

Case Studies

17Cr3 (SCr420H) (58HRC)	
<ul style="list-style-type: none"> • Gear • External and Face machining and Chamfering • Vc=425 sfm • d.o.c.=0.024" • f=0.005 ipr • WET • CNGA432S00525ME (KBN05M) 	
KBN05M	300 pcs/edge
Competitor A	200 pcs/edge
<p>•KBN05M achieved 1.5 times longer tool life than Competitor A. ⇒Its longer tool life contributes to cost-cutting.</p> <p>(Evaluation by the user)</p>	

15CrMo4 (SCM415) (55HRC)	
<ul style="list-style-type: none"> • Stator • Internal machining • Vc=550 sfm • d.o.c.=0.016" • f=0.004 ipr • WET • CNGA432S00525ME (KBN05M) 	
KBN05M	600 pcs/edge
Competitor B	300 pcs/edge
<p>•KBN05M achieved twice longer tool life than Competitor B. ⇒Its longer tool life contributes to cost-cutting.</p> <p>(Evaluation by the user)</p>	

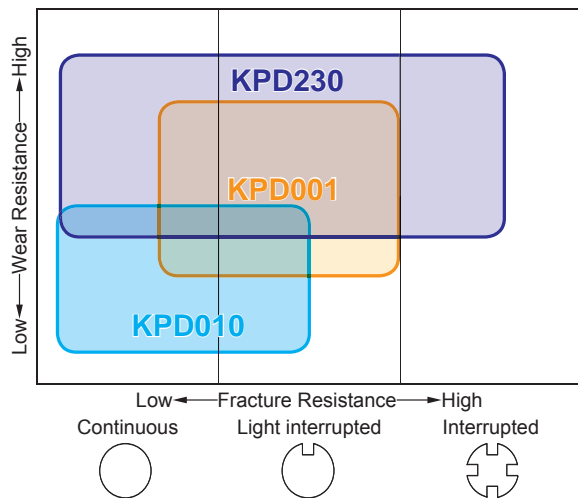
25CrMo4 (SCM420) (60HRC)	
<ul style="list-style-type: none"> • Gear Parts • Interrupted face machining • Vc=300 sfm • d.o.c.=0.02" • f=0.005 ipr • Wet⇒Dry • CNGA433S000525ME (KBN25M) 	
KBN25M	70 pcs/edge
Competitor C (CBN tool)	30 pcs/edge (Unstable)
<p>KBN25M improved tool life up to 70 pieces/edge than is two times more than competitor's (CBN tool) B. Also, KBN25M has increased its tool life up to 250 pieces/edge by changing from wet machining to dry machining.</p> <p>(Evaluation by the user)</p>	

25CrMo4 (SCM420) (58HRC)	
<ul style="list-style-type: none"> • Sleeve • Internal machining (Heavy interrupted) • Vc=325 sfm • d.o.c.=0.02" • f=0.004 ipr • Wet • TPGB222S00435MET (KBN35M) 	
KBN35M	115 pcs/edge
Competitor D	100 pcs/edge
<p>•KBN35M achieved 15% longer tool life in heavy interrupted machining compared with Competitor D. •Furthermore it still keeps the insert tip in a good condition and so provides stable machining result. ⇒Its longer tool life and capability of providing stable result can contribute to cost-cutting and improved efficiency in machining.</p> <p>(Evaluation by the user)</p>	


Recommended Cutting Conditions

Workpiece Material	Hardness	Application		Insert Grade	Cutting Conditions		
					Vc (sfm)	ap (in)	f (ipr)
Heat Treated Steel	Over 55HRC	General Finishing	Continuous~Light interruption	KBN05M	330 - 490 - 660	0.002 - 0.012 - 0.020	0.002 - 0.003 - 0.004
		High Efficient Stable Cutting	Continuous~Interruption	KBN25M	260 - 390 - 520	0.002 - 0.012 - 0.020	0.002 - 0.003 - 0.004
		Interrupted (Small ap)	Interrupted~Heavy interruption	KBN35M	200 - 330 - 490	0.002 - 0.008 - 0.016	0.002 - 0.003 - 0.004
		Heavy Cutting	Continuous~Interruption	KBN900	230 - 300 - 360	0.020 - 0.039 - 0.079	0.002 - 0.004 - 0.008
	Under 55HRC	Finishing	Continuous	PT600M	200 - 260 - 390	0.008 - 0.020 - 0.028	0.002 - 0.004 - 0.006
Gray Cast Iron	Under 250HB	Finishing	Continuous~Light interruption	KBN60M	980 - 1970 - 2620	0.002 - 0.008 - 0.020	0.001 - 0.002 - 0.004
		High Efficient Finishing	Continuous~Light interruption	KBN900	1640 - 2950 - 3940	0.004 - 0.020 - 0.039	0.002 - 0.004 - 0.008
		Heavy Cutting	Continuous~Interruption	KBN900	1640 - 2300 - 2950	0.020 - 0.059 - 0.118	0.004 - 0.012 - 0.02
Roll Materials (Chilled Cast Iron)	Over 55HRC	Finishing	Continuous~Interruption	KBN25M	260 - 390 - 520	0.002 - 0.012 - 0.020	0.002 - 0.003 - 0.004
		Heavy Cutting	Continuous~Interruption	KBN900	230 - 300 - 360	0.012 - 0.028 - 0.039	0.002 - 0.004 - 0.006
Sintered steel	Under 35HRC	Finishing	Continuous~Light interruption	KBN65M	160 - 490 - 660	0.002 - 0.008 - 0.012	0.002 - 0.004 - 0.008
	Over 35HRC	Finishing	Continuous~Interruption	KBN70M	330 - 660 - 820	0.002 - 0.008 - 0.012	0.002 - 0.004 - 0.008

PCD Area Map



Advantages of PCD

Material	Symbol	Average grain size (μm)	Advantages
 Non-ferrous metal	KPD001	0.5	<ul style="list-style-type: none"> Super Micro-Grain PCD features cutting edge strength, wear resistance, fracture resistance, good edge-sharpening performance and long, stable tool life. Application: 1st choice for high speed cutting of aluminum alloys, brass, non-ferrous metals and non-metals including
	KPD010	10	<ul style="list-style-type: none"> Good wear resistance and toughness, good grindability Application: General purpose, high speed cutting of aluminum alloys, non-ferrous metals and non-metals including plastics, fiberglass, carbide and ceramics.
	KPD230	2-30	<ul style="list-style-type: none"> Superior abrasive wear resistance and toughness due to high density PCD with mixed rough and fine grains Application: High speed milling of aluminum alloys, non-ferrous metals, plastics and fiberglass

Recommended Cutting Conditions

Workpiece Material	Insert Grade		Cutting Conditions				Remarks
	KPD001	KPD010	Cutting Speed V_c (SFM)	D.O.C. (inch)		Feed Rate f (ipr)	
				Small edge (SE) and Positive Insert	Negative (except SE) Insert		
Aluminium Alloy Zinc Alloy	★	☆	990~3300	~0.0394	~0.0787	0.0012~0.0197	Both Dry and Wet Cutting available
Copper, Brass, Bronze	★	☆	990~3300	~0.0394	~0.0787	0.0012~0.0197	
Magnesium Alloy	★	☆	1320~3960	~0.0394	~0.0787	0.0012~0.0197	
Sintered Carbide	★	☆	30~100	~0.0118	~0.0118	0.0012~0.0039	
Titanium Alloy	★	☆	330~660	~0.0394	~0.0787	0.0020~0.0079	Wet Cutting
Reinforced Fiberglass Carbon Fiber Plastics	★	☆	330~1980	~0.0394	~0.0787	0.0020~0.0197	Dry Cutting
Silica Filling Plastic Particle Board	★	☆	1320~2640	~0.0394	~0.0787	0.0020~0.0197	

★: 1st Recommendation ☆: 2nd Recommendation