

# Design for High-Temperature Alloys and Titanium Alloys —AC451S Milling Grade

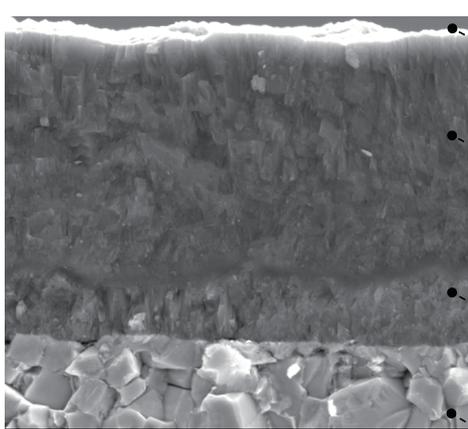


## High-Efficiency Milling Grade for Difficult-to-Machine Materials

# AC451S



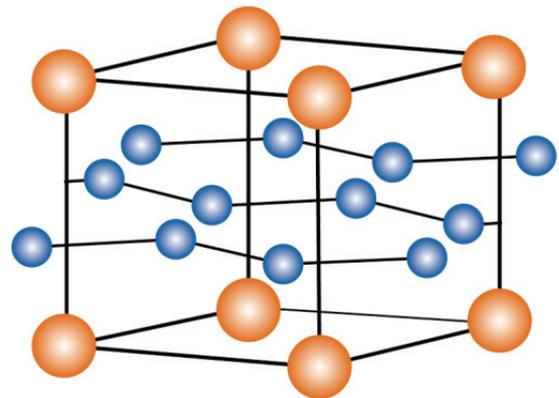
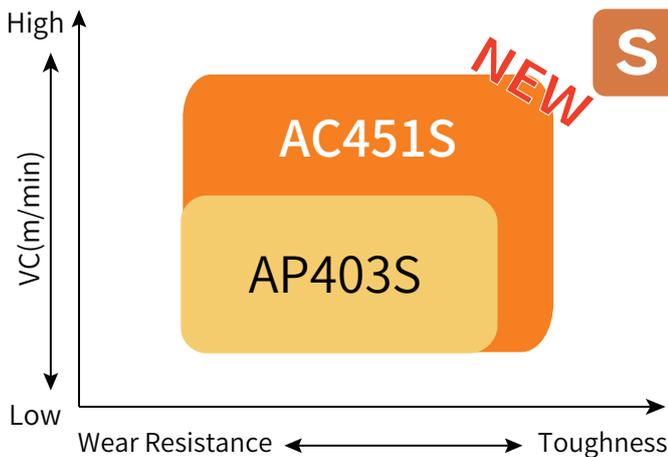
### Grade features



- Special post-treatment, smooth surface
- Nanocrystalline boride coating, with extremely high hardness
- The gradient transition layer design enhances the bonding strength
- Special substrate, Combining both wear resistance and impact resistance

- ACHTECK Tools has innovatively launched the AC451S dedicated milling grade, providing an efficient solution for difficult-to-machine materials such as high-temperature alloys and titanium alloys.
- Strengthened substrate enhances impact resistance and toughness, while the ultra-smooth, high-hardness CVD coating significantly reduces the friction coefficient and cutting heat, thereby suppressing issues such as cracking and work hardening.
- AC451S delivers superior performance that drastically extends tool life and process reliability. It helps users overcome efficiency barriers, reduce costs, and power a more efficient, reliable future for high-end manufacturing

### Application area

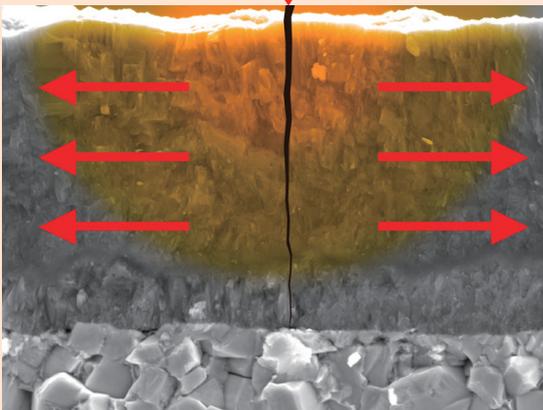


Precisely engineered coating composition and structure deliver superior wear resistance

Material	High-Temperature Alloy								Titanium Alloy							
Application	Finishing				Roughing				Finishing				Roughing			
ISO	S10	S20	S25	S30	S35	S40	S45	S50	S10	S20	S25	S30	S35	S40	S45	S50
<b>S</b>				AC451S							AC451S					
Vc	20-80m/min								30-120m/min							

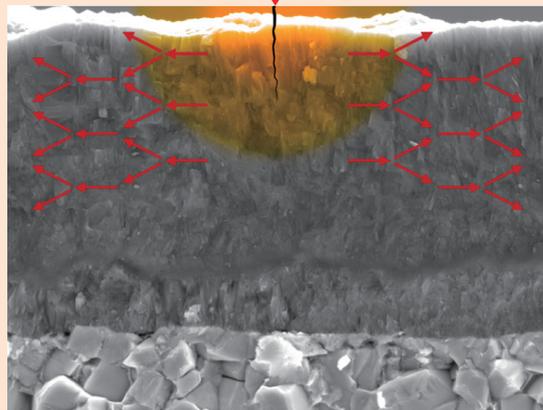
## Impact resistance comparison

Impact Load



**Traditional product**

During high-speed cutting, impact loads on the insert tend to concentrate. Simultaneously, under tensile stress, cracks originating in the insert substrate can easily propagate into the coating.

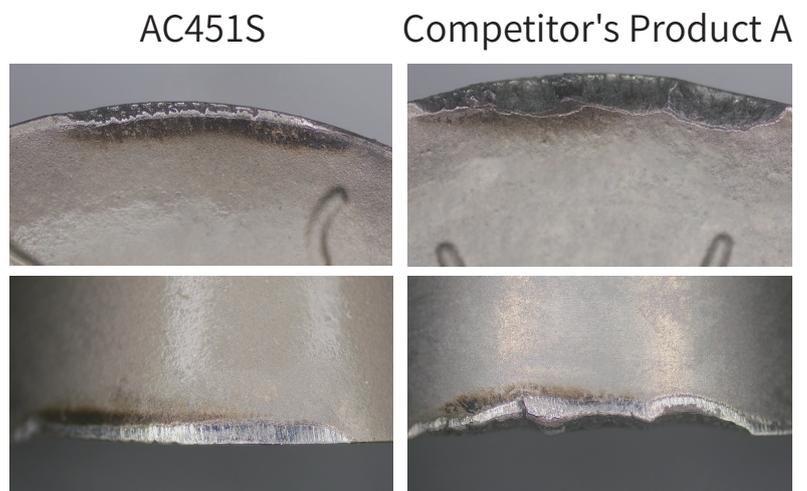


**AC451S**

The new coating technology effectively alleviates tensile stress and dissipates the impact loads generated during high-speed cutting, thereby suppressing crack propagation and coating delamination.

## Wear Resistance Comparison

Workpiece	Block
Material	GH4169
Cutter	APM00-032-Z03-C32R-RO12-C
Insert	ROHT 1204M8E-MM3 AC451S
Machining	Face Roughing Milling
Vc	45m/min
ap	1mm
ae	20mm
fz	0.2mm/t
Coolant	Wet



Under the same conditions and same machining time, AC451S exhibits less wear

● **Product Range**

Insert	Figure	Product code	Dimensions (mm)					Grade
			IC	S	RE	BS	D1	AC451S
		ROHT 0803M4E-MM3	8.00	3.18	-	-	3.4	○
		ROHT 10T3M8E-MM3	10.0	3.97	-	-	3.4	●
		ROMT 10T3M4E-MR6	10.0	3.97	-	-	3.4	○
		ROHT 1204M4E-MM3	12.0	4.76	-	-	4.4	●
		ROMT 1204M4E-MM4	12.0	4.76	-	-	4.4	●
		ROMT 1204M6E-MR6	12.0	4.76	-	-	4.4	○
		ROHT 1204M6E-MM3	12.0	4.76	-	-	4.4	○
		ROHT 1204M8E-MM3	12.0	4.76	-	-	4.4	●
		ROMT 1605M6E-MR6	16.0	5.56	-	-	5.5	●
		RPMT 1204MOE-T1000	12.0	4.76	-	-	4.4	●
		ROHT 0803MOE-MM3	8.00	3.18	-	-	3.4	○
		LNMX 060410ER-MM3	6.35	3.6	1.0	-	3.0	●
		LNMX 060410ER-MM4N	6.35	3.6	1.0	-	3.0	●
		LNMX 100512ER-MM3	9.20	4.55	1.2	-	4.2	●
		XDLT 090408ER-MM3	9.52	4.76	0.8	1.3	3.9	●
		XDLT 120508ER-MM3	12.7	5.56	0.8	2.2	4.4	●
		SDMT 09T320N-MM4	9.52	3.97	2.0	-	3.9	○
		AOMT 120408ER-MM4	8.15	5.07	0.8	1.5	3.9	●
		AOMT 120420ER-MM4	8.15	5.07	2.0	1.0	3.9	○
		AOMT 120431ER-MM4	8.15	5.07	3.1	0.6	3.9	●
		AOMT 10T308ER-MM4	6.85	3.83	0.8	1.5	3.0	○
		AOMT 10T316ER-MM4	6.85	3.83	1.6	1.2	3.0	○
		ADMT 11T308R-MM4	6.92	3.59	0.8	1.41	2.8	○
		ADMT 11T320R-MM4	6.92	3.59	2.0	0.23	2.8	○
		RPM 080ER-MM4	6.90	3.2	8.0	-	2.9	●
		RPM 100ER-MM4	8.63	3.9	10.0	-	3.5	○

● -Standard stock ○ -Made-to-Order

## Application case 1

Workpiece: Blade

Material: GH1040

Cutter: APM00-025-Z03-M12R-RO10-C

Insert: ROHT 10T3M8E-MM3 AC451S

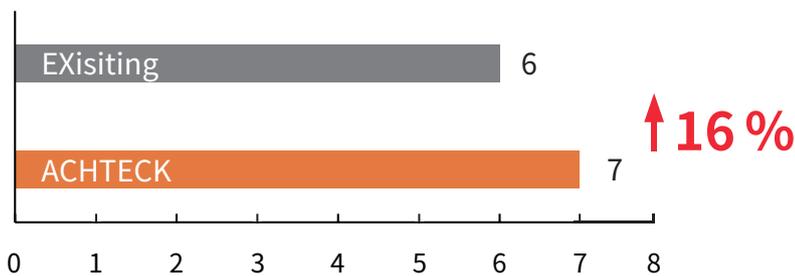
Machining : Profile machining

Cutting Parameter:  $V_c=53$  m/min,  $a_p=0.3$  mm  
 $a_e=15$  mm,  $f_z=0.1$ mm/t

Coolant: Wet



Tool life (pcs)



## Application case 2

Workpiece: Mounting Flange

Material: GH4169

Cutter: AHM20-021-Z03-C20R-LN06-L160-C

Insert: LNMX 060410ER-MM3 AC451S

Machining : Sided Roughing

Cutting Parameter:  $V_c=46$  m/min,  $a_p=0.5$  mm  
 $a_e=21$  mm,  $f_z=0.3$  mm/t

Coolant: Wet



Tool life (pcs)

