

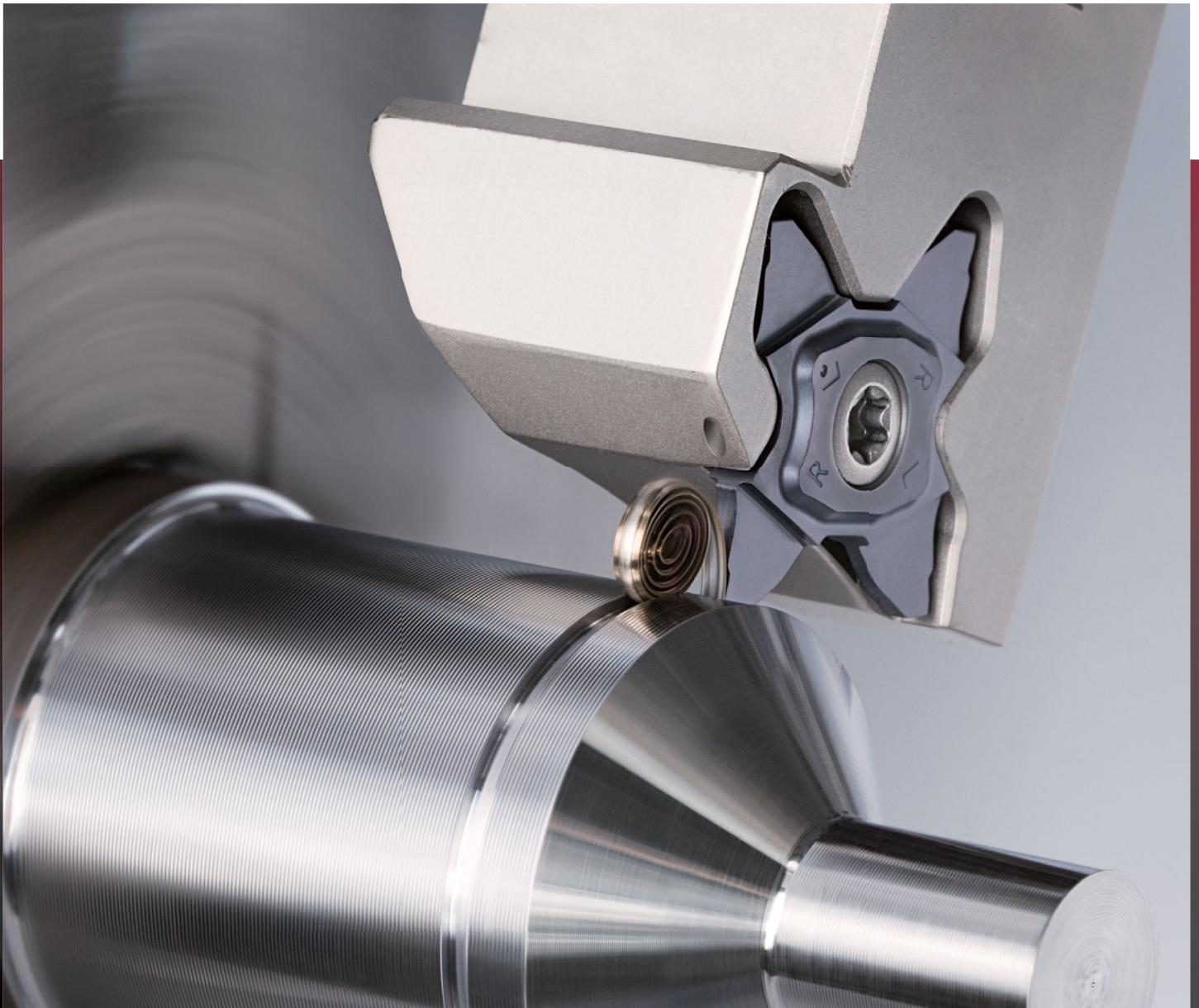


High precision grooving tool

TETRA^{ORCE}**FCUT**

Tungaloy Report No. 416S9-G

Introducing the latest PVD grade **AH7025**



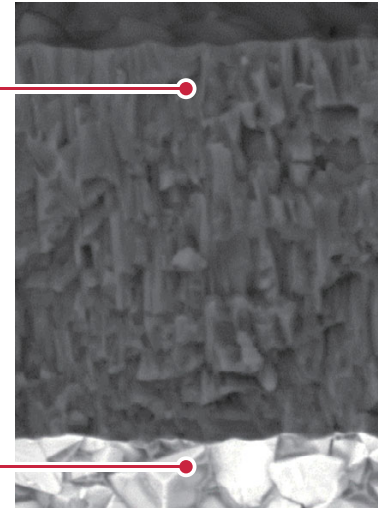
Ideal grade for grooving, profiling and parting off applications

AH7025

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 layer and carbide substrate

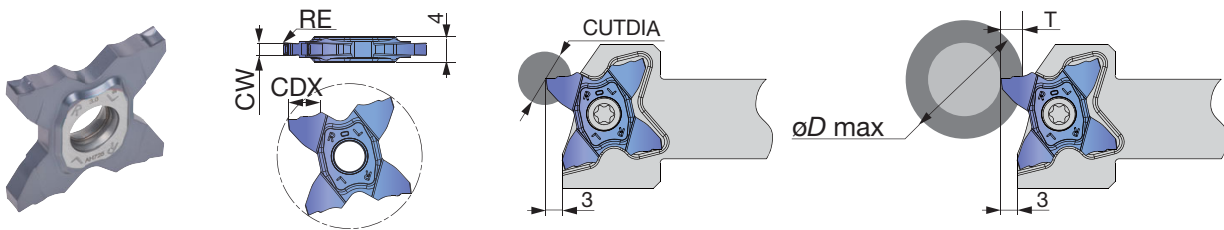
High wear and fracture resistant carbide substrate for optimal grooving performance



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

INSERTS

New TCL27 (for grooving and parting off)



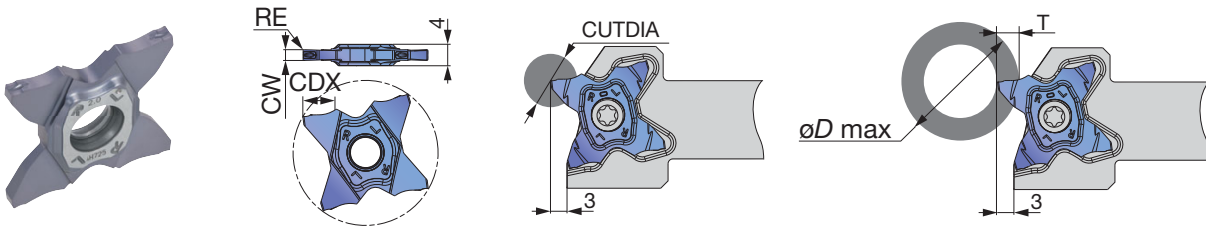
P	Steel	★
M	Stainless	★
K	Cast iron	★
N	Non-ferrous	
S	Superalloys	★
H	Hard materials	

★ : First choice

Designation	CW±0.02	RE	Coated AH7025	CDX	CUTDIA	Relation of groove depth (T) and Max. diameter (øD max)									
						T ≤ 3	T ≤ 3.5	T ≤ 4	T ≤ 4.5	T ≤ 5	T ≤ 5.5	T ≤ 5.7	T ≤ 6	T ≤ 6.2	T ≤ 6.4
TCL27-150-015	1.5	0.15	●	5.7	11.4	∞	600	280	180	130	50	35	-	-	-
TCL27-200-020	2	0.2	●	6.4	12.8	∞	600	280	180	130	105	85	60	50	30
TCL27-250-020	2.5	0.2	●	6.4	12.8	∞	600	280	180	130	105	85	60	50	30
TCL27-300-020	3	0.2	●	6.4	12.8	∞	600	280	180	135	105	95	85	78	55

5 pieces per package
● : New product

New TCS27 (for grooving and parting off)



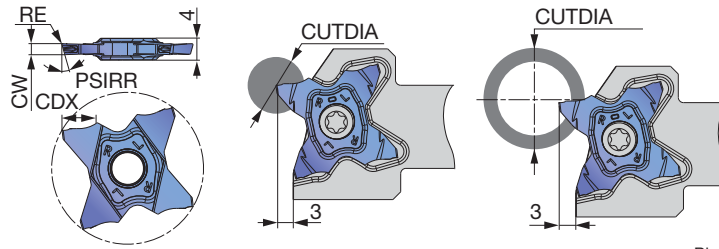
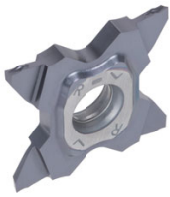
P	Steel	★	
M	Stainless	★	
K	Cast iron	★	
N	Non-ferrous		
S	Superalloys	★	
H	Hard materials		

★ : First choice

Designation	CW±0.02	RE	Coated		CDX	CUTDIA	Relation of groove depth (T) and Max. diameter (øD max)										
			AH7025				T ≤ 3	T ≤ 3.5	T ≤ 4	T ≤ 4.5	T ≤ 5	T ≤ 5.5	T ≤ 5.7	T ≤ 6	T ≤ 6.2	T ≤ 6.4	
TCS27-075-010	0.75	0.1	●		2.5	5	∞	-	-	-	-	-	-	-	-	-	-
TCS27-100-006	1	0.06	●		3.5	7	∞	600	-	-	-	-	-	-	-	-	-
TCS27-100-010	1	0.1	●		3.5	7	∞	600	-	-	-	-	-	-	-	-	-
TCS27-125-010	1.25	0.1	●		3.5	7	∞	600	-	-	-	-	-	-	-	-	-
TCS27-125-020	1.25	0.2	●		3.5	7	∞	600	-	-	-	-	-	-	-	-	-
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	-	-
TCS27-300-020	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	

5 pieces per package
● : New product

New TCS27-R/L (for parting off)



Right hand (R) shown.

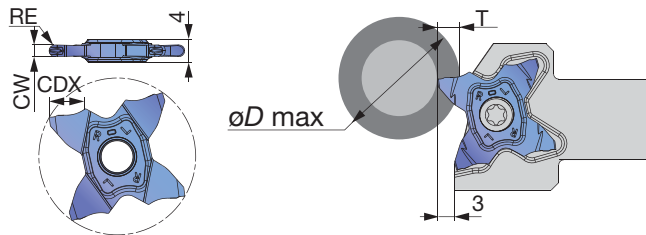
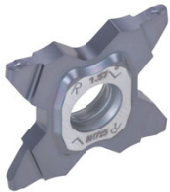
P	Steel	★		
M	Stainless	★		
K	Cast iron	★		
N	Non-ferrous			
S	Superalloys	★		
H	Hard materials			

★ : First choice

Designation	HAND	CW±0.02	RE	Coated		CDX	PSIRL	PSIRR	Max. parting off dia. CUTDIA	
				AH7025					Solid bar	Tube
TCS27-100-15R	R	1	0.06	●		3.5	0°	15°	7	600
TCS27-100-15L	L	1	0.06	●		3.5	15°	0°	7	600
TCS27-150-6R	R	1.5	0.06	●		5.7	0°	6°	11.4	35
TCS27-150-6L	L	1.5	0.06	●		5.7	6°	0°	11.4	35
TCS27-150-15R	R	1.5	0.06	●		5.7	0°	15°	11.4	35
TCS27-150-15L	L	1.5	0.06	●		5.7	15°	0°	11.4	35
TCS27-200-6R	R	2	0.1	●		6.4	0°	6°	12.8	30
TCS27-200-6L	L	2	0.1	●		6.4	6°	0°	12.8	30
TCS27-200-15R	R	2	0.1	●		6.4	0°	15°	12.8	30
TCS27-200-15L	L	2	0.1	●		6.4	15°	0°	12.8	30

5 pieces per package
● : New product

New TCS27 (for grooving and profiling, full R)



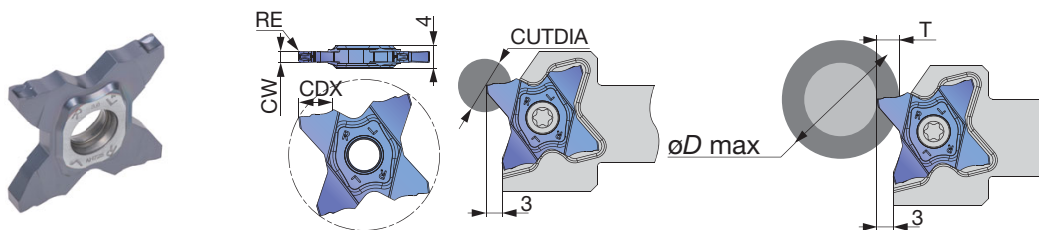
P	Steel	★		
M	Stainless	★		
K	Cast iron	★		
N	Non-ferrous			
S	Superalloys	★		
H	Hard materials			

★ : First choice

Designation	CW±0.02	RE	Coated		CDX	Relation of groove depth (T) and Max. diameter (øD max)										
			AH7025			T ≤ 3	T ≤ 3.5	T ≤ 4	T ≤ 4.5	T ≤ 5	T ≤ 5.5	T ≤ 5.7	T ≤ 6	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	-

5 pieces per package
● : New product

New TCM27 (for grooving and parting off)



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

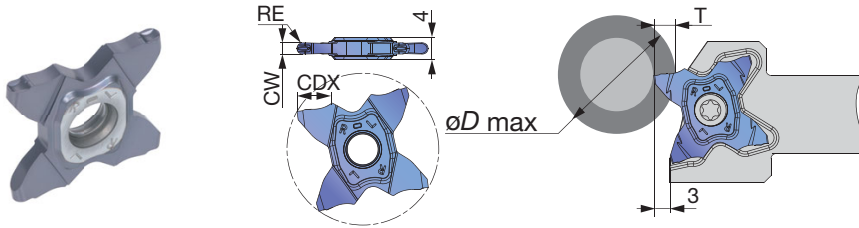
★ : First choice

Designation	CW±0.02	RE	Coated		CDX	CUTDIA	Relation of groove depth (T) and Max. diameter (øD max)									
			AH7025				T≤3	T≤3.5	T≤4	T≤4.5	T≤5	T≤5.5	T≤5.7	T≤6	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	6	∞	-	-	-	-	-	-	-	-	-
TCM27-170-010	1.7	0.1	●		3	6	∞	-	-	-	-	-	-	-	-	-
TCM27-175-010	1.75	0.1	●		3	6	∞	-	-	-	-	-	-	-	-	-
TCM27-175-020	1.75	0.2	●		3	6	∞	-	-	-	-	-	-	-	-	-
TCM27-178-018	1.78	0.18	●		3	6	∞	-	-	-	-	-	-	-	-	-
TCM27-185-020	1.85	0.2	●		3	6	∞	-	-	-	-	-	-	-	-	-
TCM27-196-015	1.96	0.15	●		3	6	∞	-	-	-	-	-	-	-	-	-
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	∞	600	-	-	-	-	-	-	-	-
TCM27-230-020	2.3	0.2	●		3.5	7	∞	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	-
TCM27-300-020	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

5 pieces per package

● : New product

New TCM27 (for grooving and profiling, full R)



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

★ : First choice

Designation	CW±0.02	RE	Coated		CDX	CUTDIA	Relation of groove depth (T) and Max. diameter (øD max)										
			AH7025				T≤3	T≤3.5	T≤4	T≤4.5	T≤5	T≤5.5	T≤5.7	T≤6	T≤6.2	T≤6.4	
TCM27-157-079	1.57	0.79	●		3	6	∞	-	-	-	-	-	-	-	-	-	-
TCM27-200-100	2	1	●		3	6	∞	-	-	-	-	-	-	-	-	-	-
TCM27-239-120	2.39	1.2	●		5.7	11.4	∞	600	280	180	130	50	35	-	-	-	-
TCM27-300-150	3	1.5	●		6.4	12.8	∞	600	280	180	135	105	95	85	78	55	55


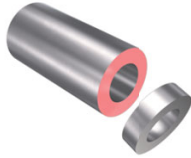
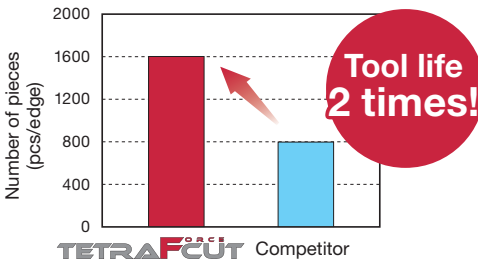
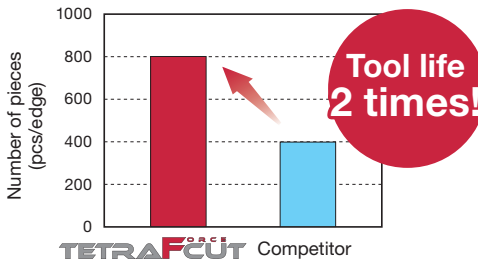

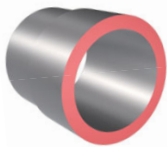
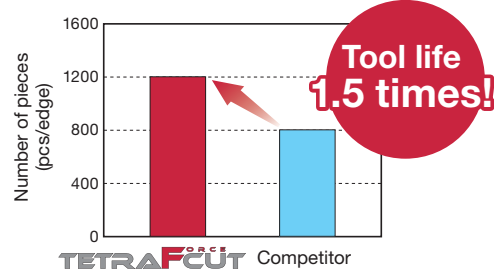
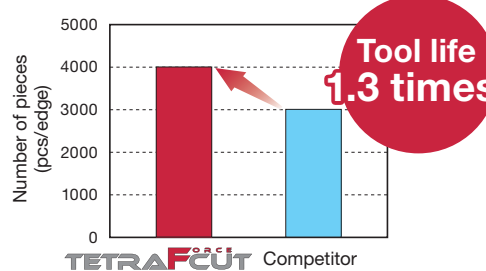
5 pieces per package
● : New product

STANDARD CUTTING CONDITIONS

TCL27, TCS27, TCM27

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)		
				TCL27	TCS27	TCM27	TCS27	TCS27	TCM27	
P	Carbon steel S45C / C45, etc.	AH7025	100 - 200	0.03 - 0.12	0.05 - 0.15	0.05 - 0.25	0.04 - 0.12	0.05 - 0.1	0.05 - 0.15	0.5
	Alloy steel SCM435 / 34CrMo4, etc.	AH7025	50 - 180	0.03 - 0.12	0.05 - 0.15	0.05 - 0.25	0.04 - 0.12	0.05 - 0.1	0.05 - 0.15	
M	Stainless steel SUS304 / X5CrNi18-9, etc.	AH7025	100 - 150	0.03 - 0.12	0.05 - 0.15	0.05 - 0.2	0.04 - 0.12	0.05 - 0.1	0.05 - 0.15	0.5
K	Grey cast iron FC250 / 250, etc.	AH7025	50 - 180	0.03 - 0.12	0.05 - 0.15	0.05 - 0.25	0.04 - 0.12	0.05 - 0.1	0.05 - 0.15	0.5
	Ductile cast iron FCD400 / 400-15, etc.	AH7025	50 - 120	0.03 - 0.12	0.05 - 0.15	0.05 - 0.2	0.04 - 0.12	0.05 - 0.1	0.05 - 0.15	
S	Titanium alloys Ti-6Al-4V, etc.	AH7025	30 - 60	0.03 - 0.12	0.05 - 0.15	0.05 - 0.15	0.04 - 0.12	0.05 - 0.1	0.05 - 0.1	0.5
	Superalloys Inconel718, etc.	AH7025	20 - 50	0.03 - 0.12	0.05 - 0.15	0.05 - 0.15	0.04 - 0.12	0.05 - 0.1	0.05 - 0.1	

PRACTICAL EXAMPLES

Workpiece type		Shaft	Front fork tube
Toolholder		STCR2525-27-CHP	STCR1616-27
Insert		TCS27-100-006	TCS27-150-15L
Grade		AH7025	AH7025
Workpiece material		SCM435 / 34CrMo4	SUS304 / X5CrNi18-9
		 P	 M
Cutting conditions	Cutting speed : V_c (m/min)	80	100
	Feed : f (mm/rev)	0.07	0.05
	Groove depth : CDX (mm)	3	2.5
	Groove width : CW (mm)	1	1.5
	Machining	External grooving	Parting off
	Coolant	Wet	Wet
Machine		NC lathe	NC lathe
Results		 <p>Due to the high wear resistance, AH7025 doubles tool life compared to the competitor. TCS chipbreaker improves chip control in which the competitor's chipbreaker has problems.</p>	 <p>AH7025 grade insert, provided 2 times tool life increase, while eliminating edge chipping during the machining of parting-off operation.</p>
		<p>Results</p>	
Workpiece type		Punch pin sleeve	Plunger
Toolholder		STCR2020-27-CHP	STCR2020-27
Insert		TCM27-300-020	TCL27-200-020
Grade		AH7025	AH7025
Workpiece material		SS400 / E275A	SWCH20
		 P	 P
Cutting conditions	Cutting speed : V_c (m/min)	120	160
	Feed : f (mm/rev)	0.2	0.1
	Groove depth : CDX (mm)	3	4
	Groove width : CW (mm)	3	2
	Machining	External grooving	Parting off
	Coolant	Wet	Wet
Machine		NC lathe	NC lathe
Results		 <p>Thanks to its high wear resistance, AH7025 has successfully machined 1,200 parts and was still able to continue.</p>	 <p>Tool life was increased by 1.3 times with AH7025 grade thanks to its good balance of wear and fracture resistance.</p>
		<p>Results</p>	

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