

Tungaloy

Member IMC Group

Keeping the Customer First

Tungaloy Report No. 416-E

TURNLINE

New grooving tools with 4 cornered inserts

TETRACUT

NEW

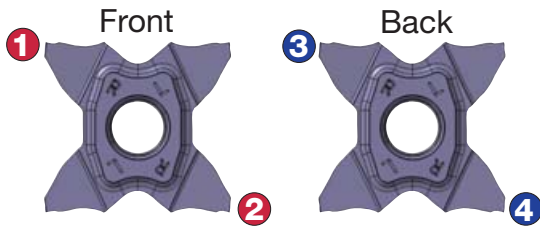
Intelligent solution for grooving



Smart and economical tool for grooving and parting off!

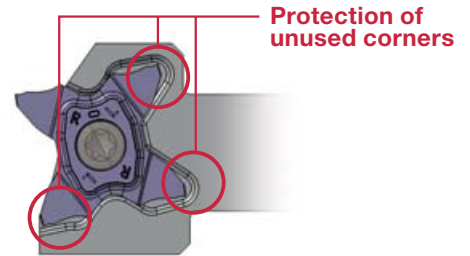
Ground insert with 4 cutting edges offers economical machining

- One type of insert can be used on both right and left hand toolholder. * Except handed inserts



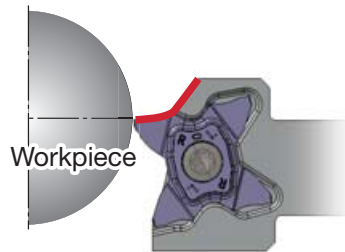
Uniquely designed insert pocket protects unused corners

- Unused corners are protected from unexpected damages caused by chips.



Excellent chip control

- Applicable for a wide range of cutting conditions
- Wide pocket allows smooth chip flow
- Unique chipbreaker provides excellent chip control and low cutting forces



Comparison of chip control

Alloy steel **SCM440 / 42CrMo4 (ø32)**

Condition	Feed: <i>f</i> (mm/rev)		
	0.05	0.10	0.15
TETRACUT			
Competitor A			Not recommended condition
Competitor B			Not recommended condition

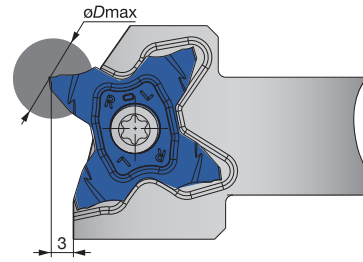
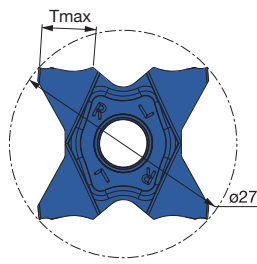
Insert : TCS27-200-020
 Grade : AH725
 Toolholder : STCR2525-27
 Cutting speed : $V_c = 150$ m/min
 Coolant : Wet

Stainless steel **SUS316 / X5CrNiMo17-12-3 (ø32)**

Condition	Feed: <i>f</i> (mm/rev)		
	0.05	0.10	0.15
TETRACUT			
Competitor A			Not recommended condition
Competitor B			Not recommended condition

Insert : TCS27-200-020
 Grade : AH725
 Toolholder : STCR2525-27
 Cutting speed : $V_c = 120$ m/min
 Coolant : Wet

Insert

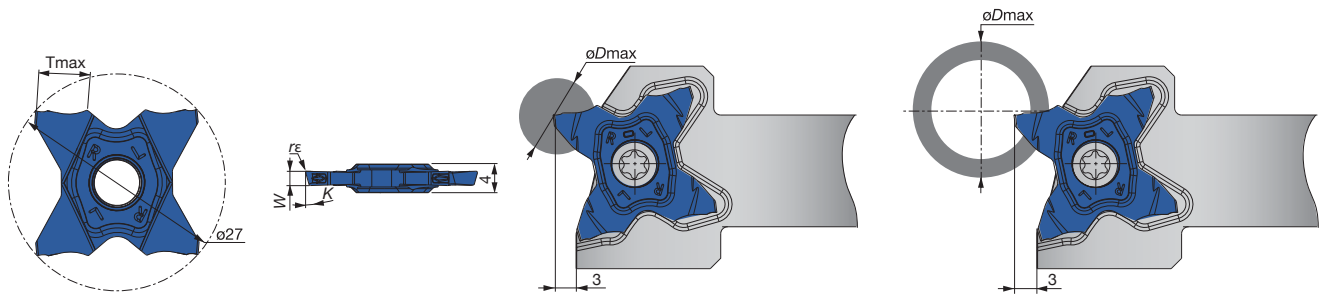


4 cornered insert for grooving and parting off

Right hand (R) shown.

Cat. No.	Stock	Dimensions (mm)				Relation of groove depth (T) and Max. diameter (øDmax)												
	Coating	Cutting edge width W ±0.02 (mm)	Corner radius r _ε	Max. grooving depth T _{max}	Max. parting off diameter (solid bar) øD _{max}													
	AH725					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	-

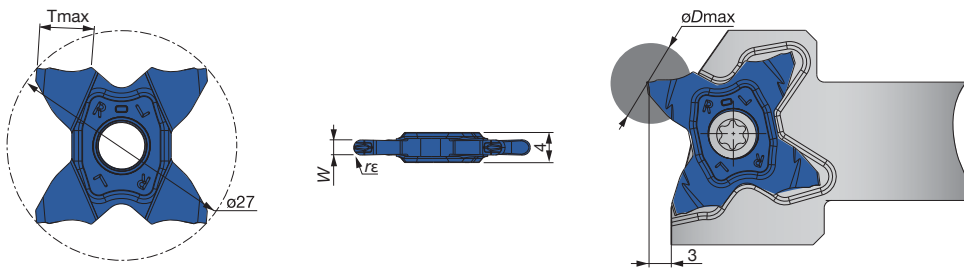
● : Stocked items



4 cornered & handed inserts for grooving and parting off

Right hand (R) shown.

Cat. No.	Stock		Dimensions (mm)				Max. parting off dia. ϕD_{max} (mm)	
	Coating		Cutting edge width $W \pm 0.02$ (mm)	Corner radius r_{ϵ}	Max. grooving depth T_{max}	Front edge angle K	Solid bar	Tube
	AH725							
	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



4 cornered inserts with full radius for grooving and profiling

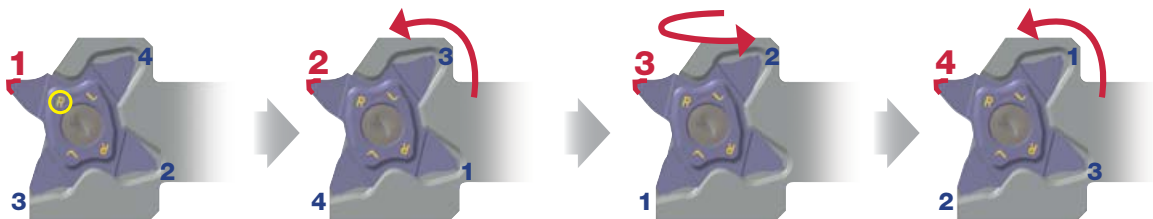
Right hand (R) shown.

Cat. No.	Stock		Dimensions (mm)			Relation of groove depth (T) and Max. diameter (ϕD_{max})											
	Coating		Cutting edge width $W \pm 0.02$ (mm)	Corner radius r_{ϵ}	Max. parting off diameter (solid bar) T_{max}												
	AH725					$T \leq 1.0$	$T \leq 2.0$	$T \leq 3.0$	$T \leq 3.5$	$T \leq 4.0$	$T \leq 4.5$	$T \leq 5.0$	$T \leq 5.5$	$T \leq 5.7$	$T \leq 6.0$	$T \leq 6.2$	$T \leq 6.4$
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

● : Stocked items

Cautionary points for use

How to index insert

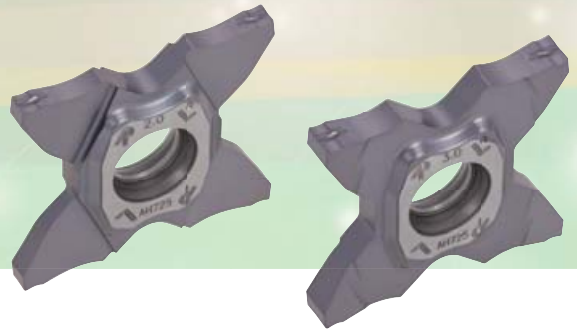


1. Right hand edge (R) is used for the right hand toolholders

2. Rotate insert

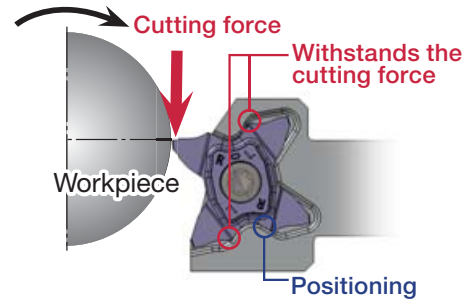
3. Flip over insert

4. Rotate insert



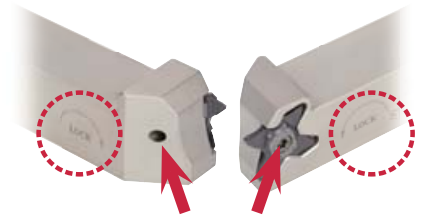
Unique clamping system

- Provides high rigidity and repeatability due to the 3 contact points.
- Exclusive screw for each hand of tool offers rigid and stable clamping.



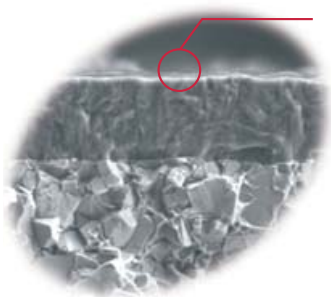
Permits operation from backside

- Insert screw can be operated from rear side. This simplifies operation on small lathes.
- Operating direction is marked on the toolholder to prevent incorrect operation.



Grade

■ AH725



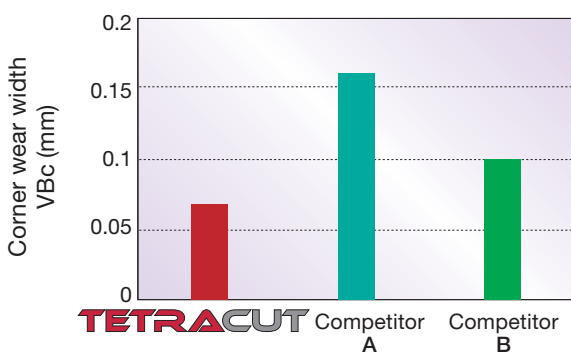
Special Surface Technology

PREMIUMTEC

TUNGALOY

- Newly developed coating with well controlled crystal structure and fracture resistance.
- Improved adhesion strength.
- Fine grain substrate with high toughness and plastic deformation resistance.

■ Comparison of wear resistance

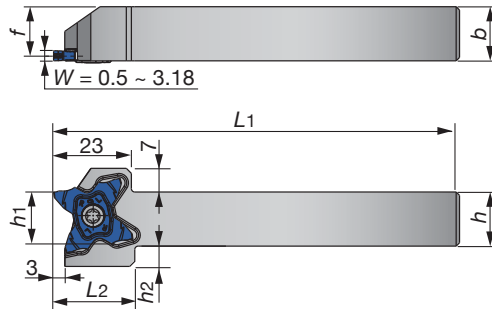


Comparison of corner wear width after 18 min machining

Insert	: TCS27-200-020
Grade	: AH725
Work material	: SCM440 (ø75)
Cutting speed	: $V_c = 150$ m/min
Feed	: $f = 0.06$ mm/rev
Cutting edge width	: $W = 2$ mm
Coolant	: Wet

External toolholders

STC R/L External grooving



Right hand (R) shown.

Cat. No.	Stock		Dimensions (mm)							Parts		Wrench
	R	L	h ₁	b	h	L ₁	f	h ₂	L ₂	Screw		
										R	L	
STCR/L1010-27	●	●	10	10	10	120	8.5	9.5	24	SR16-212-01397L	SR16-212-01397	T-2010/5
STCR/L1212-27	●	●	12	12	12	120	10.5	8	24			
STCR/L1616-27	●	●	16	16	16	120	14.5	6	24			
STCR/L2020-27	●	●	20	20	20	120	18.5	2	24			
STCR/L2525-27	●	●	25	25	25	135	23.5	-	-			

● : Stocked items

Standard cutting conditions

Work materials	Grades	Cutting speed V _c (m/min)	Feed <i>f</i> (mm/rev)			Depth of cut for profiling (with full radius insert) <i>a_p</i> (mm)
			Grooving, Parting off	Parting off (with hand)	Profiling (with full radius insert)	
Steels (S45C / C45 etc.)	AH725	100 ~ 200	0.05 ~ 0.10	0.04 ~ 0.12	0.05 ~ 0.10	Max 0.5
Alloy steels (SCM435 / 34CrMo4 etc.)		50 ~ 180				
Stainless (SUS304 / X5CrNi18-9 etc.)		50 ~ 150				
Grey cast irons (FC250 / 250 / GG25 etc.)		50 ~ 180				
Ductile cast irons (FCD400 / 400-15 / GGG400 etc.)		50 ~ 120				
Titanium alloys (Ti-6Al-4V etc.)		30 ~ 60				



Tungaloy Corporation

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