

GrooveLine

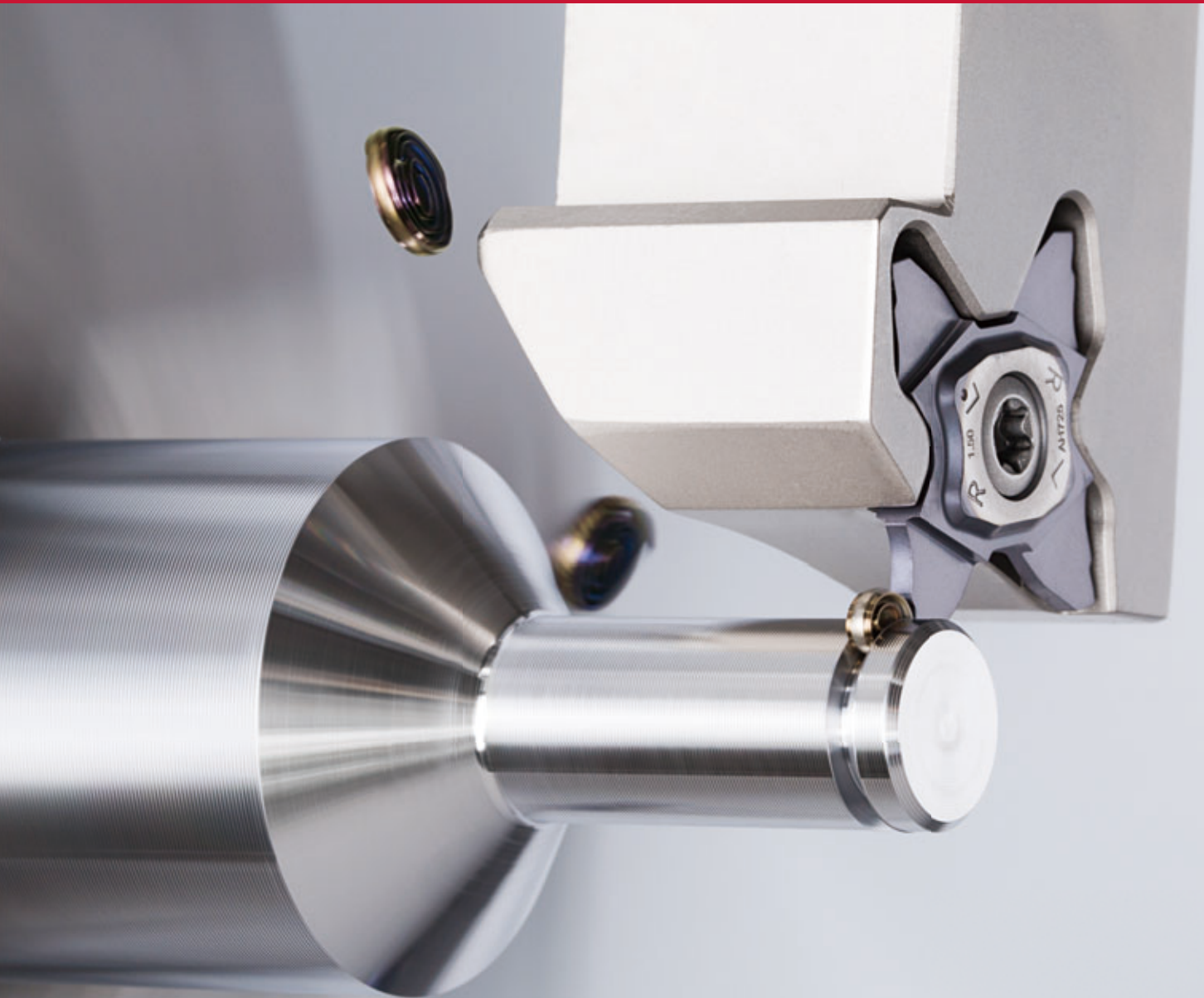
TETRAFORCE-CUT

www.tungaloy.com

Tungaloy Report No. 416-G

TETRAFORCE-CUT

Durable and economical tool for grooving and parting-off





ACCELERATED MACHINING

GrooveLine

TETRA^{FORCE}**FCUT**
TUNGALOY

TUNG^{FORCE}**ROOVE**
ACCELERATED MACHINING



TetraForce-Cut is an innovative solution for grooving. Ground insert clamps into uniquely designed pocket, providing high insert stability as well as repeatability.

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

High-precision ground insert in unique shape

- Same insert applicable for right- and left-hand toolholders (TC*27 type)
- Handed insert for small-part machining (TCP18 type)



TC*27 type

TETRAFORCE



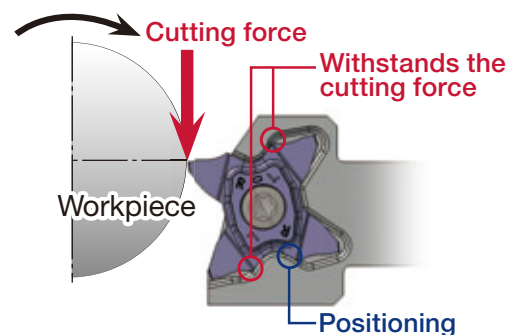
TCP18 type

TETRAMCUT

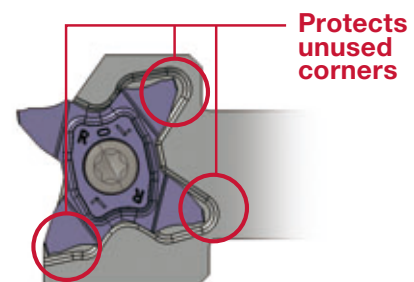
Unique 3-point clamping system provides high rigidity and repeatability

Highly rigid cutting edge allows:

- High accuracy in groove width
- Excellent surface finish
- Stable tool life without sudden chipping



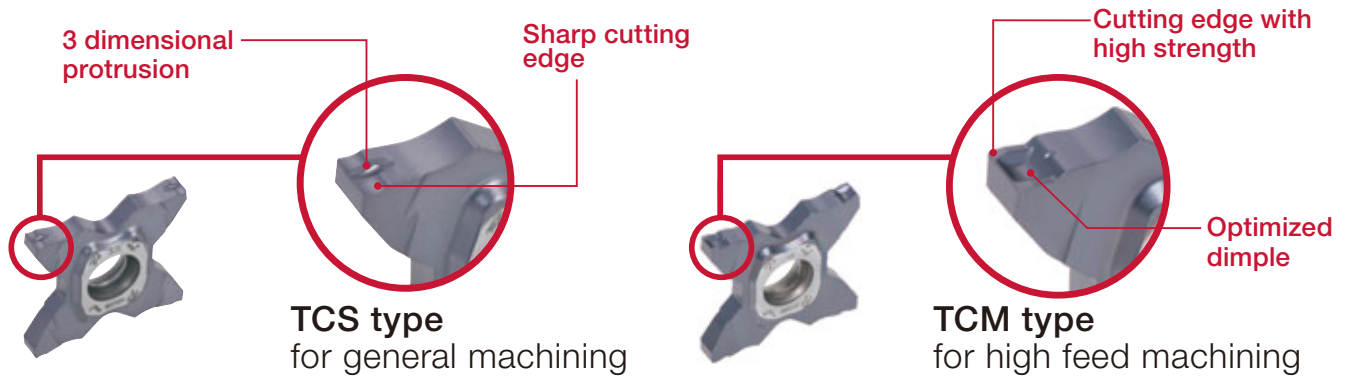
The insert pocket protects all unused cutting edges



Innovative inserts

TETRA^{FORCE}CUT

- Suitable for precise grooving and parting-off in general or small lathes
- 2 types of chipbreakers available for TC*27 inserts



TETRA^MCUT

- Suitable for grooving application for small parts on swiss lathe

- Sharp cutting edge and hard layer in SH725 grade provides stable machining in small-part machining.

- AH725 grade insert has honed edge with high toughness

- TCT type insert is suitable for various threading with 60° thread angle.

- Toolholder with optimum design for machining next to the shoulder without interference

Low cutting force with large rake angle



Low cutting force with sharp cutting edge



CHP type toolholders for high-pressure coolant

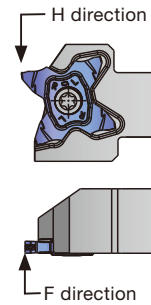
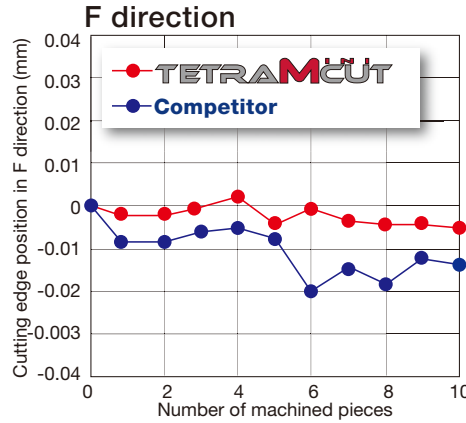
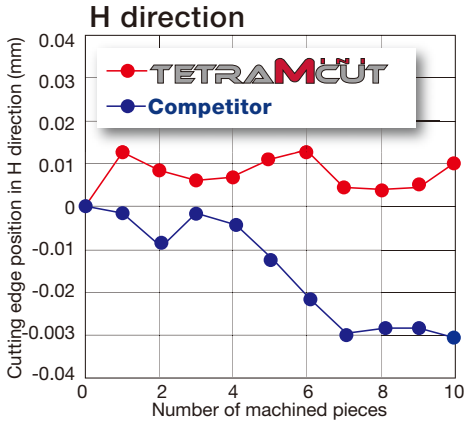
The coolant directly supplied to the cutting edge provides good chip control and long tool life.



CUTTING PERFORMANCE

Tool rigidity

TETRAMCUT



Process: Measure #1 → machining → Measure #2

Displacement of cutting edge position: Difference between Measure #1 & #2

Toolholder : STCR1212X18
 Insert : TCP18R200F-010 SH725
 Workpiece material : S45C / C45 (170HB)
 Cutting speed : $V_c = 150$ m/min
 Feed : $f = 0.08$ mm/rev
 Groove width : $W = 2.0$ mm
 Groove depth : $ar = 2.5$ mm
 Coolant : Wet
 Machining : Grooving
 Machine : Swiss lathe

Chip control

TETRAFORCE CUT

M Stainless steel

Cutting speed: V_c (m/min)	130					
	80					
		0.05	0.1	0.15	0.2	0.25
Feed: f (mm/rec)						

Toolholder : STCR2525-27
 Insert : TCM27-200-020 AH725
 Workpiece material : SUS303 / X10CrNiS18-9
 Groove width : $W = 2$ mm

TETRAMCUT

M Stainless steel

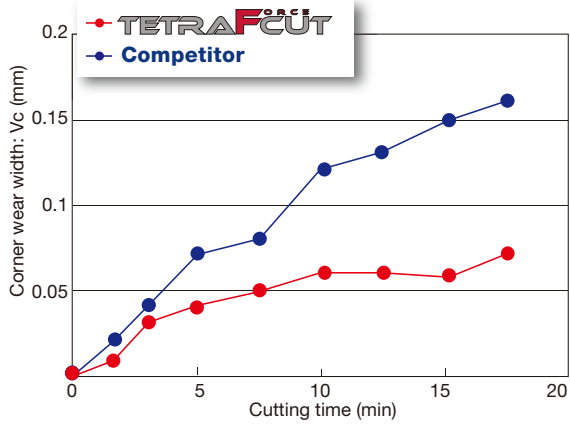
Cutting speed: V_c (m/min)	120						
	80						
		0.03	0.05	0.07	0.03	0.05	0.07
Feed: f (mm/rec)							

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

Tool life

TETRAFCUT

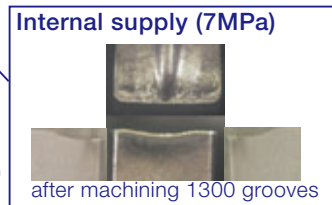
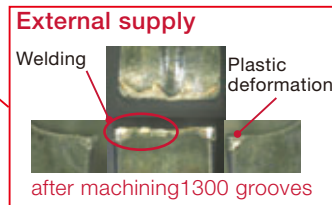
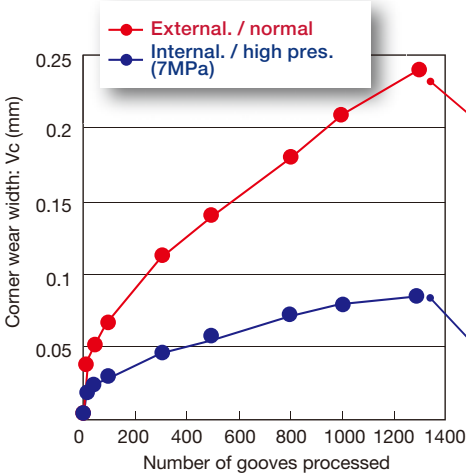
P Alloy steel



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 : $ar = 3$ mm
 Coolant : Wet

Comparison of corner wear width after 18 min machining

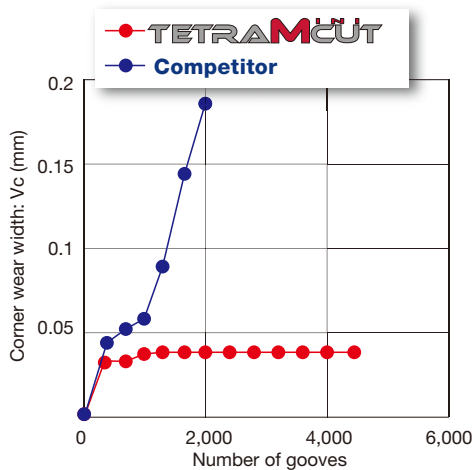
P Carbon steel (Machining with high pressure coolant)



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 : $ar = 5$ mm

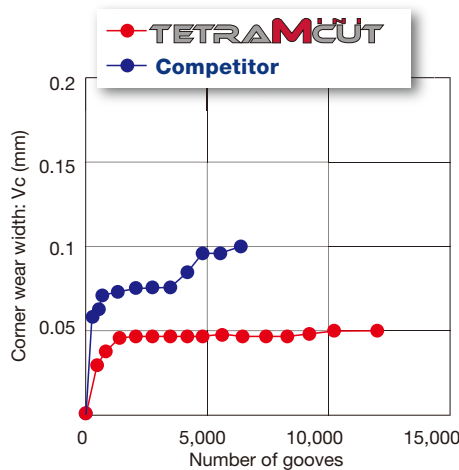
TETRAMCUT

P Carbon steel



Workpiece material : S45C / C45
 Cutting speed : $V_c = 150$ m/min
 Feed : $f = 0.05$ mm/rev
 Groove depth : $ar = 2.5$ mm

M Stainless steel



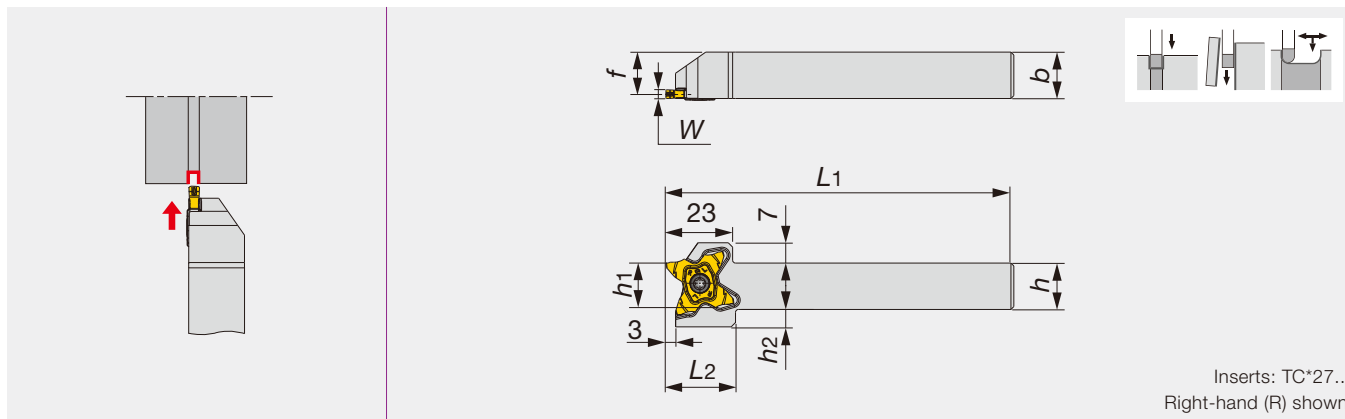
Workpiece material : SUS304 / X5CrNi18-9
 Cutting speed : $V_c = 120$ m/min
 Feed : $f = 0.05$ mm/rev
 Groove depth : $ar = 2.5$ mm

Toolholder : STCR1010X18
 Insert : TCP18R200F-010 AH725
 Groove width : $W = 2$ mm
 Coolant : Wet

Precision grooving tools with uniquely shaped insert containing 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

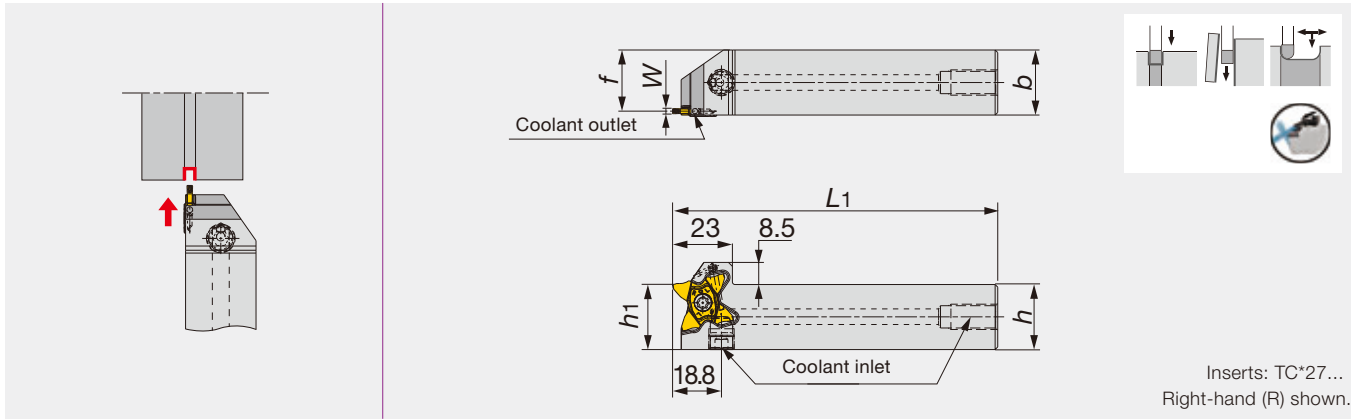


Designation	Screw	Wrench
STCR...-27	SR16-212-01397L	T-2010/5
STCL...-27	SR16-212-01397	T-2010/5

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

TOOLHOLDERS - FOR EXTERNAL GROOVING

TetraForce-Cut STCR/L-CHP



Designation	W	h1	b	h	L1	f
STCR/L2525-27-CHP	0.5 - 3.18	25	25	25	125	23.5

SPARE PARTS



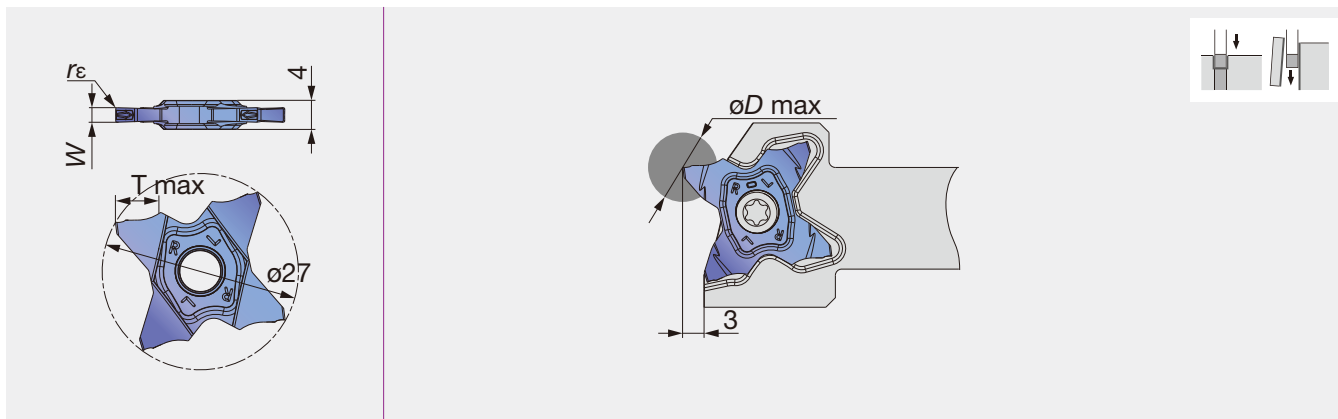
Designation	Screw	Wrench
STCR...-27-CHP	SR16-212-01397L	T-2010/5
STCL...-27-CHP	SR16-212-01397	T-2010/5

See page 15 for connections and coolant hoses.

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	●	0.50	0.00	1.0	2.0	∞	-	-	-	-	-	-	-	-	-	-	-
TCS27-050-004	●	0.50	0.04	2.5	5.0	∞	∞	-	-	-	-	-	-	-	-	-	-
TCS27-075-010	●	0.75	0.10	2.5	5.0	∞	∞	-	-	-	-	-	-	-	-	-	-
TCS27-080-000	●	0.80	0.00	1.6	3.2	∞	-	-	-	-	-	-	-	-	-	-	-
TCS27-100-006	●	1.00	0.06	3.5	7.0	∞	∞	∞	600	-	-	-	-	-	-	-	-
TCS27-100-010	●	1.00	0.10	3.5	7.0	∞	∞	∞	600	-	-	-	-	-	-	-	-
TCS27-104-000	●	1.04	0.00	2.0	4.0	∞	∞	-	-	-	-	-	-	-	-	-	-
TCS27-120-000	●	1.20	0.00	2.0	4.0	∞	∞	-	-	-	-	-	-	-	-	-	-
TCS27-125-010	●	1.25	0.10	3.5	7.0	∞	∞	∞	600	-	-	-	-	-	-	-	-
TCS27-125-020	●	1.25	0.20	3.5	7.0	∞	∞	∞	600	-	-	-	-	-	-	-	-
TCS27-140-000	●	1.40	0.00	2.0	4.0	∞	∞	-	-	-	-	-	-	-	-	-	-
TCS27-147-000	●	1.47	0.00	2.5	5.0	∞	∞	-	-	-	-	-	-	-	-	-	-
TCS27-150-010	●	1.50	0.10	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCS27-150-020	●	1.50	0.20	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCS27-157-015	●	1.57	0.15	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-170-010	●	1.70	0.10	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-175-010	●	1.75	0.10	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-175-020	●	1.75	0.20	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-178-018	●	1.78	0.18	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-185-020	●	1.85	0.20	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-196-015	●	1.96	0.15	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-200-010	●	2.00	0.10	6.4	12.8	∞	∞	∞	600	280	180	130	105	85	60	50	30
TCS27-200-020	●	2.00	0.20	6.4	12.8	∞	∞	∞	600	280	180	130	105	85	60	50	30
TCS27-222-015	●	2.22	0.15	3.5	7.0	∞	∞	∞	600	-	-	-	-	-	-	-	-
TCS27-230-020	●	2.30	0.20	3.5	7.0	∞	∞	∞	600	-	-	-	-	-	-	-	-
TCS27-239-015	●	2.39	0.15	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCS27-247-020	●	2.47	0.20	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCS27-250-010	●	2.50	0.10	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCS27-250-030	●	2.50	0.30	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCS27-270-010	●	2.70	0.10	6.2	12.4	∞	∞	∞	600	280	180	135	105	95	85	78	-
TCS27-287-020	●	2.87	0.20	6.2	12.4	∞	∞	∞	600	280	180	135	105	95	85	78	-
TCS27-300-000	●	3.00	0.00	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55
TCS27-300-020	●	3.00	0.20	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55
TCS27-300-030	●	3.00	0.30	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55
TCS27-300-040	●	3.00	0.40	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	0.20	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	68

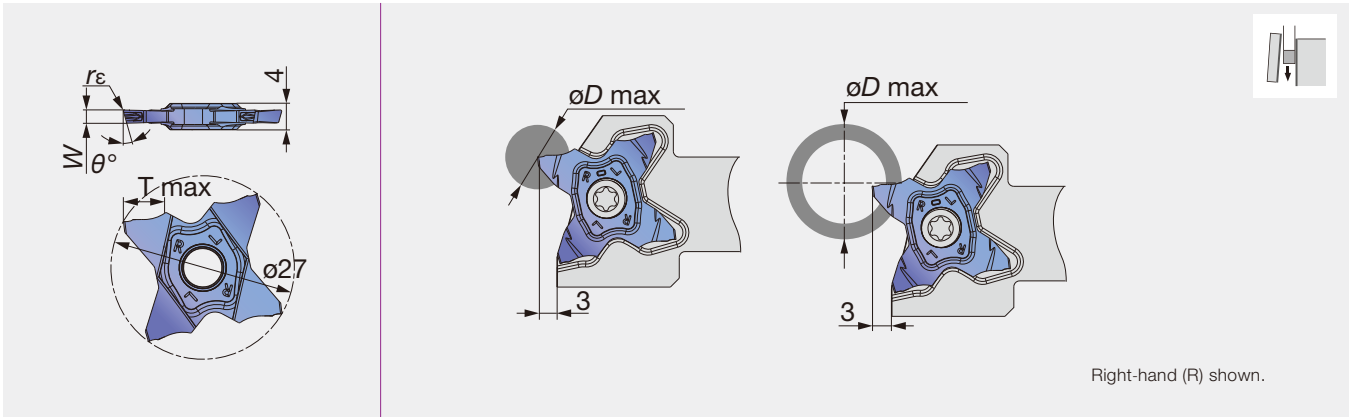
Package Quantity = 5 pcs.

● : Line-up

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

INSERTS - FOR PARTING-OFF

TetraForce-Cut TCS27-R/L



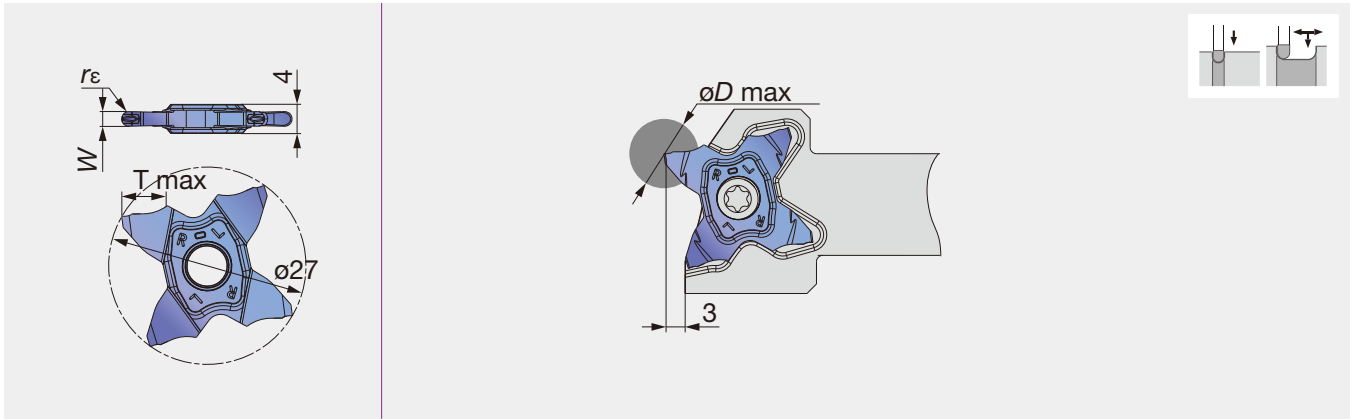
Designation	Grade		$W \pm 0.02$	r_ϵ	T max	θ°	Max. parting-off dia. ϕD_{max}	
	AH725						Solid bar	Tube
	R	L						
TCS27-100-15R/L	●	●	1.00	0.06	3.5	15	7	600
TCS27-150-6R/L	●	●	1.50	0.06	5.7	6	11.4	35
TCS27-150-15R/L	●	●	1.50	0.06	5.7	15	11.4	35
TCS27-200-6R/L	●	●	2.00	0.10	6.4	6	12.8	30
TCS27-200-15R/L	●	●	2.00	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



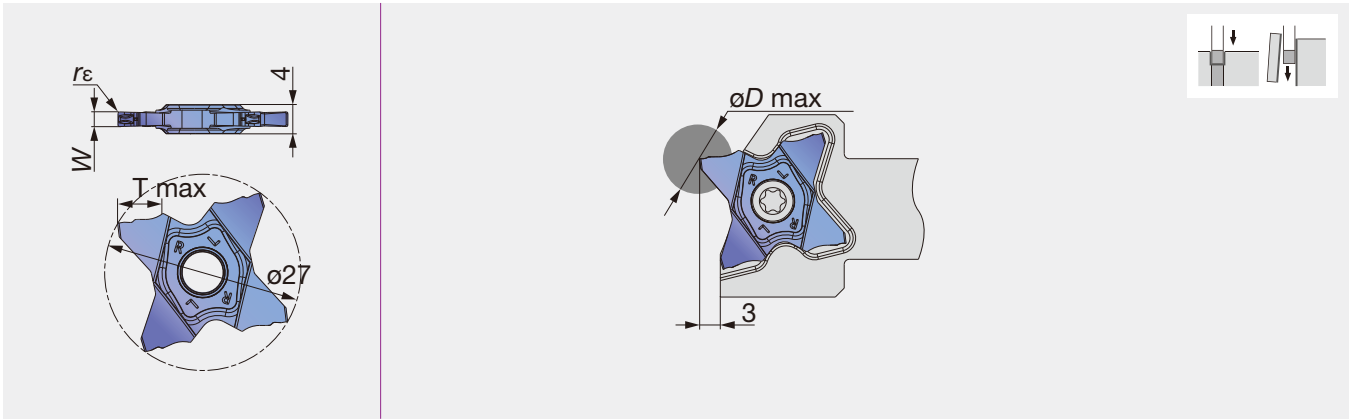
Designation	Grade AH725	W ± 0.02	rε	T max	Relation of groove depth (T) and Max. diameter (øD max)											
					T≤1.0	T≤2.0	T≤3.0	T≤3.5	T≤4.0	T≤4.5	T≤5.0	T≤5.5	T≤5.7	T≤6.0	T≤6.2	T≤6.4
TCS27-157-079	●	1.57	0.79	3.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-200-100	●	2.00	1.00	3.0	∞	∞	∞	-	-	-	-	-	-	-	-	-
TCS27-239-120	●	2.39	1.20	5.7	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCS27-300-150	●	3.00	1.50	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



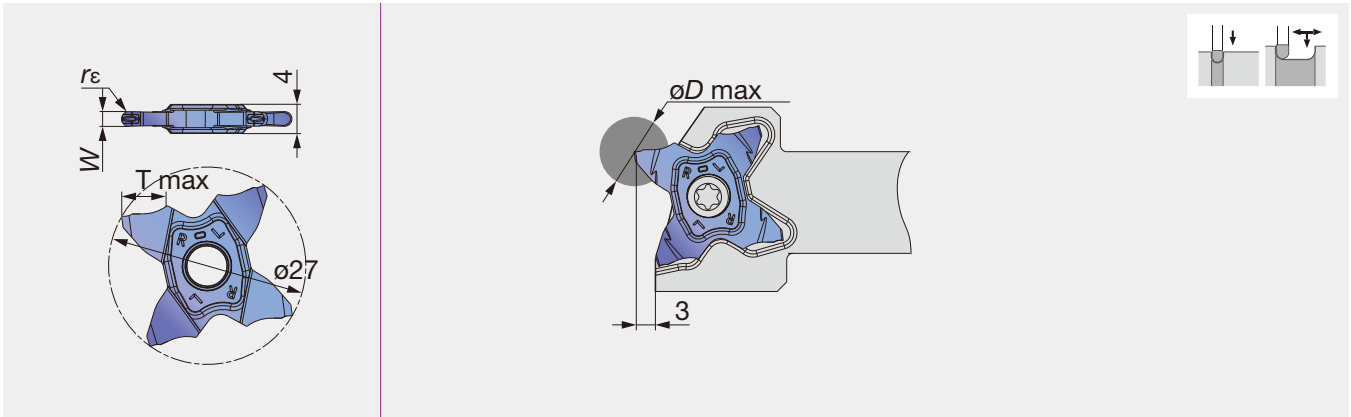
Designation	Grade AH725	W ± 0.02	r _e	T max	øD max	Relation of groove depth (T) and Max. diameter (øD max)											
						T≤1.0	T≤2.0	T≤3.0	T≤3.5	T≤4.0	T≤4.5	T≤5.0	T≤5.5	T≤5.7	T≤6.0	T≤6.2	T≤6.4
TCM27-150-010	●	1.50	0.10	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCM27-150-020	●	1.50	0.20	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCM27-157-015	●	1.57	0.15	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	
TCM27-170-010	●	1.70	0.10	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	
TCM27-175-010	●	1.75	0.10	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	
TCM27-175-020	●	1.75	0.20	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	
TCM27-178-018	●	1.78	0.18	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	
TCM27-185-020	●	1.85	0.20	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	
TCM27-196-015	●	1.96	0.15	3.0	6.0	∞	∞	∞	-	-	-	-	-	-	-	-	
TCM27-200-010	●	2.00	0.10	6.4	12.8	∞	∞	∞	600	280	180	130	105	85	60	50	30
TCM27-200-020	●	2.00	0.20	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	●	2.30	0.20	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	0.20	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCM27-250-010	●	2.50	0.10	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCM27-250-030	●	2.50	0.30	5.7	11.4	∞	∞	∞	600	280	180	130	50	35	-	-	-
TCM27-270-010	●	2.70	0.10	6.2	12.4	∞	∞	∞	600	280	180	135	105	95	85	78	-
TCM27-287-020	●	2.87	0.20	6.2	12.4	∞	∞	∞	600	280	180	135	105	95	85	78	-
TCM27-300-000	●	3.00	0.00	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55
TCM27-300-020	●	3.00	0.20	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55
TCM27-300-030	●	3.00	0.30	6.4	12.8	∞	∞	∞	600	280	180	135	105	95	85	78	55
TCM27-300-040	●	3.00	0.40	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	0.20	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

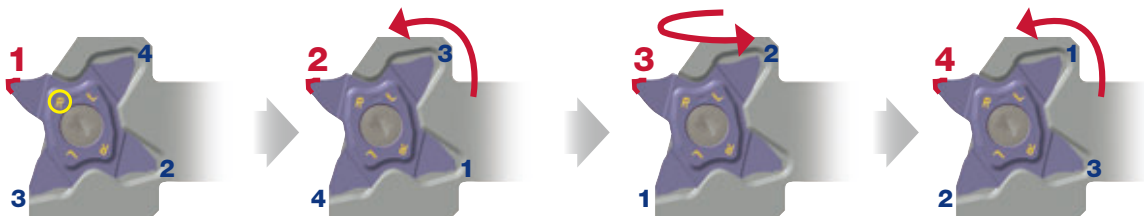
TetraForce-Cut TCM27-Full R



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	3.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-200-100	●	2.00	1.00	3.0	∞	∞	∞	-	-	-	-	-	-	-	-	-	
TCM27-239-120	●	2.39	1.20	5.7	∞	∞	∞	600	280	180	130	50	35	-	-	-	
TCM27-300-150	●	3.00	1.50	6.4	∞	∞	∞	600	280	180	135	105	95	85	78	55	

Package Quantity = 5 pcs.
● : Line-up

HOW TO INDEX INSERTS



1. Right-hand edge (R) is used for the right-hand toolholders.

2. Rotate the insert

3. Flip over the insert

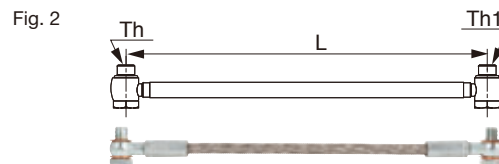
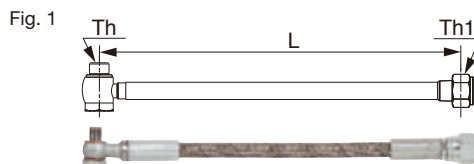
4. Rotate the insert

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Grades	Cutting speed V_c (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	
P	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
M	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
K	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
S	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

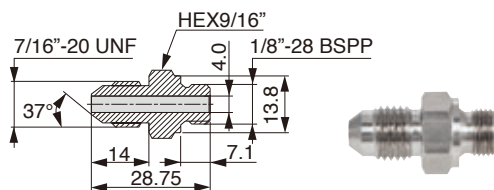
PARTS FOR COOLANT HOSE

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

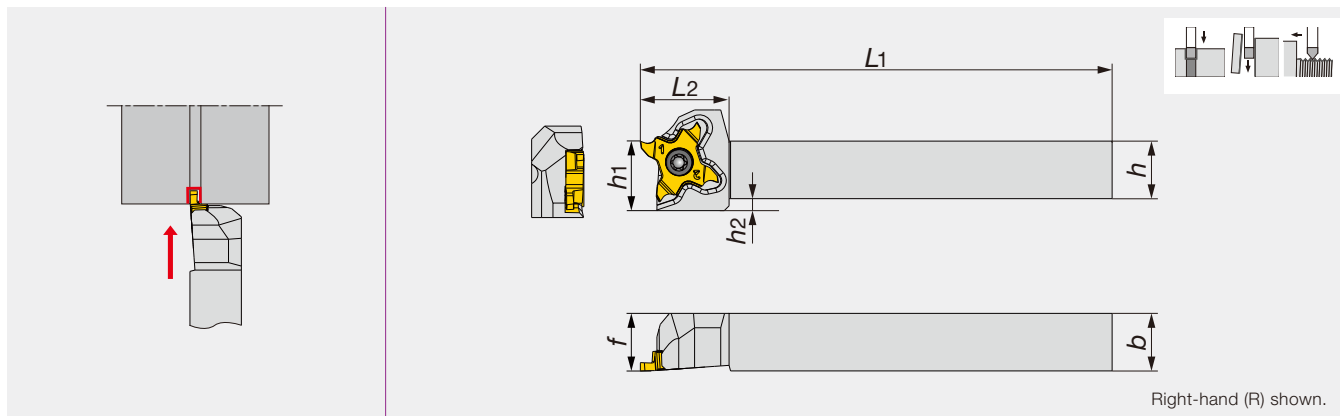


Designation	$\varnothing D$	$\varnothing d$	W
CHP-COPPER-SEAL1/8	15	10	1

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

TOOLHOLDER - FOR GROOVING AND THREADING

TetraMini-Cut / TetraMini-Thread STCR/L-18



Designation	<i>h</i>	<i>b</i>	<i>L1</i>	<i>L2</i>	<i>h1</i>	<i>f</i>	<i>h2</i>	Insert
STCR/L1010X18	10.0	10.0	120.0	18.5	10.0	10.0	4.5	TC*18...
STCR/L1212F18	12.0	12.0	85.0	18.5	12.0	12.0	2.5	TC*18...
STCR/L1212X18	12.0	12.0	120.0	18.5	12.0	12.0	2.5	TC*18...
STCR/L1616X18	16.0	16.0	120.0	18.5	16.0	16.0	0.0	TC*18...
STCR/L2020H18	20.0	20.0	100.0	18.5	20.0	20.0	0.0	TC*18...
STCR/L2020X18	20.0	20.0	120.0	23.0	20.0	25.0	0.0	TC*18...
STCR/L2525Z18	25.0	25.0	135.0	23.0	25.0	30.0	0.0	TC*18...

- 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...).

SPARE PARTS

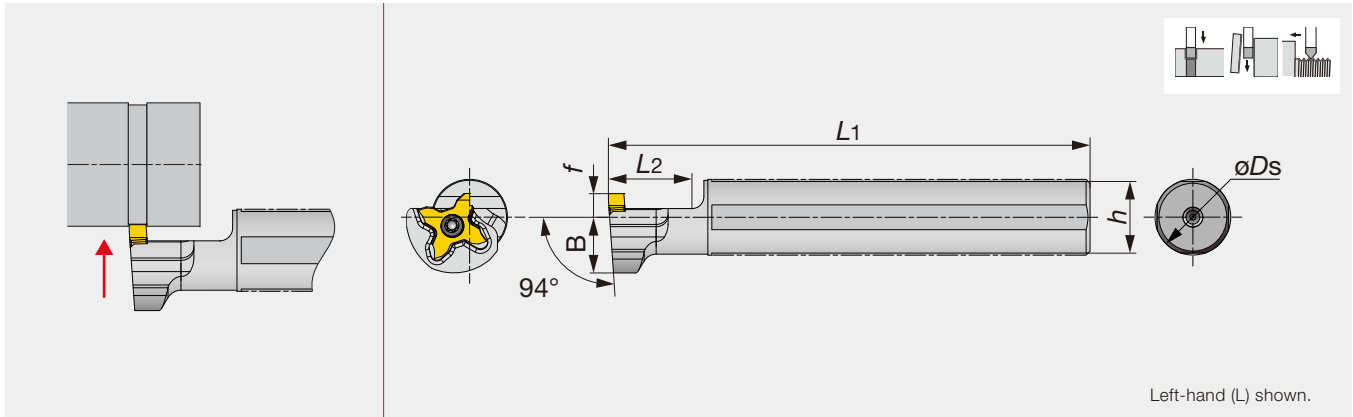


Designation	Clamping screw	Wrench
STCR...18	CSTC-4L100DL	T-1008/5
STCL...18	CSTC-4L100DR	T-1008/5

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

TOOLHOLDER - ROUND SHANK FOR GROOVING AND THREADING

TetraMini-Cut / TetraMini-Thread JS-STCL18



Designation	øDs	L1	L2	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 right hand insert (TC*18R***) is used for the left hand toolholders (STCL****)

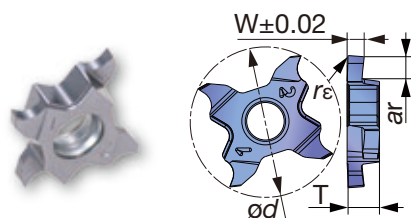
SPARE PARTS



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

INSERTS

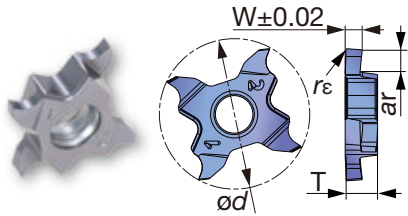
TCP18R/L-F (sharp edge)



Designation	Grade SH725		Dimensions (mm)				
	R	L	W	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-010	●	●	1	0.1	2	4	18
TCP18R/L120F-010	●	●	1.2	0.1	2	4	18
TCP18R/L125F-010	●	●	1.25	0.1	2	4	18
TCP18R/L145F-010	●	●	1.45	0.1	2	4	18
TCP18R/L150F-010	●	●	1.5	0.1	2	4	18
TCP18R/L175F-010	●	●	1.75	0.1	2	4	18
TCP18R/L200F-010	●	●	2	0.1	2.5	4	18
TCP18R/L250F-010	●	●	2.5	0.1	2.5	4	18
TCP18R/L300F-010	●	●	3	0.1	2.5	4	18

● : Line-up

TCP18R/L



Designation	Grade AH725		Dimensions (mm)				
	R	L	W	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
TCP18R/L145-010	●	●	1.45	0.1	2	4	18
TCP18R/L150-010	●	●	1.5	0.1	2	4	18
TCP18R/L175-010	●	●	1.75	0.1	2	4	18
TCP18R/L200-010	●	●	2	0.1	2.5	4	18
TCP18R/L250-010	●	●	2.5	0.1	2.5	4	18
TCP18R/L300-010	●	●	3	0.1	2.5	4	18

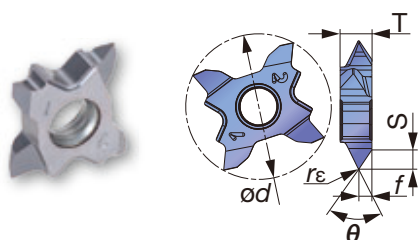
● : Line-up

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Priority	Grades	Cutting speed V _c (m/min)	Feed f (mm/rev)
P	Low carbon steel (C15, C20, etc.)	First choice	SH725	80 - 180	0.03 - 0.1
		Toughness	AH725	80 - 180	0.03 - 0.1
	Carbon steels, Alloy steel (C55, 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
K	Stainless steel (X5CrNi18-9, X5CrNiMo17-12-2, etc.)	First choice	SH725	50 - 120	0.03 - 0.1
		Toughness	AH725	50 - 120	0.03 - 0.1
	Grey cast iron (250, 300, etc.) Ductile cast iron (400-15, 600-3, etc.)	First choice	AH725	50 - 180	0.03 - 0.1
		Sharpness	SH725	50 - 180	0.03 - 0.1
		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

INSERTS

TCT18R/L (For Threading)

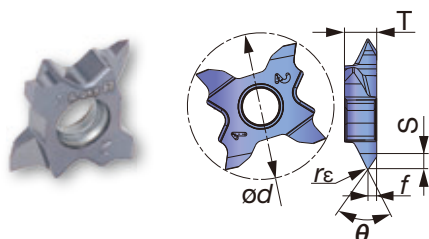


Designation	Grade AH725		pitch min	pitch max	Dimensions (mm)					ød
	R	L			f	S	r _ε	θ(°)	T	
TCT18R/L-60N-010	●	●	0.8	3	1.6	2.67	0.1	60	4	18
TCT18R/L-60N-020	●	●	1.5	3	1.6	2.57	0.2	60	4	18

● : Line-up

New

TCT18FR (For Threading / Sharp edge)



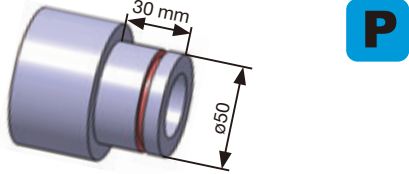
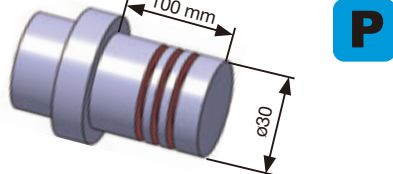
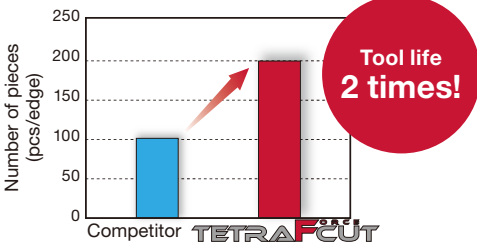
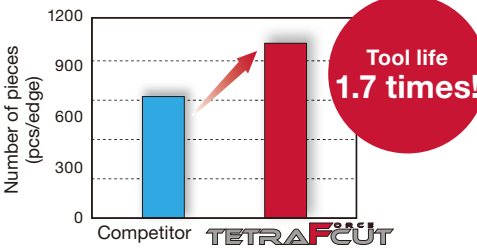
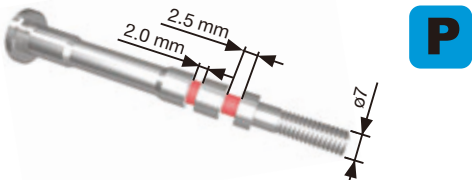
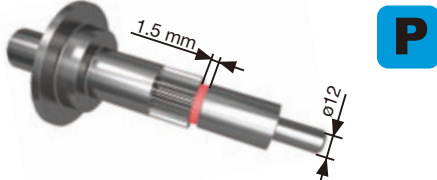
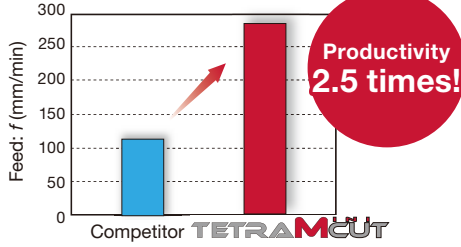
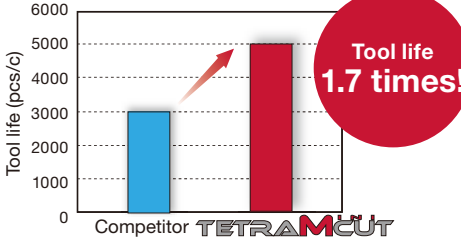
Designation	Grade SH725		pitch min	pitch max	Dimensions (mm)					ød
	R	L			f	S	r _ε	θ(°)	T	
TCT18FR-60A-005	●		0.4	1	0.6	0.99	0.05	60	4	18
TCT18FR-60A-010	●		1	2	1	1.63	0.1	60	4	18

● : Line-up

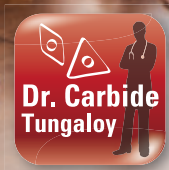
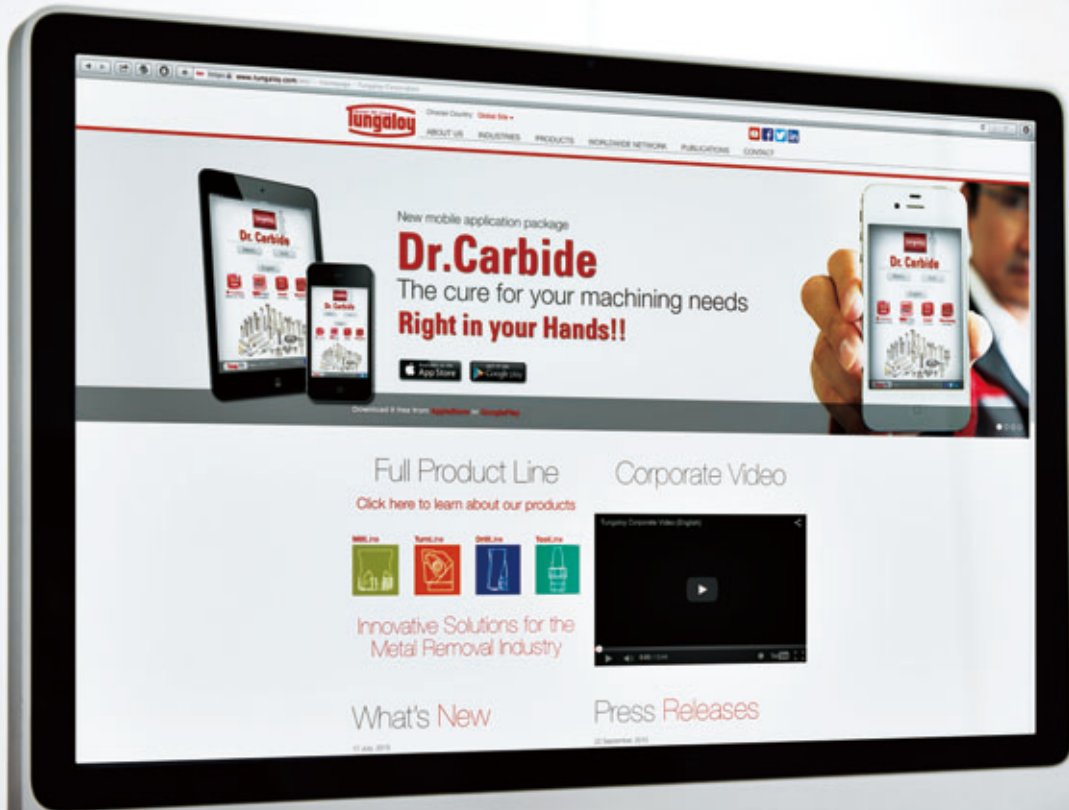
STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Grades	Cutting speed Vc (m/min)	Pitch (mm)	TPI
P	Low carbon steel (C15, C20, etc.)	AH725	60 - 150	0.8 - 3.0	32 - 8
	Carbon steels, Alloy steel (C55, 42CrMoS4, etc.)	AH725	60 - 150	0.8 - 3.0	32 - 8
	Prehardened steel (NAK80, PX5, etc.)	AH725	60 - 150	0.8 - 3.0	32 - 8
M	Stainless steel (X5CrNi18-9, X5CrNiMo17-12-2, etc)	AH725	50 - 80	0.8 - 3.0	32 - 8
K	Grey cast iron (250, 300, etc.)	AH725	50 - 100	0.8 - 3.0	32 - 8
	Ductile cast iron (400-15, 600-3, etc.)	AH725	50 - 100	0.8 - 3.0	32 - 8
S	Titanium alloys (Ti-6Al-4V, etc.)	AH725	30 - 100	0.8 - 3.0	32 - 8
	Superalloys (Inconel718, etc.)	AH725	30 - 100	0.8 - 3.0	32 - 8

PRACTICAL EXAMPLES

Workpiece type	Shaft stator	Input shaft	
Toolholder	STCR2525-27	STCR2525-27	
Insert	TCS27-200-020	TCS27-200-010	
Grade	AH725	AH725	
Workpiece material	S45C / C45	SCr415	
			
Cutting conditions	Cutting speed: V_c (m/min)	210	154
	Feed: f (mm/rev)	0.15	0.15
	Groove depth: a_r (mm)	2	5
	Groove width: w (mm)	2	2
	Machining	External grooving	External grooving
Coolant	Wet	Wet	
Machine	NC lathe	NC lathe	
Results	 <p>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.</p>	 <p>TetraForce-Cut machines 1000 pieces, which means tool life is 1.7 times longer than the competitor. Due to the high wear resistance of AH725 grade, TetraForce-Cut is possible to continue machining.</p>	
			
Cutting conditions	Cutting speed: V_c (m/min)	43	120
	Feed: f (mm/rev)	0.10	0.05
	Groove depth: a_r (mm)	1.5 / 1.1	1.5
	Groove width: w (mm)	2 / 2.5	1.5
	Machining	External grooving	External grooving
Coolant	Wet	Wet	
Machine	Swiss lathe	NC lathe	
Results	 <p>Due to the rigid clamping, TetraMini-Cut is applicable with higher feed than the competitor, achieving 2.5 times better productivity.</p>	 <p>TetraMini-Cut insert in SH725 grade provides excellent sharpness and wear resistance, reducing burr and extending tool life.</p>	

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