16-212-01397L	T-2010/5
STCL...-27-CHP	SR16-212-01397	T-2010/5

See page 15 for connections and coolant hoses.

CHP type toolholders for high-pressure coolant

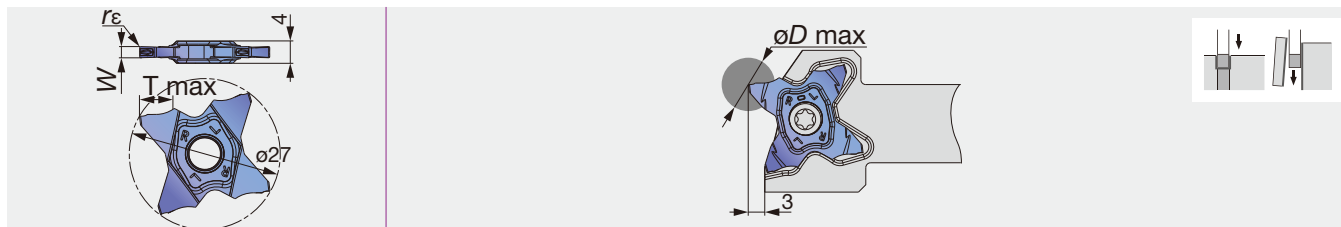
The coolant is supplied to the cutting edge providing good chip control and long tool life.



Precision grooving and parting-off insert with 4 cutting edges

INSERTS - FOR GROOVING AND PARTING-OFF

TetraForce-Cut TCS27



Designation	Grade AH725	W ± 0.02	rε	T max	øD max	Relation of groove depth (T) and Max. diameter (øD max)												
						T≤1.0	T≤2.0	T≤3.0	T≤3.5	T≤4.0	T≤4.5	T≤5.0	T≤5.5	T≤5.7	T≤6.0	T≤6.2	T≤6.4	
TCS27-050-000	●	0.5	0	1	2	∞	-	-	-	-	-	-	-	-	-	-	-	
TCS27-050-004	●	0.5	0.04	2.5	5	∞	∞	-	-	-	-	-	-	-	-	-	-	
TCS27-075-010	●	0.75	0.1	2.5	5	∞	∞	-	-	-	-	-	-	-	-	-	-	
TCS27-080-000	●	0.8	0	1.6	3.2	∞	-	-	-	-	-	-	-	-	-	-	-	
TCS27-100-006	●	1	0.06	3.5	7	∞	∞	∞	600	-	-	-	-	-	-	-	-	
TCS27-100-010	●	1	0.1	3.5	7	∞	∞	∞	600	-	-	-	-	-	-	-	-	
TCS27-104-000	●	1.04	0	2	4	∞	∞	-	-	-	-	-	-	-	-	-	-	
TCS27-120-000	●	1.2	0	2	4	∞	∞	-	-	-	-	-	-	-	-	-	-	
TCS27-125-010	●	1.25	0.1	3.5	7	∞	∞	∞	600	-	-	-	-	-	-	-	-	
TCS27-125-020	●	1.25	0.2	3.5	7	∞	∞	∞	600	-	-	-	-	-	-	-	-	
TCS27-140-000	●	1.4	0	2	4	∞	∞	-	-	-	-	-	-	-	-	-	-	
TCS27-147-000	●	1.47	0	2.5	5	∞	∞	-	-	-	-	-	-	-	-	-	-	
TCS27-150-010	●	1.5	0.1	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCS27-150-020	●	1.5	0.2	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCS27-157-015	●	1.57	0.15	3	6	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-170-010	●	1.7	0.1	3	6	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-175-010	●	1.75	0.1	3	6	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-175-020	●	1.75	0.2	3	6	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-178-018	●	1.78	0.18	3	6	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-185-020	●	1.85	0.2	3	6	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-196-015	●	1.96	0.15	3	6	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-200-010	●	2	0.1	6.4	12.8	∞	∞	∞	600	280	180	130	105	85	60	50	30	
TCS27-200-020	●	2	0.2	6.4	12.8	∞	∞	∞	600	280	180	130	105	85	60	50	30	
TCS27-222-015	●	2.22	0.15	3.5	7	∞	∞	∞	600	-	-	-	-	-	-	-	-	
TCS27-230-020	●	2.3	0.2	3.5	7	∞	∞	∞	600	-	-	-	-	-	-	-	-	
TCS27-239-015	●	2.39	0.15	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCS27-247-020	●	2.47	0.2	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCS27-250-010	●	2.5	0.1	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCS27-250-030	●	2.5	0.3	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCS27-270-010	●	2.7	0.1	6.2	12.4	∞	∞	∞	600	280	180	135	105	95	85	78	-	
TCS27-287-020	●	2.87	0.2	6.2	12.4	∞	∞	∞	600	280	180	135	105	95	85	78	-	
TCS27-300-000	●	3	0	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55	
TCS27-300-020	●	3	0.2	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55	
TCS27-300-030	●	3	0.3	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55	
TCS27-300-040	●	3	0.4	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55	
TCS27-315-015	●	3.15	0.15	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	68	
TCS27-318-020	●	3.18	0.2	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	68	

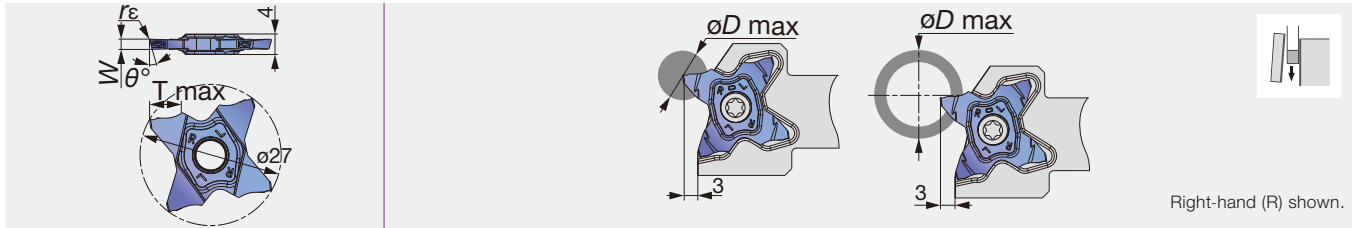
Package Quantity = 5 pcs.

● : Line up

Precision parting-off insert with 4 cutting edges (With frontal lead angle)

INSERTS - FOR PARTING-OFF

TetraForce-Cut TCS27-R/L



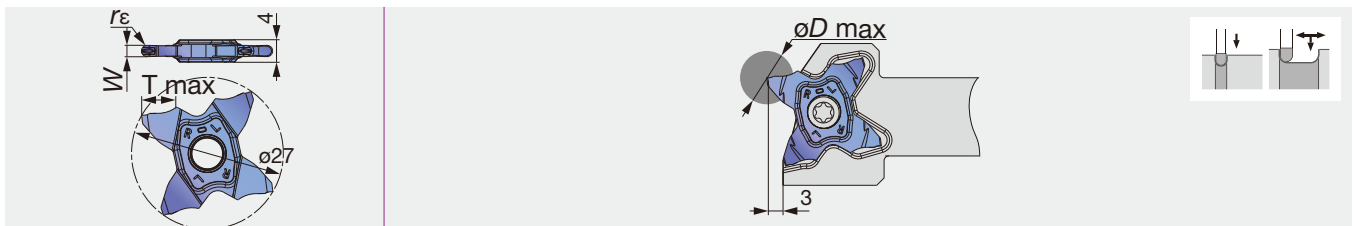
Designation	Grade AH725		$W \pm 0.02$	r_ϵ	T max	θ°	Max. parting-off dia. $\phi D \max$	
	R	L					Solid bar	Tube
TCS27-100-15R/L	●	●	1	0.06	3.5	15	7	600
TCS27-150-6R/L	●	●	1.5	0.06	5.7	6	11.4	35
TCS27-150-15R/L	●	●	1.5	0.06	5.7	15	11.4	35
TCS27-200-6R/L	●	●	2	0.10	6.4	6	12.8	30
TCS27-200-15R/L	●	●	2	0.10	6.4	15	12.8	30

Package Quantity = 5 pcs.
● : Line up

Precision grooving insert with 4 cutting edges (With full radius)

INSERTS - FOR GROOVING AND PROFILING

TetraForce-Cut TCS27-Full R



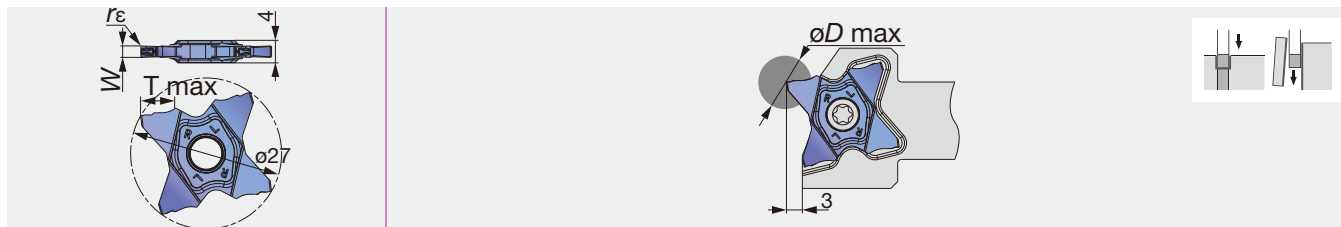
Designation	Grade AH725	$W \pm 0.02$	r_ϵ	T max	Relation of groove depth (T) and Max. diameter ($\phi D \max$)												
					T≤1.0	T≤2.0	T≤3.0	T≤3.5	T≤4.0	T≤4.5	T≤5.0	T≤5.5	T≤5.7	T≤6.0	T≤6.2	T≤6.4	
TCS27-157-079	●	1.57	0.79	3	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-200-100	●	2	1	3	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCS27-239-120	●	2.39	1.2	5.7	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCS27-300-150	●	3	1.5	6.4	∞	∞	∞	600	280	180	135	105	95	85	78	55	

Package Quantity = 5 pcs.
● : Line up

Grooving and parting-off insert with 4 cutting edges

INSERTS - FOR GROOVING AND PARTING-OFF

TetraForce-Cut TCM27



Designation	Grade AH725	W ± 0.02	rε	T max	øD max	Relation of groove depth (T) and Max. diameter (øD max)												
						T≤1.0	T≤2.0	T≤3.0	T≤3.5	T≤4.0	T≤4.5	T≤5.0	T≤5.5	T≤5.7	T≤6.0	T≤6.2	T≤6.4	
TCM27-150-010	●	1.5	0.1	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCM27-150-020	●	1.5	0.2	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCM27-157-015	●	1.57	0.15	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-170-010	●	1.7	0.1	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-175-010	●	1.75	0.1	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-175-020	●	1.75	0.2	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-178-018	●	1.78	0.18	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-185-020	●	1.85	0.2	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-196-015	●	1.96	0.15	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-200-010	●	2	0.1	6.4	12.8	∞	∞	∞	600	280	180	130	105	85	60	50	30	
TCM27-200-020	●	2	0.2	6.4	12.8	∞	∞	∞	600	280	180	130	105	85	60	50	30	
TCM27-222-015	●	2.22	0.15	3.5	7.0	∞	∞	∞	600	-	-	-	-	-	-	-	-	
TCM27-230-020	●	2.3	0.2	3.5	7.0	∞	∞	∞	600	-	-	-	-	-	-	-	-	
TCM27-239-015	●	2.39	0.15	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCM27-247-020	●	2.47	0.2	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCM27-250-010	●	2.5	0.1	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCM27-250-030	●	2.5	0.3	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCM27-270-010	●	2.7	0.1	6.2	12.4	∞	∞	∞	600	280	180	135	105	95	85	78	-	
TCM27-287-020	●	2.87	0.2	6.2	12.4	∞	∞	∞	600	280	180	135	105	95	85	78	-	
TCM27-300-000	●	3	0	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55	
TCM27-300-020	●	3	0.2	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55	
TCM27-300-030	●	3	0.3	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55	
TCM27-300-040	●	3	0.4	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55	
TCM27-315-015	●	3.15	0.15	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	68	
TCM27-318-020	●	3.18	0.2	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	68	

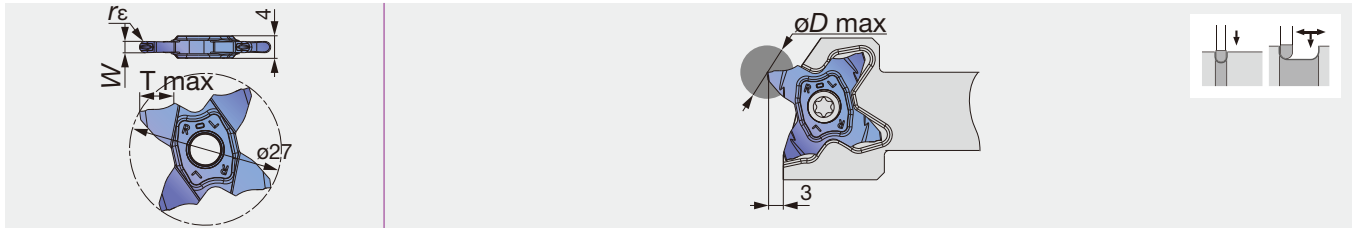
Package Quantity = 5 pcs.

● : Line up

Grooving and profiling insert with 4 cutting edges

INSERTS - FOR GROOVING AND PROFILING

TetraForce-Cut TCM27-Full R

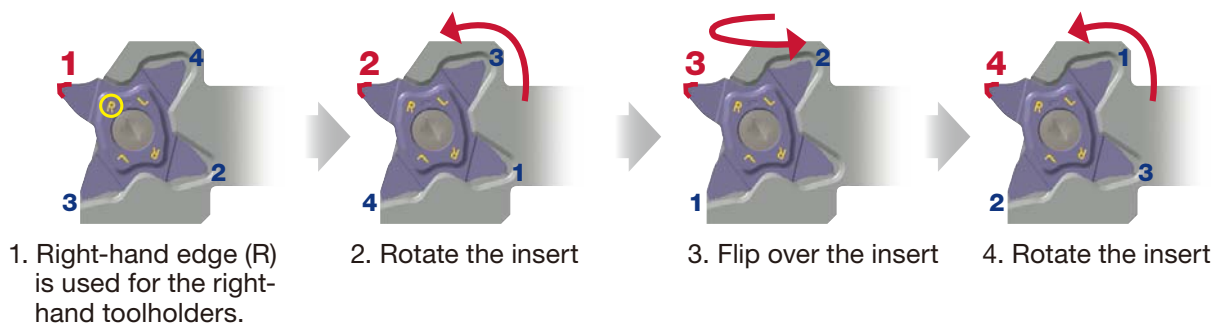


Designation	Grade AH725	W ± 0.02	rε	T max	Relation of groove depth (T) and Max. diameter (øD max)											
					T≤1.0	T≤2.0	T≤3.0	T≤3.5	T≤4.0	T≤4.5	T≤5.0	T≤5.5	T≤5.7	T≤6.0	T≤6.2	T≤6.4
TCM27-157-079	●	1.57	0.79	3	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCM27-200-100	●	2	1	3	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCM27-239-120	●	2.39	1.2	5.7	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCM27-300-150	●	3	1.5	6.4	∞	∞	∞	600	280	180	135	105	95	85	78	55

Package Quantity = 5 pcs.

● : Line up

HOW TO INDEX INSERTS

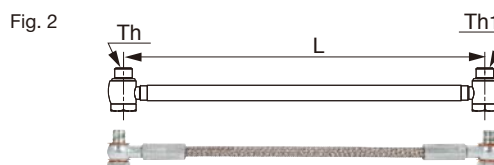
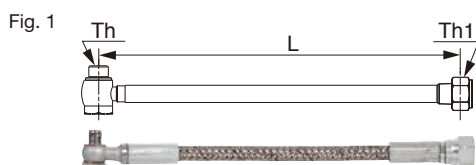


STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Grades	Cutting speed Vc (m/min)	Feed: f (mm/rev)					Depth of cut for profiling (with full radius insert)
				Grooving, parting-off		Parting-off (with hand)	Profiling (with full radius insert)		
				TCS	TCM	TCS	TCS	TCM	
	Carbon steel (S45C / C45, etc.)	AH725	100 - 200	0.05 - 0.15	0.05 - 0.25	0.04 - 0.12	0.05 - 0.10	0.05 - 0.15	0.5
	Alloy steel (SCM435 / 34CrMo4, etc.)	AH725	50 -180	0.05 - 0.15	0.05 - 0.25	0.04 - 0.12	0.05 - 0.10	0.05 - 0.15	0.5
	Stainless steel (SUS304 / X5CrNi18-9, etc.)	AH725	100 - 150	0.05 - 0.15	0.05 - 0.20	0.04 - 0.12	0.05 - 0.10	0.05 - 0.15	0.5
	Grey cast iron (FC250 / 250 / GG25, etc.)	AH725	50 - 180	0.05 - 0.15	0.05 - 0.25	0.04 - 0.12	0.05 - 0.10	0.05 - 0.15	0.5
	Ductile cast iron (FCD400 / 400-15 / GGG400, etc.)	AH725	50 - 120	0.05 - 0.15	0.05 - 0.20	0.04 - 0.12	0.05 - 0.10	0.05 - 0.15	0.5
	Titanium alloys (Ti-6Al-4V, etc.)	AH725	30 - 60	0.05 - 0.15	0.05 - 0.15	0.04 - 0.12	0.05 - 0.10	0.05 - 0.10	0.5

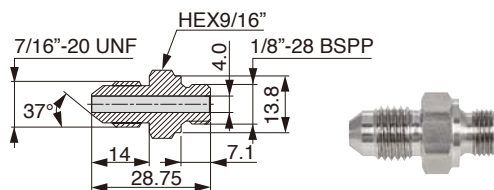
PARTS FOR COOLANT HOSE

Connecting hose



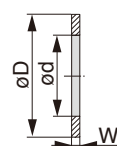
Designation	Length L	Threading size		Max. pressure (MPa)	Fig.
		Th	Th1		
CHP-HOSE-G1/8-7/16-200BS	200	G1/8"-28 BSPP	7/16"-20 UNF	26	1
CHP-HOSE-G1/8-7/16-250BS	250	G1/8"-28 BSPP	7/16"-20 UNF	26	1
CHP-HOSE-G1/8-G1/8-200BB	200	G1/8"-28 BSPP	G1/8"-28 BSPP	26	2
CHP-HOSE-G1/8-G1/8-250BB	250	G1/8"-28 BSPP	G1/8"-28 BSPP	26	2

Connector



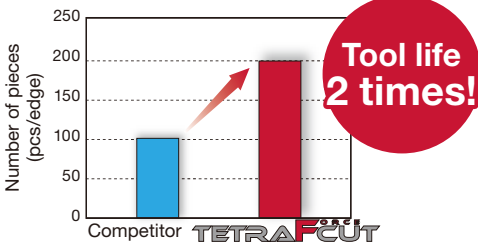
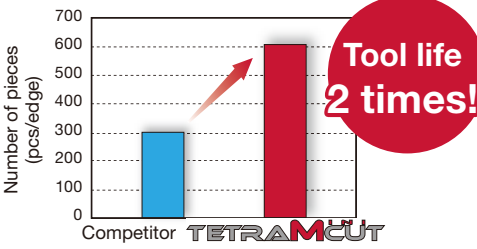
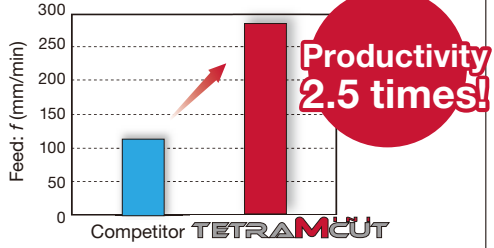
Designation
CHP-NIPPLE-G1/8-7/16UNF

Seal washer



Designation	øD	ød	W
CHP-COPPER-SEAL1/8	15	10	1

PRACTICAL EXAMPLES

Workpiece type		Shaft stator	Input shaft
Toolholder		STCR2525-27	STCR2525Z18
Insert		TCS27-200-020	TCG18R150-020
Grade		AH725	AH7025
Workpiece material		S45C / C45	SCr420 / 20Cr4
Cutting conditions	Cutting speed: V_c (m/min)	210	100
	Feed: f (mm/rev)	0.15	0.08
	Groove depth: a_r (mm)	2	2.1
	Groove width: w (mm)	2	2
	Machining	External grooving	External grooving
	Coolant	Wet	Wet
	Machine	NC lathe	NC lathe
Results		 Due to the incredible wear resistance, TetraForce-Cut doubles tool life compared to the competitor. TCS chipbreaker improves chip control in which the competitor's chipbreaker has problems.	 Thanks to its high wear resistance, AH7025 has successfully machined 600 parts and was still able to continue.
Workpiece type		Spool shaft	Shaft
Toolholder		STCR1010X18	STCR1212X18-CHP
Insert		TCP18R200F-010	TCP18R200F-010
Grade		SH725	SH725
Workpiece material		S45C / C45	S15C / C15E4
Cutting conditions	Cutting speed: V_c (m/min)	43	95
	Feed: f (mm/rev)	0.10	0.03
	Groove depth: a_r (mm)	1.5 / 1.1	1
	Groove width: w (mm)	2 / 2.5	2.5
	Machining	External grooving	External grooving
	Coolant	Wet	Wet
	Machine	Swiss lathe	Swiss lathe
Results		 Due to the rigid clamping, TetraMini-Cut provides higher feed than the competitor, achieving 2.5 times better productivity.	 Thanks to its high pressure coolant jet system, TugnTurn-Jet has improved the chip evacuation, eliminating the post-work chip cleaning process.

Expedited delivery service for special grooving insert

Expedited delivery service for special grooving inserts is rendered under the following lead time and quantity terms. Please note that this service is applicable only for the order for an initial test batch; a repeat order is to be placed through the regular ordering process.

ORDER
3 - 15 pcs.



LEAD TIME
from the point of order receipt
(excluding transportation)

COATED INSERT
4 weeks

NON-COATED INSERT
3 weeks



DELIVERY



TETRAM^{IN}CUT
TUNGALOY

Special width
& corner radii



With chamfer
edges



Grade

Coated carbide

AH725

SH725

TCP18
R/L



TETRA^{FORCE}CUT
TUNGALOY

Special width
& corner radii



With chamfer edges



Grade

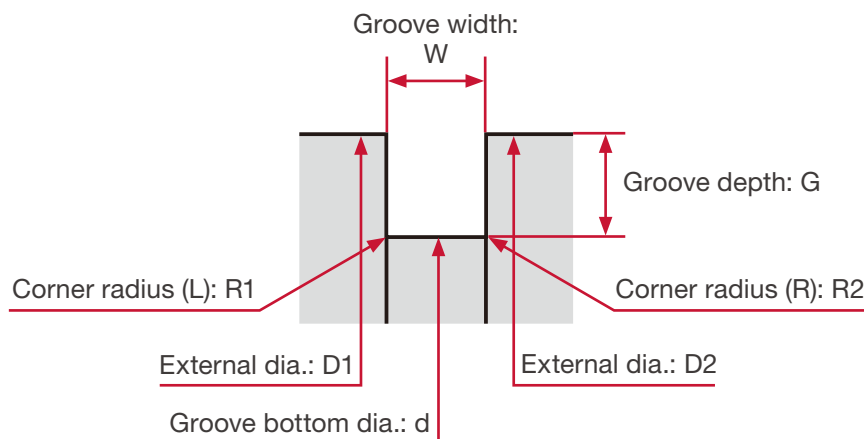
Coated carbide

AH725

TCG27



Special width & corner radii



TETRAMCUT
TUNGALOY

Groove width (W)	Max. groove depth (G)	Corner radii (R1 / R2)	Toolholder
0.33 ~ 0.49 mm	~ 1.0 mm	0	STCR/L****-18
0.50 ~ 0.74 mm	~ 2.0 mm	or 0.05 ~ W/2	
0.75 ~ 3.18 mm	~ 2.5 mm	(Full radius is available)	

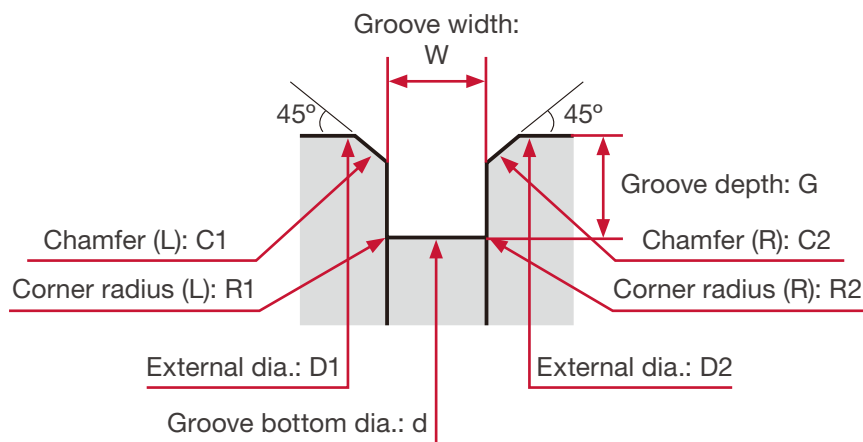
*Tolerances of the insert are based on the standard item.

TETRAFCUT
TUNGALOY

Groove width (W)	Max. groove depth (G)	Corner radii (R1 / R2)	Toolholder
0.33 ~ 0.49 mm	~ 1.0 mm	0 or 0.05 ~ W/2 (Full radius is available)	STCR/L****-27
0.50 ~ 0.99 mm	~ 2.5 mm		
1.0 ~ 1.49 mm	~ 3.5 mm		
1.50 ~ 1.99 mm	~ 5.7 mm		
2.00 ~ 3.18 mm	~ 6.4 mm		

*Tolerances of the insert are based on the standard item.

Grooving & chamfering



TETRAMCUT
TUNGALOY

Groove width + chamfer width (W+2C)	Max. groove depth (G)	Corner radii (R1 / R2)	Toolholder
0.5 ~ 3.5 mm	0.50 ~ 2.00 mm	0 or 0.05 ~ W/2 (Full radius is available)	STCR/L****-18

*Tolerances of the insert are based on the standard item.

Max. width of chamfer is 0.5 mm.

Some combinations of a groove width, depth, a corner radius(R), and chamfer may be unable to be manufactured.

TETRAFCUT
TUNGALOY

Groove width + chamfer width (W+2C)	Max. groove depth (G)	Corner radii (R1 / R2)	Toolholder
0.5 ~ 3 mm	0.50 ~ 3.00 mm	0 or 0.05 ~ W/2 (Full radius is available)	STCR/L****-27

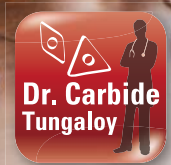
*Tolerances of the insert are based on the standard item.

Max. width of chamfer is 0.5 mm.

Some combinations of a groove width, depth, a corner radius(R), and chamfer may be unable to be manufactured.

100

Check our site and our App to get more info!



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