WecoTool
Member of SHAREATE group

INDEXABLE INSERT 2025 CATALOG

SHAREATE TOOLS LTD.

SHAREATE TOOLS LTD.

Add : No.6 Weixi Road, Suzhou Industrial Park, Jiangsu,215121, China
Tel : 86 (512) 6285 0656 / 86(512)6285 1667
Fax : 86 (512) 6285 1661
Web : www.shareate.com
E-mail : info@shareate.com

Enhance value with quality.

To be a cutting tool enterprise with international influence in the Chinese cutting tool industry.

WecoTool

Member of SHAREATE group

SHAREATE

SHAREATE TOOLS LTD.

Shareate Tools Ltd. was founded in 2005 as a multinational corporation engaged in the research and development, manufacturing, sales and services of cemented carbide products, rock drilling tools and comprehensive mining services.

In October 2021, Shareate was officially listed on the SSE STAR Market. The group owns several domestic and overseas subsidiary companies, including Shareate Wuhan, Zhuzhou Weco, Suzhou D&M, Australia AMS, America AMS, and others, which were acquired or established through joint ventures.

Shareate has been granted 72 invention patents and 380 utility model patents. We are accredited with the API Spec Q1 and ISO 9001 certifications.Our group company serves six fields: carbide, rock drilling tools, cutting tools, petroleum instrumentation, electric drilling equipment, and mining exploration services. The products are exported to 6 continents in more than 60 countries, including cemented carbide such as mining carbide, carbide rod, wear-resistant alloy and precision components, and rock drilling tools such as rotary drill bit series, dth drilling tool series, top hammer drilling tool series.

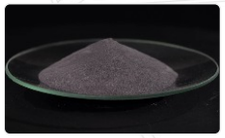
Shareate as a leader in modern manufacturing and service integration, we operate state-of-the-art factories that adhere to the highest international standards, and work closely with customers worldwide to create best-in-class products and solutions to overcome the most challenging technical problems.

PRODUCTS CHAIN


Tungsten Mining


Cobalt Mining


WC Powder


Cobalt Powder

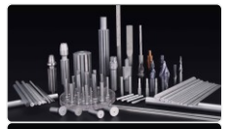
SHREATE

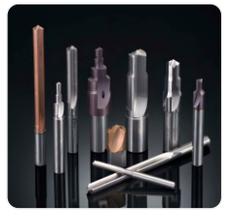

Mining Carbide


Rock Drilling Tools


Wear-resistant Carbide

Wear-resistant Tools


Carbide Rods


Round Tools

Precision Cutting Tool
Member of SHREATE group


Cermet Inserts


Carbide Inserts

WecoTool
Member of SHREATE group


Mining


Construction


Automotive Industry

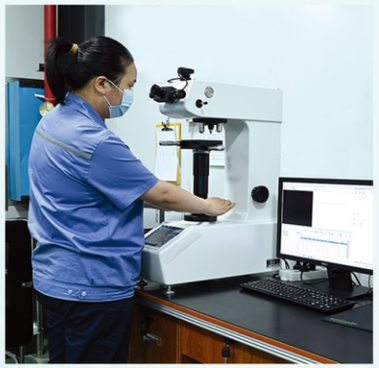

Electronics


Machining

HIGH QUALITY GUARANTEE

We owns a complete CNC insert production line, including compound preparation, mold making, deep processing, coating, etc., and is committed to the R&D and application solutions of high-performance CNC blades.

Equipped with several world's top precision high-end equipment. OSTERWALDER multi-axis electric press, CNCperipheral grinder, Balzers coating furnace, Our company adopts automatic numerical control equipments for raw material preparation, pressing, sintering, coating and product inspection. Also We has advanced equipments such as Mikron machining center and Carl Zeiss CMM. At the same time, Our company applys a variety of international leading coating processes and world-class quality control system to ensure the same quality of each insert, provide customers with high-quality CNC blades and improve the production efficiency of users, and fully meet the market's high requirements for product quality.



Contents

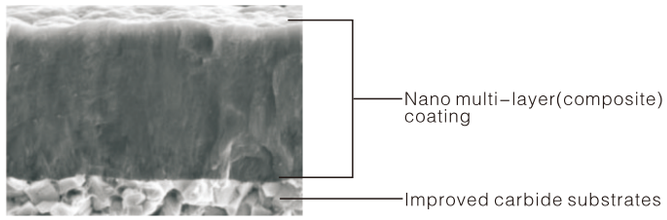
Speed = Efficiency New

VR series - Machining of high temperature alloys at line speeds of up to 80m/min

PVD for Hi-temp Alloy

VR1X10/1X25/1X31

Technical Features



1. Improved special matrix for increased hardness and strength at high temperatures
2. Nano multi–layer, composite coating technology, precise control of coating composition
3. Excellent bonding between coating and substrate and inter–coatings bonding to ensure stable processing
4. Special post–treatment process, smooth and dense coating surface, high bonding strength; reduce cutting resistance, improve tool life and workpiece finish

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VR1010

The ultra–fine grain matrix strengthened by the bonding phase has excellent heat resistance and wear resistance.
It is suitable for finishing/semi–finishing turning of heat–resistant alloys and hardend materials,
and general–purpose milling of hardened materials.

VR1525

General grade that combines wear resistance and toughness
Excellent heat resistance and oxidation resistance, the first choice for semi–finish machining of high temperature alloys

VR1031

Excellent tough matrix combined with nano multi–layer coating
Excellent chipping resistance, ideal for rough milling of high temperature alloys

Grade

1 Cutting Characteristics of Ni-based High Temperature Alloys

A.High cutting force; high temperature alloys have good plasticity and high strength, and the cutting force required for processing is 2–5 times that of ordinary steel.

B.High cutting temperature: High temperature alloys have low thermal conductivity, so heat is concentrated and not easily diffused during machining. Fast tool abrasion.

C.Machining hardening is serious: when cutting, its hardness of the machining surface and the machined surface is 50–100% higher than the substrate

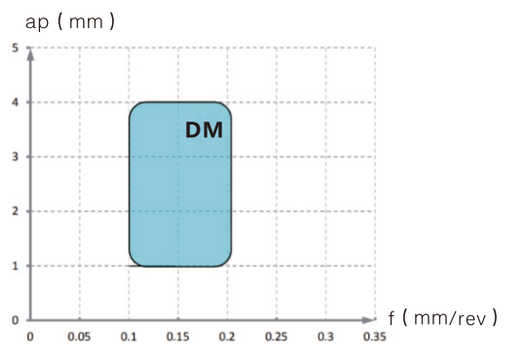
D.Tool is easy to wear: easy to bond, spread, oxidation and groove wear when cutting

E.Difficult to break chips: high temperature alloy chips are hard and tough, not easy to break, and difficult to chip discharge

2 Features of -DM Chip Breaker for High Temperature Alloy

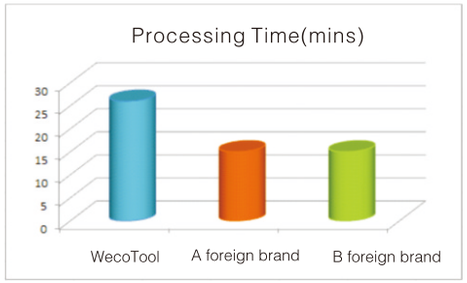
- Double large rake angle design, sharp cutting edge, low cutting resistance, reduce groove wear effectively
- Special chip breaker and sufficient chip pocket design for effective chip breaking and holding
- Special treatment of the cutting edge, good integrity and high wear resistance
- Good coating adhesion, smooth surface, smooth chip removal, good blade life

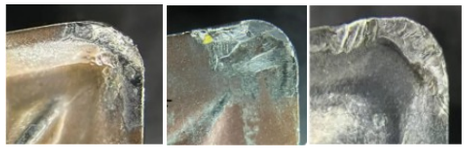
Cutting Range Chart



Case No.1

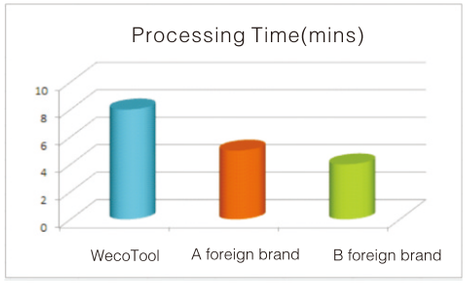
Workpiece: Aircraft Components
Workpiece material: Inconel 718
Processing equipment: vertical lathe
WeCan insert: CNMG120408–DM VR1510
Comparison insert: CNMG120408, a foreign brand
Comparison insert: CNMG120408, b foreign brand
Processing: Turning
Cutting parameters: Vc: 55m/min
f: 0.23mm/rev
ap: 0.5mm
Conclusion: Our insert takes 26 minutes to process, while the two competitors take 15 minutes to process.
From the perspective of insert wear, WeCan's insert wear is relatively small, and the cost–effectiveness is extremely high.





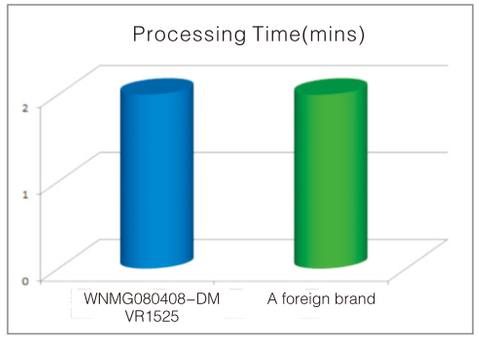
Case No.2

Workpiece: Aircraft Components
Workpiece material: Inconel 718
Processing equipment: horizontal lathe
WeCan insert: CNMG120408–DM VR1510
Comparison insert: CNMG120408, a foreign brand
Comparison insert: CNMG120408, b foreign brand
Processing: Turning
Cutting parameters: Vc: 55m/min
f: 0.28mm/rev
ap: 3.8mm
Conclusion: Our insert processing takes 8 minutes, while our two competitors process for 4 and 5 minutes respectively. Our insert life is better than our competitors, and the cost–effectiveness is higher.



Case No.3

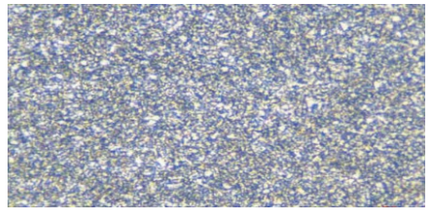
Workpiece material: cast steel Inconel 718
Workpiece: Top Wire
Cooling type: Fluid cooling
Comparision insert: a foreign brand
WeCan Insert: WNMG080408–DM VR1525
Cutting parameters: Vc: 40m/min, ap: 2mm, f: 0.21mm/rev
Conclusion: Our insert cutting is light and fast, with good chip breaking and low cutting resistance, which is comparable to the lifespan of a foreign brand. However, our insert has a high cost performance ratio.

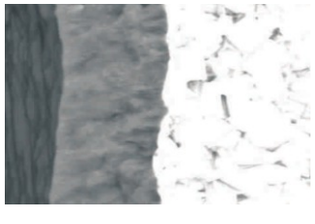


Heat Resistant Alloys / Titanium Alloys Finishing Series

New

VK1605



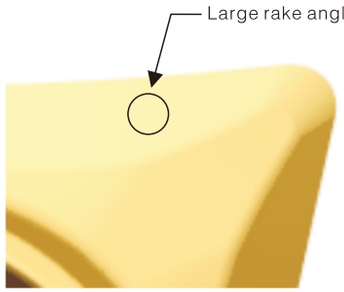


★ ISO:S05–S15 H05–H15 N05–N15
★ Low cobalt, ultra–fine grain hard alloy matrix, excellent wear resistance and heat resistance;
★ Paired with PVD High Power Impulse Magnetron Sputtering (HIPIMS) nano composite coating, the strongest coating adhesion and smooth surface;
1. High hardness turning grade for small parts;
2. Suitable for turning of P, M, and S type materials;
3. Longer processing life and higher surface smoothness.

Chip Breaker Features of -FL

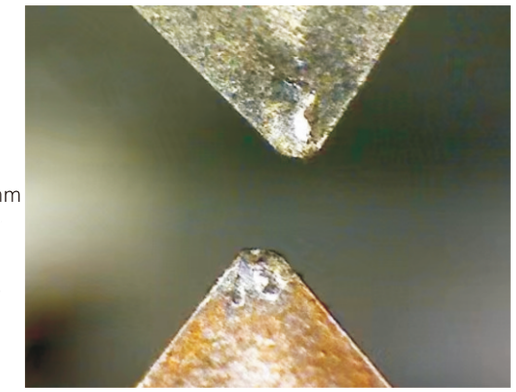
- Precision grinding of the periphery, with high indexing accuracy.
- The large rake angle design makes a very sharp edge structure.
- The sharp cutting edge design ensures low cutting force and wide edge band further ensuring the
- sharpness of the cutting edge and ensuring good chip breaking.

Surface polishing treatment and smooth chip discharge lead to excellent surface processing quality.



Case No.1

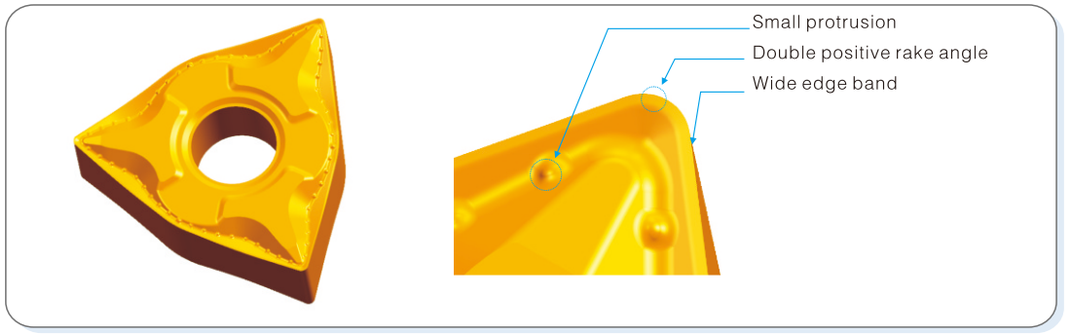
Workpiece: Aircraft Components
Workpiece material: GH4169
Processing equipment: horizontal lathe
WeCan insert: CCGT09T302–FL VK1605
Comparison insert: CCGT09T302 a foreign brand
Processing: Turning
Cutting parameters: Vc: 40m/min f: 0.15mm/rev ap: 0.1mm
Conclusion: Under the same parameter conditions, after processing for 1 hour, the wear of our insert and the safety insert are relatively similar, with a similar lifespan. Our insert has a high cost performance ratio.



Processing Sword for Stainless Steel

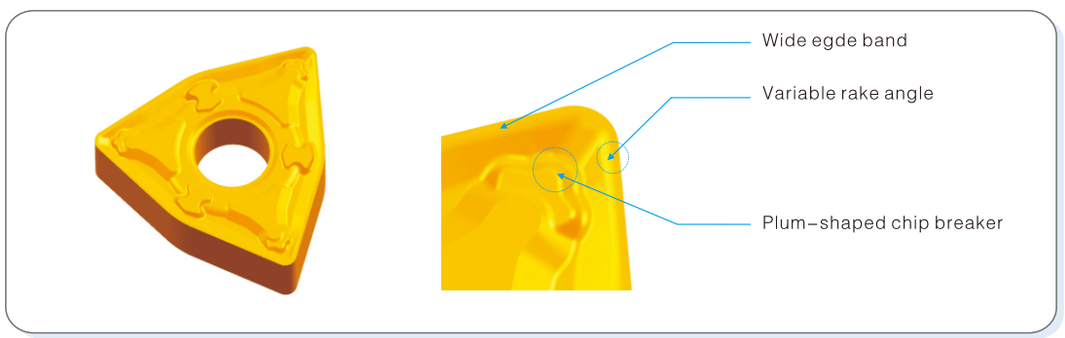
1 Chip Breaker Features of Stainless Steel Finishing -BF

- Double large positive rake angle, fully ensure the sharpness of the edge
- Small protrusions are more conducive to chip breaks
- Large cutting edge inclination can guide the chip flow very well
- Low cutting resistance, high surface finish of machined parts



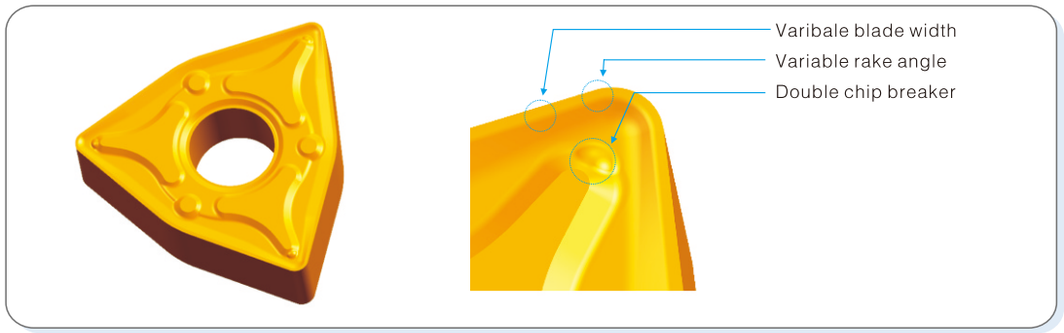
2 Chip Breaker Features of Stainless Steel Semi-Finishing -BM

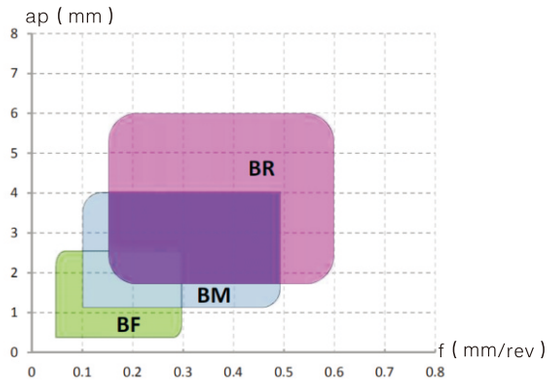
- The combination of variable blade width and variable rake angle takes into account the sharpness and strength of the cutting edge.
- Plum–shaped chip breaker structure, widen the chip breaking range of the insert
- Suitable for semi–finishing of stainless steel.



❸ Chip Breaker Features of Stainless Steel Finishing -BR

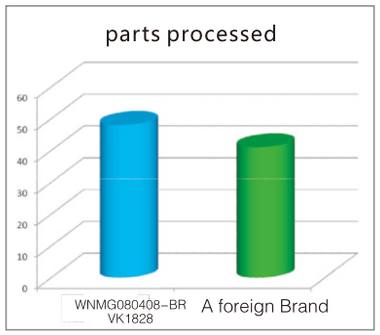
- Variable blade width and variable rake angle design, taking into account the sharpness and strength of the blade
- Large chip breaker and chip pocket design provides excellent chip breaking effect.
- Double chip breaker design expands the backbreaking range.
- Suitable for semi–finishing to rough machining of stainless steel

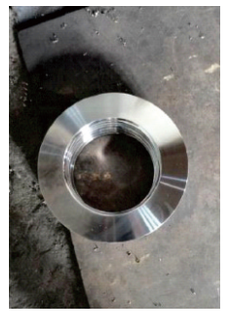




Case No.1

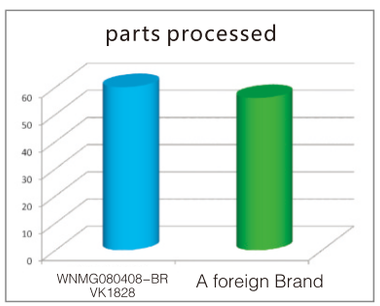
Workpiece material:stainless steel SUS304
Workpiece: Flange
Cooling type:Fluid cooling
Original blade:A foreign brand
WeCan insert:WNMG080408–BR VK1828
Cutting parameter:Vc:153m/min, f:0.2mm/rev , ap:1 –2mm
Conclusion: Used for boring, uneven cutting allowance, our inserts processed 48 pieces, a foreign brand processed 41 pieces, tool life increased by 17%, and has the advantage of cost performance.

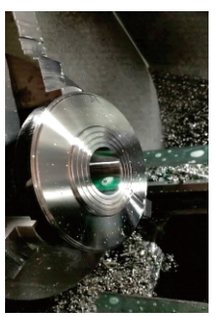




Case No.2

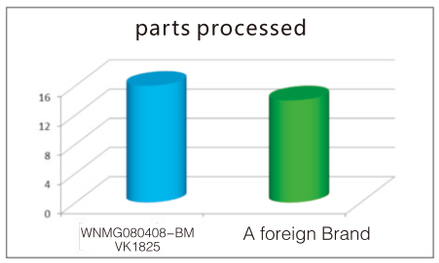
Workpiece material:stainless steel SUS304
Workpiece:Flange
Cooling type:Fluid cooling
Original blade:A foreign brand
WeCan insert:WNMG080408–BR VK1828
Cutting parameter:Vc:170m/min , f:0.2mm/rev, ap:1–1.5mm
Conclusion: Processing stainless steel flange end face, our inserts processed 69 pieces, a foreign brand processed 56 pieces, tool life increased by 23%, the advantage is obvious and the customer is very satisfied.





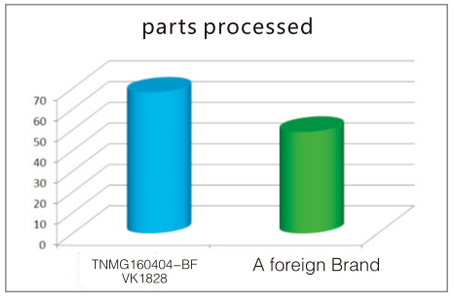
Case No.3

Workpiece material:stainless steel SUS304
Workpiece: Flange
Cooling type:Fluid cooling
Original blade:A foreign brand
WeCan insert:WNMG080408–BM VK1825
Cutting parameter:Vc:220m/min f:0.2–0.3mm/rev ap:0.8–1.5mm
Conclusion: processing flange outer circle, our inserts processed 16 pieces, a foreign brand processed 14 pieces, tool life increased by 14%, and our inserts processing work piece surface finish better than competitors.



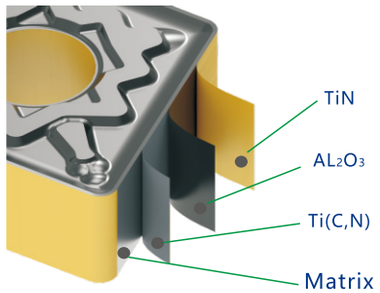
Case No.4

Workpiece material:stainless steel SUS304
Workpiece:pipe joint
Cooling type:Fluid cooling
Original blade:A foreign brand
WeCan insert:TNMG160404–BF VK1828
Cutting parameter:Vc:47m/min f:0.1mm/rev ap:1mm
Conclusion: Machining the outer circle of pipe joint, our inserts processed 68 pieces, a foreign brand processed 49 pieces, the tool life increased by 39%, the cost performance advantage is obvious.



NEW

VK44SERIES Upgraded CVD Material for Steel Processing



Wear status recognition layer, yellow coating makes it easier to observe the wear of the front and rear cutting surfaces of the insert.

Excellent heat insulation and high temperature resistance layer, especially suitable for high–speed processing.

Stronger wear resistance and high–temperature stability can significantly improve tool life.

The matrix is designed specifically for steel processing, reduced the defects in alloys and improves the toughness of inserts.

The Intro of CVD Grades

VK4415 ISO:P05-P20

- Medium temperature CVD coating, used for finishing to semi–finishing turning of steel, continuous and light intermittent processing;
- Excellent wear resistance enables long service life processing at high speed under good working conditions.

VK4420 ISO:P10-P25

- High wear resistance, good red hardness under high–temperature, recommended for continuous cutting and slight intermittent cutting
- Key recommendation for continuous roughing of large workpieces

VK4425 ISO:P15-P35

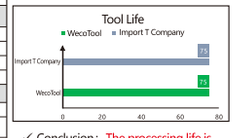
- Medium temperature CVD coating, with both wear resistance and toughness, recommended for continuous and intermittent processing.
- The first recommended grade for steel parts processing.

The Application of CVD Grades

Workpiece	P	M	S
Application	Wearness ⟷ Toughness	Wearness ⟷ Toughness	Wearness ⟷ Toughness
ISO	01 10 20 30 40 50	01 10 20 30 40 50	01 10 20 30 40 50
CVD Grades	VK4415, VK4420, VK4425		

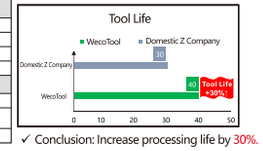
Case

Info.	Import T Company	WecoTool
Lathe	Horizontal CNC lathe	
Workpiece material	55#	
Hardness	HB220–240	
Workpiece	Hub unit	
Processing type	Intermittent roughing	
Cutter	MWLNR2525 M08	
Insert	TNMG080412–¤M T¤¤25	TNMG080412–AM VK4425
Cutting Parameter		
Vc(m/min)	180–300	180–300
f(mm/rev)	0.2–0.3	0.2–0.3
ap(mm)	1.0–1.5	1.0–1.5
Cooling Type	External cooling emulsion	
Test Result		
pcs/edge	70–75	**70–75**
Processing Time(min)		
VB(mm)	0.31	0.32



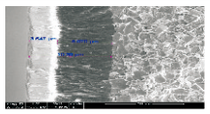
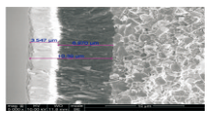
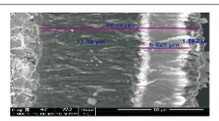
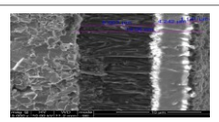
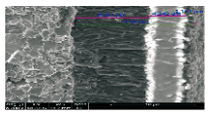
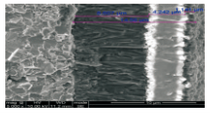
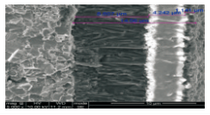
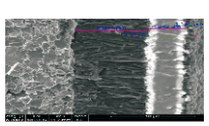
✓ Conclusion: The processing life is basically the same.

Info.	Domestic Z Company	WecoTool
Lathe	Horizontal CNC lathe	
Workpiece material	Gr15	
Hardness	HB180–220	
Workpiece	Bearing Ring	
Processing type	External semi–finishing of continuous turning	
Cutter	PWLNL2525 M08	
Insert	TNMG080408–¤M T¤C15¤	TNMG080408–AM VK4415
Cutting Parameter		
Vc(m/min)	360	360
f(mm/rev)	0.25	0.25
ap(mm)	2	2
Cooling Type	External cooling	
Test Result		
pcs/edge	30 blade	40 blade
Processing Time(min)		
VB(mm)	0.31	0.32

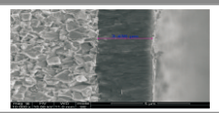
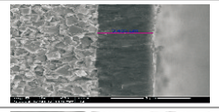
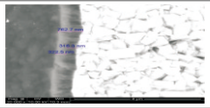
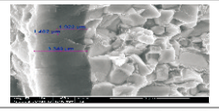
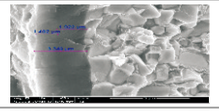
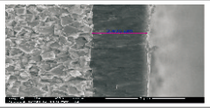
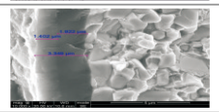
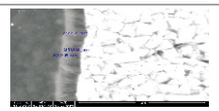
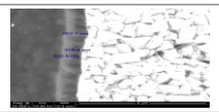
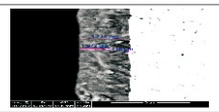
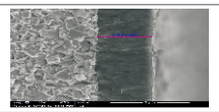


✓ Conclusion: Increase processing life by 30%.

The Features of CVD Coating

ISO	Grade	Colour	Coating Structure		Electron Microscopy Images	Features.Application
K Cast Iron	VK3020	Black	$TiCN+Al_2O_3$			High hardness matrix, thinned CVD coating, excellent wear resistance.Milling gray cast iron and ductile iron under stable working conditions.
	VK3040	Black	$TiCN+Al_2O_3$			High toughness matrix, thinned CVD coating, excellent resistance to chipping.Rough milling of cast iron, especially in harsh working conditions.
	VK3115	Black	$TiCN+Al_2O_3$			Optimized and extremely wear-resistant material, nano thick film CVD coating.Continuous or light intermittent turning of gray cast iron and ductile iron.
P Steel	VK4215	Yellow Black	$TiCN+Al_2O_3+$ (TiN)			Wear-resistant substrate with resistance to plastic deformation, strongand tough coating with excellent bonding force.High-speed, high-efficiency turning of finishing-roughing steel.
	VK4225	Yellow Black	$TiCN+Al_2O_3+$ (TiN)			A matrix with both wear resistance and chipping resistance, and a toughcoating with excellent adhesion.The first choice for Intermittent – general turning of steel.
	VK4435	Yellow Black	$TiCN+Al_2O_3+$ (TiN)			High toughness matrix, strong and tough coating with excellentbonding force, extremely high processing safetyHeavy-duty machining of steel and interrupted turning.
	NEW VK4415	Yellow Black	$TiCN+Al_2O_3+TiN$			High toughness matrix, strong and tough coating with excellent bonding strength, and extremely high processing safety.Heavy load machining and intermittent turning of steel parts.
	NEW VK4425	Yellow Black	$TiCN+Al_2O_3+TiN$			Upgraded product performance, with a matrix that combines wear resistance and blade collapse resistance, and a strong and tough coating with excellent bonding strength, the resistance to plastic deformation and crescent pit wear is improved.Longer lifespan for intermittent-general turning steel parts, also for heavy-duty machining.

The Features of PVD Coating

ISO	Grade	Colour	Coating Structure		Electron Microscopy Images	Features.Application
P Steel	VK1015	Black	AlTiN			Submicron matrix resistant to abrasive wear and a coating with higher aluminum content.Stable milling of cast iron and steel parts.
	VK1025	Black	AlTiN			The Matrix balances hardness and toughness, and the coating with higher aluminum content.Suitable for general milling of cast iron, steel, and stainless steel, with high processing safety.
	VK1825	Bronze	AlTiMeN			Ultra fine grain matrix, newly upgraded nano composite coating with high heat resistance and high toughness.Suitable for general milling of cast iron, steel, and stainless steel, with superior wear resistance,Additional grade for stainless steel turning.
M Stainless Steel	VK1820	Bronze	AlTiMeN			Medium cobalt and ultra fine grain hard alloy matrix.High hardness nano composite PVD coating.The perfect fusion of high-strength, high toughness matrix and wear-resistant surface coating, comprehensive excellent performance.
	VK1824	Bronze	AlTiMeN			Special ultra-fine grain matrix with enhanced toughness and red hardness, and the latest high wear-resistant coating.General high-performance machining for efficient milling of steel, stainless steel, and heat-resistant alloys, as well asfor stainless steel turning.
	VK1525	Purple Black	AlTiMeN			Nano multilayer coating with ultra-fine grain matrix, good wear resistance and oxidation resistance.Stable and long-life milling of steel and stainless steel.
	VK1828	Bronze	AlTiMeN			Submicron matrix, newly upgraded nano composite coating with high heat resistance and toughness.Preferred grade for stainless steel turning, supplementary machining of softer steel.
S Heat Resistant Alloy	VK1605	Bronze	AlTiSiN			Low cobalt, fine-grained wear-resistant and heat-resistant matrix.High hardness coatings deposited by high-energy pulse magnetron sputtering, with higher coating adhesion andHas good wear resistance and heat resistance.Suitable for high-temperature alloy and titanium alloy turning, continuous and stable working conditions processing;
	VR1610	Bronze	AlTiSiN			Superfine grain matrix reinforced with adhesive phase, excellent heat resistance and wear resistance.The high hardness coating deposited by HIPIMS has higher coating adhesion and good wear resistance and heat resistance.Suitable for finishing – semi-finishing turning of heat-resistant alloys and high hardness materials, and general milling.
	VR1525	Purple Black	AlTiMeN			Superfine grain matrix optimized for heat resistance and toughness of heat-resistant alloys, with wear resistance and oxidation resistance Good nano multilayer coating. The preferred grade for general machining of heat-resistant alloys.
	VR1029	Black	AlTiN			Specially reinforced super tough matrix, high aluminum coating, higher cost-effectiveness. Efficient rough milling for steam turbine blades, long-life dry cutting, and also suitable for heat resistance Alloy.

Recommended Turning Insert Grade

ISO		CVD			PVD		
K Cast Iron	01						
	10		VK3115				
	20						
	30						
	40						
P Steel	01	VK4215		VK4415			
	10						
	20	VK4225					
	30		VK4435	VK4425			
	40						
M Stainless Steel	01						
	10				Vk1820		
	20					Vk1824	Vk1525 Vk1828
	30						
	40						
S Heat Resistant Alloy	01						
	10				VK1605	VR1610	
	20					VK1824	VR1525
	30						
	40						

General Turning Insert

Item No.	Application	Chipbreaker	Feature/Shape of Insert
1	Steel Finishing	AF	P–type Material Finishing
			M–level double–sided chipbreaker, two–stage bump effect for stable chip handling in a wide range of feeds.
2	Steel Semi–finishing	AS	P–type Material Semi–finishing
			M–level double–sided chipbreaker, negative chamfer design, high edge strength, suitable for semi–finishing occasions with unstable working conditions.
3	Steel Medium machining	AM	P–type Material Medium machining
			Low cutting resistance due to double–angle cutting edge design, variable width design for sharpness and strength.
4	Steel Roughing	AG	P–type Material Roughing
			The preferred chip breaker for lightload roughing, wide margin design, good edge strength, high metal removal rate, good wear resistance and cutting life.
5	Steel Heavy–duty	AG (Single Side)	P–type Material Heavy–duty
			M–level single–sided chipbreaker, negative chamfer design, under the large cutting depth and large feed processing parameters, high edge strength and high metal removal rate can be obtained.

General Turning Insert

Item No.	Application	Chipbreaker	Feature/Shape of Insert
6	Stainless steel finishing	BF	M type material finishing
			M–level double–sided chipbreaker, small edge width + double positive rake angle, sharp blade edge, low cutting resistance, special edge inclination design, can obtain high–quality machined surface.
7	Stainless steel semi–finishing	BM	M type material semi–finishing
			M–level double–sided chipbreaker, double positive rake angle, higher edge strength , widely application for the general processing of stainless steel.
8	Stainless steel roughing	BR	M type materail roughing
			M–level double–sided chipbreaker, variable blade width and variable rake angle design,suitable for semi–finishing and roughing of stainless steel
9	High temperature alloy semi–finishing	DM	S type material semi–finishing
			M–level double–sided chipbreaker.Adopting the double positive rake angle combines the sharpness and strength of the insert;the cutting resistance is small, and the wider chipbreaker ensures enough space for chip deformation,reducing groove wear.

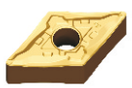
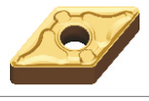
General Inner Hole Turning Insert

Item No.	Application	Chipbreaker	Feature/Shape of Insert
10	General semi–finishing	GM	General chipbreaker
			M–level single–sided chipbreaker, suitable forsemi–finishing of inner holes and outer circles of P, M and K type materials
11	Stainless steel finishing	GF	M type material finishing
			M–level single–sided chipbreaker, suitable for innerhole and outer circle finishing of stainless steel.
12	High temperature alloy semi–finishing	DM	S type material finishing
			M–level single–sided chipbreaker, suitable for innerhole and outer circle semi–finishing of S type and M type material.

Special Turning Insert

Item No.	Application	Chipbreaker	Feature/Shape of Insert
13	Train wheel hub machining	175.32 series	Chipbreaker for finishing of P type materal
			M–level double–sided chipbreaker, vertical cutting inserts, especially suitable for the trimming of train wheels.
14		RCMX series	Chipbreaker for heavy–load machining of P type material
			M–level single–sided chipbreaker, negative chamfer design,high edge strength, first choice for profiling.

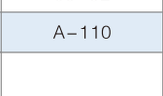
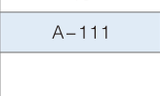
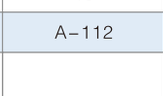
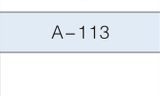
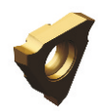
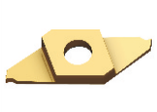
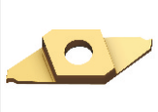
Recommendation of Inserts and Chip Breakers

Finishing						
	CNMG–AF	DNMG–AF	SNMG–AF	TNMG–AF	VNMG–AF	WNMG–AF
Length	09/12	11/15	12	16/22	16	06/08
Page	A–27	A–38	A–47	A–58	A–68	A–75
Finishing						
	CNMG–BF	DNMG–BF	SNMG–BF	TNMG–BF	VNMG–BF	WNMG–BF
Length	09/12	15	12	16	16	06/08
Page	A–32	A–42	A–52	A–62	A–71	A–79
Semi–finishing						
	CNMG–AS	CNMG–AM	CNMG–BM	CNMG–CM	CNMA	CNMG–DM
Length	12/16/19	12/16/19	12/16	12/16	12/16/19	12
Page	A–28	A–29	A–33	A–35	A–36	A–37
Semi–finishing						
	DNMG–AS	DNMG–AM	DNMG–BM	DNMG–CM	DNMG–DM	SNMG–AS
Length	15	15	15	15	15	12/15
Page	A–39	A–40	A–43	A–45	A–46	A–48
Semi–finishing						
	SNMG–AM	SNMG–BM	SNMG–CM	SNNA	SNMG–DM	TNMG–AS
Length	12/15	12/15	12/16	12/15/19	12/15	16/22
Page	A–49	A–53	A–55	A–56	A–57	A–59

Semi–finishing						
	TNMG–AM	TNMG–BM	TNMG–CM	TNMA	VNMG–AS	VNMG–AM
Length	16/22	16/22	16	16/22	11/16	11/16
Page	A–60	A–63	A–65	A–66	A–69	A–70
Semi–finishing						
	VNMG–CM	WNMG–AS	WNMG–AM			
Length	16	08	08			
Page	A–73	A–76	A–77			
Roughing						
	WNMG–BM	WNMG–CM	WNMA	WNMG–DM	CNMG–AG	CNMG–BR
Length	06/08	06/08	08	08	12/16/19	12/16
Page	A–80	A–82	A–83	A–84	A–30	A–34
Roughing						
	DNMG–AG	DNMG–BR	SNMG–AG	SNMG–BR		
Length	15	15	12/15/19	12/15		
Page	A–41	A–44	A–50	A–54		
Heavy–duty						
	TNMG–AG	TNMG–BR	WNMG–AG	WNMG–BR	CNMM–AG	
Length	16/22	16/22	06/08	06/08	19/25	
Page	A–61	A–64	A–78	A–81	A–31	

Recommendation of Inserts and Chip Breakers

Semi-finishing						
	SNMM-AG	CCMT-GM	DCMT-GM	SCMT-GM	TCMT-GM	
Length	19/25	06/09/12	07/11	09/12	09/11/16	
Page	A-51	A-85	A-87	A-89	A-91	
M Finishing						
	CCMT-GF	DCMT-GF	SCMT-GF	TCMT-GF		
Length	06、09	07、11	09	09、11、16		
Page	A-86	A-88	A-90	A-92		
NEW Small Parts Machining						
	TNGG-FS	VNGG-FS	DCGT-FS	VBGT-FS	VCGT-FS	
Length	11	16	11	11	11	
Page	A-94	A-95	A-96	A-97	A-98	
GRINDED Small Parts Machining						
	CCGT-UF	DCGT-UF	TCGT-UF	VCGT-UF		
Length	09	07、11	11	08、11		
Page	A-99	A-100	A-101	A-102		
GRINDED Small Parts Machining						
	TNGG-F	TNGG-M	TPGH			
Length	16	16	08、09、11			
Page	A-103	A-104	A-105			

High temperature alloy Semi-finishing						
	CCMT-DM	DCMT-DM	SCMT-DM	TCMT-DM		
Length	12	07、11	09	11		
Page	A-106	A-107	A-108	A-109		
Train Wheel Hub Machining						
	RCMX	175.32-22	175.32-24	175.32-28		
Length	08-32	19	19	19		
Page	A-110	A-111	A-112	A-113		
NEW Parting and Grooving						
	EDMN-C	EDMN-J	ECMN-T	ERMN-T	MGGN-GL	ERMN-M
Length	2.0-5.0	2.0-5.0	3.0-6.0	3.0-6.0	2.0-5.0	2.0-8.0
Page	A-117	A-118	A-119	A-120	A-121	A-122
GRINDED Grooving						
	TGF32R/L	GBA43R/L	TKF12R/L	TKF16R/L		
Length	1.1-3.0	1.25-3.0	0.5-2.0	1.5-2.0		
Page	A-124	A-125	A-127	A-128		

Turning Insert Code Key

1.Shape

A (85°)	B (82°)	C (80°)
D (55°)	E (75°)	H
K (55°)	L	M (86°)
O	P	R
S	T	T (75°)
V (35°)	W (80°)	Z Others

4.Chip Breaker and Hole

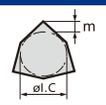
Code	Center Hole	Chip Breaker	Insert Profile	Code	Center Hole	Chip Breaker	Insert Profile
B	Y	N	>65°	N	N	N	
H	Y	Single	>65°	R	N	Single	
C	Y	N	>65°	F	N	Double	
J	Y	Double	>65°	A	Y	N	
W	Y	N	≤65°	M	Y	Single	
T	Y	Single	≤65°	G	Y	Double	
Q	Y	N	≤65°	X	---	---	Special Type
U	Y	Double	≤65°				

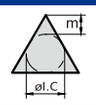
C N M G

2.Clearance Angle

Code	Clearance Angle	Code	Clearance Angle
A	3°	B	5°
C	7°	D	15°
E	20°	F	25°
G	30°	N	0°
P	11°	O	Others

3.Tolerance





Code	m(mm)	d=I.C	S (mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05-±0.13	±0.025
K	±0.013	±0.05-±0.13	±0.025
L	±0.025	±0.05-±0.13	±0.025
M	±0.08-±0.18	±0.05-±0.13	±0.13
N	±0.08-±0.18	±0.05-±0.13	±0.025
U	±0.13-±0.38	±0.08-±0.25	±0.13

Inscribed Circle	Regular Triangle	Square	80° Rhombus	55° Rhombus	35° Rhombus	
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

◆ Tolerance of Inscribed Circle(mm)

Inscribed Circle	Regular Triangle	Square	80° Rhombus	55° Rhombus	35° Rhombus	
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

5.Cutting Edge Length

Inscribed Circle diameter (mm)	C	D	R	S	T	V	W	K
32.00			32					
31.75			31	32				
25.40			25	25				
25.00	25	25	25					
20.00			20					
19.05	19		19	19	33			
16.00		19	16					
15.875	16		15	15	27			
12.70	12	15	12	12	22	22	08	
12.00			12					
10.00			10					
9.525	09	11	09	09	16	16	06	16
8.00			08					
6.35	06	07			11	11		
6.00			06					
5.56					09			
5.50			05					
3.97					06			

Insert Shape

6.Thickness

Code	Thickness(mm)
12	12.70
10	11.11
T9	9.72
09	9.52
07	7.94
T6	6.75
06	6.35
05	5.56
T4	4.96
04	4.76
T3	3.97
03	3.18
T2	2.78
02	2.38
T1	1.98
01	1.59
T0	0.99
00	0.79


12 04 12 - AS (ISO)

4 4 3 (Inch)

5.Inscribed Circle

Code	Inscribed Circle diameter(mm)
2	6.35
3	9.525
4	12.7
5	15.875
6	19.05
8	25.4

6.Thickness

Code	Thickness (mm)
2	3.18
3	4.76
4	6.35
5	7.94
6	9.52

7.Corner Radius

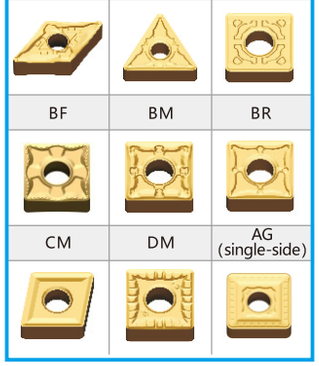
Code	Corner Radius (mm)
0	0.2
1	0.4
2	0.8
3	1.2
4	1.6
5	2.0
6	2.4

7.Corner Radius

Code	Corner Radius (mm)
00	
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	
Insert Diameter (Metric)	Circle Insert

8.Chip Breaker

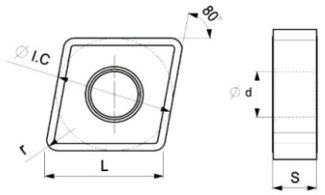
AF	AS	AG
BF	BM	BR
CM	DM	AG (single-side)



WECO CUTTING TOOLS

Turning Inserts

Negative Inserts



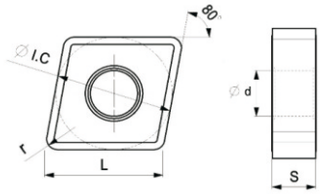
Length	Size(mm)			
	IC	S	d	r
9	9.525	3.18	3.81	0.4–0.8
12	12.7	4.76	5.16	0.4–1.2

80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
P Finishing	CNMG090304-AF	0.10–1.50	0.04–0.20				●	○								
	CNMG090308-AF	0.20–2.00	0.08–0.25				●	○								
	CNMG120404-AF	0.10–1.50	0.04–0.20				●	○								
	CNMG120408-AF	0.20–2.00	0.08–0.25				●	○								
	CNMG120412-AF	0.50–2.50	0.10–0.25				●	○								

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.6
16	15.875	6.35	6.35	0.8–1.6
19	19.05	6.35	7.94	0.8–1.6

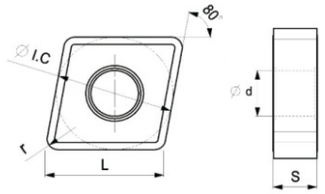
80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Semi -finishing	CNMG120404–AS	0.50–4.00	0.16–0.25				○	●	○							
	CNMG120408–AS	0.60–5.00	0.18–0.40				○	●	○							
	CNMG120412–AS	1.00–5.00	0.20–0.45				○	●	○							
	CNMG120416–AS	1.20–5.00	0.25–0.50				○	●	○							
	CNMG160608–AS	0.80–7.00	0.25–0.40				○	●	○							
	CNMG160612–AS	1.00–7.00	0.30–0.50				○	●	○							
	CNMG160616–AS	1.20–7.00	0.35–0.55				○	●	○							
	CNMG190608–AS	0.80–8.00	0.30–0.45				○	●	○							
	CNMG190612–AS	1.00–8.00	0.40–0.55				○	●	○							
	CNMG190616–AS	1.20–8.00	0.45–0.60				○	●	○							

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



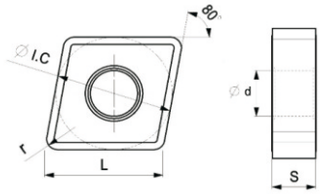
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.6
16	15.875	6.35	6.35	0.8–1.6
19	19.05	6.35	7.94	0.8–1.6

80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Medium machining	CNMG120404–AM	0.40–5.50	0.10–0.30				○	●	○							
	CNMG120408–AM	0.50–5.50	0.15–0.50				○	●	○							
	CNMG120412–AM	0.80–5.50	0.18–0.60				○	●	○							
	CNMG120416–AM	1.00–5.50	0.23–0.65				○	●	○							
	CNMG160608–AM	0.50–7.20	0.15–0.50				○	●	○							
	CNMG160612–AM	0.80–7.20	0.18–0.60				○	●	○							
	CNMG160616–AM	1.00–7.20	0.23–0.65				○	●	○							
	CNMG190608–AM	0.50–8.60	0.15–0.50				○	●	○							
	CNMG190612–AM	0.80–8.60	0.18–0.60				○	●	○							

Note: ●Recommended grade ready to stock

Negative Inserts



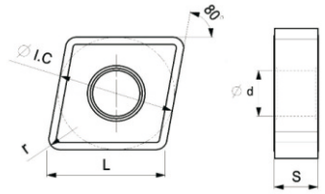
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.8–1.6
16	15.875	6.35	6.35	0.8–1.6
19	19.05	6.35	7.94	0.8–2.4

80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Roughing	CNMG120408–AG	0.80–6.00	0.20–0.40				○	●	●							
	CNMG120412–AG	1.00–6.00	0.25–0.60				○	●	●							
	CNMG120416–AG	1.60–6.00	0.35–0.70				○	●	●							
	CNMG160608–AG	1.00–8.00	0.25–0.50				○	●	●							
	CNMG160612–AG	1.20–8.00	0.35–0.65				○	●	●							
	CNMG160616–AG	1.60–8.00	0.40–0.70				○	●	●							
	CNMG190608–AG	1.00–10.00	0.25–0.50				○	●	●							
	CNMG190612–AG	1.20–10.00	0.30–0.70				○	●	●							
	CNMG190616–AG	1.60–10.00	0.35–0.80				○	●	●							
	CNMG190624–AG	2.00–10.00	0.45–1.00				○	●	●							

Note: ●Recommended grade ready to stock

Negative Inserts



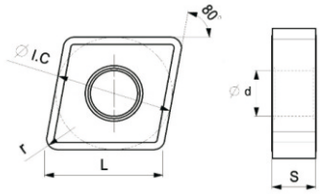
Length	Size(mm)			
	IC	S	d	r
19	19.05	6.35	7.94	1.2–2.4
25	25.4	7.94–9.52	9.12	2.4–3.2

80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Heavy -duty	CNMM190612–AG	2.00–13.00	0.50–1.00				○	●	●							
	CNMM190616–AG	2.50–13.00	0.50–1.10				○	●	●							
	CNMM190624–AG	3.00–13.00	0.60–1.60				○	●	●							
	CNMM250724–AG	3.00–17.00	0.60–1.60				○	●	●							
	CNMM250924–AG	3.00–17.00	0.60–1.60				○	●	●							
	CNMM250932–AG	3.50–17.00	0.70–2.00				○	●	●							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
9	9.525	3.18	3.81	0.4–0.8
12	12.7	4.76	5.16	0.4–1.2
16	15.875	6.35	6.35	0.8–1.6

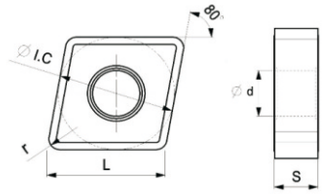
80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	CNMG090304–BF	0.20–1.50	0.05–0.15								○	●	○	●		
	CNMG090308–BF	0.40–1.50	0.07–0.20								○	●	○	●		
	CNMG120404–BF	0.20–1.50	0.05–0.15								○	●	○	●		
	CNMG120408–BF	0.40–1.50	0.07–0.20								○	●	○	●		
	CNMG120412–BF	0.50–2.00	0.10–0.25								○	●	○	●		

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



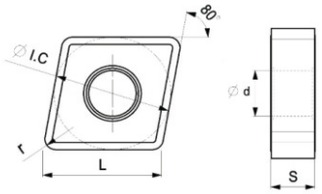
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.2
16	15.875	6.35	6.35	0.8–1.6

80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Semi-finishing	CNMG120404–BM	0.50–3.00	0.10–0.20								○	○	○	●		
	CNMG120408–BM	0.80–3.00	0.15–0.32								○	○	○	●		
	CNMG120412–BM	0.80–3.50	0.15–0.35								○	○	○	●		
	CNMG160608–BM	0.80–4.50	0.15–0.35								○	○	○	●		
	CNMG160612–BM	0.80–4.50	0.18–0.40								○	○	○	●		
	CNMG160616–BM	1.00–4.50	0.20–0.45								○	○	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.2
16	15.875	6.35	6.35	0.8–1.6

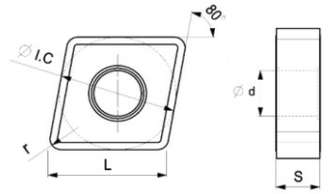
80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Roughing	CNMG120404-BR	0.80–5.00	0.15–0.35							○	○		○	●		
	CNMG120408-BR	1.20–5.00	0.20–0.40							○	○		○	●		
	CNMG120412-BR	1.50–5.00	0.25–0.50							○	○		○	●		
	CNMG160608-BR	1.20–7.00	0.22–0.45							○	○		○	●		
	CNMG160612-BR	1.50–7.00	0.25–0.60							○	○		○	●		
	CNMG160616-BR	2.00–7.00	0.30–0.65							○	○		○	●		

Note: ●Recommended grade ready to stock

A Turning Inserts

Negative Inserts



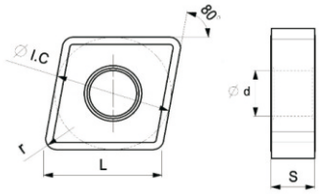
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.6
16	15.875	6.35	6.35	0.8–1.6
19	19.05	6.35	7.94	0.8–1.6

80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Semi-finishing	CNMG120404-CM	0.60–5.00	0.16–0.25			●	○	○								
	CNMG120408-CM	0.80–5.00	0.25–0.50			●	○	○								
	CNMG120412-CM	1.20–5.00	0.30–0.50			●	○	○								
	CNMG160612-CM	1.20–7.00	0.30–0.60			●	○	○								
	CNMG160616-CM	1.50–7.00	0.35–0.60			●	○	○								
	CNMG190612-CM	1.20–8.00	0.30–0.65			●	○	○								

Note: ●Recommended grade ready to stock

Negative Inserts



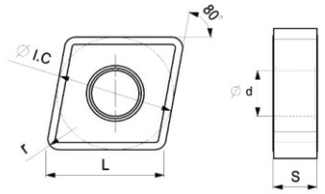
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.6
16	15.875	6.35	6.35	1.2–1.6
19	19.05	6.35	7.94	1.2–1.6

80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Roughing	CNMA120404	0.60–5.00	0.16–0.25			●	○	○								
	CNMA120408	0.80–5.00	0.25–0.50			●	○	○								
	CNMA120412	1.20–5.00	0.30–0.50			●	○	○								
	CNMA120416	1.50–5.00	0.35–0.70			●	○	○								
	CNMA160612	1.20–7.00	0.35–0.70			●	○	○								
	CNMA160616	1.50–7.00	0.35–0.80			●	○	○								
	CNMA190612	1.20–8.00	0.30–0.65			●	○	○								
	CNMA190616	1.50–8.00	0.35–0.80			●	○	○								

Note: ●Recommended grade ready to stock

Negative Inserts



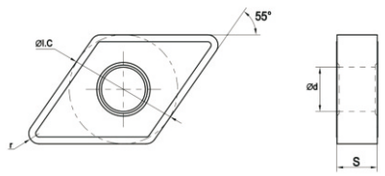
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–0.8
16	15.875	6.35	6.35	0.8–1.6
19	19.05	6.35	7.94	0.8–1.6

80° CN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD				PVD							
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 S Medium-Rough Machining	CNMG120404-DM	0.80–5.00	0.15–0.35						○			○		●	○	●
	CNMG120408-DM	1.20–5.00	0.20–0.40						○			○		●	○	●
	CNMG120412-DM	1.50–5.00	0.25–0.50						○			○		●	○	●
	CNMG120416-DM	2.00–5.00	0.30–0.55						○			○		●	○	●
	CNMG160608-DM	1.20–7.00	0.22–0.45						○			○		●	○	●
	CNMG160612-DM	1.50–7.00	0.25–0.60						○			○		●	○	●
	CNMG160616-DM	2.00–7.00	0.30–0.65						○			○		●	○	●
	CNMG190608-DM	1.20–8.00	0.22–0.45						○			○		●	○	●
	CNMG190612-DM	1.50–8.00	0.25–0.60						○			○		●	○	●
	CNMG190616-DM	2.00–8.00	0.30–0.80						○			○		●	○	●

Note: ●Recommended grade ready to stock

Negative Inserts



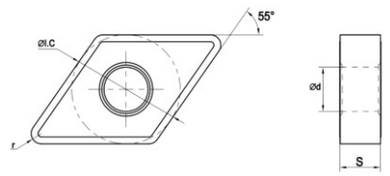
Length	Size(mm)			
	IC	S	d	r
15	12.7	4.76	5.16	0.8–1.2
15	12.7	6.35	5.16	0.4–1.2

55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Finishing	DNMG150404–AF	0.10–1.50	0.05–0.20				●	○								
	DNMG150408–AF	0.20–2.00	0.08–0.25				●	○								
	DNMG150412–AF	0.50–2.50	0.10–0.25				●	○								
	DNMG150604–AF	0.10–1.50	0.05–0.20				●	○								
	DNMG150608–AF	0.20–2.00	0.08–0.25				●	○								
	DNMG150612–AF	0.50–2.50	0.10–0.25				●	○								

Note: ●Recommended grade ready to stock

Negative Inserts



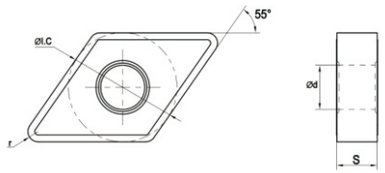
Length	Size(mm)			
	IC	S	d	r
15	12.7	4.76–6.35	5.16	0.4–1.2

55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Semi-finishing	DNMG150404–AS	0.50–4.00	0.16–0.25				○	●	○							
	DNMG150408–AS	0.60–5.00	0.18–0.35				○	●	○							
	DNMG150412–AS	1.00–5.00	0.20–0.40				○	●	○							
	DNMG150604–AS	0.50–4.00	0.16–0.25				○	●	○							
	DNMG150608–AS	0.60–5.00	0.18–0.35				○	●	○							
	DNMG150612–AS	1.00–5.00	0.20–0.40				○	●	○							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
15	12.7	4.76–6.35	5.16	0.4–1.2

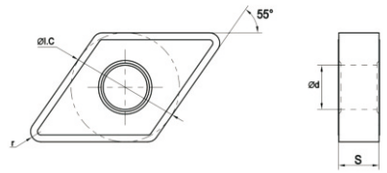
55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Medium machining	DNMG150404–AM	0.40–6.00	0.10–0.3				○	●	○							
	DNMG150408–AM	0.50–6.00	0.15–0.5				○	●	○							
	DNMG150412–AM	0.80–6.00	0.18–0.6				○	●	○							
	DNMG150604–AM	0.40–6.00	0.10–0.3				○	●	○							
	DNMG150608–AM	0.50–6.00	0.15–0.5				○	●	○							
	DNMG150612–AM	0.80–6.00	0.18–0.6				○	●	○							

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



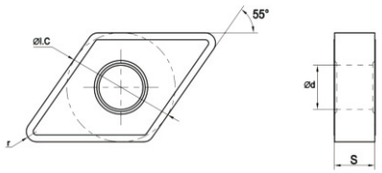
Length	Size(mm)			
	IC	S	d	r
15	12.7	4.76–6.35	5.16	0.8–1.2

55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Roughing	DNMG150408–AG	0.80–5.00	0.18–0.35				○	●	●							
	DNMG150412–AG	1.00–5.00	0.20–0.40				○	●	●							
	DNMG150608–AG	0.80–5.00	0.15–0.35				○	●	●							
	DNMG150612–AG	1.00–5.00	0.20–0.55				○	●	●							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
15	12.7	4.76–6.35	5.16	0.4–1.2

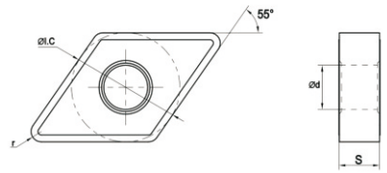
55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	DNMG150404–BF	0.20–1.50	0.05–0.15								○	●	○	●		
	DNMG150408–BF	0.40–1.50	0.07–0.20								○	●	○	●		
	DNMG150412–BF	0.50–2.00	0.10–0.25								○	●	○	●		
	DNMG150604–BF	0.20–1.50	0.05–0.15								○	●	○	●		
	DNMG150608–BF	0.40–1.50	0.07–0.20								○	●	○	●		
	DNMG150612–BF	0.50–2.00	0.10–0.25								○	●	○	●		

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



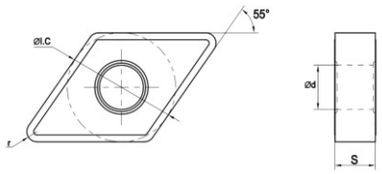
Length	Size(mm)			
	IC	S	d	r
15	12.7	4.76–6.35	5.16	0.4–1.2

55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Semi-finishing	DNMG150404–BM	0.50–2.50	0.10–0.18								○	○	○	●		
	DNMG150408–BM	0.80–3.00	0.15–0.25								○	○	○	●		
	DNMG150412–BM	0.80–3.00	0.18–0.30								○	○	○	●		
	DNMG150604–BM	0.50–2.50	0.10–0.18								○	○	○	●		
	DNMG150608–BM	0.80–3.00	0.15–0.25								○	○	○	●		
	DNMG150612–BM	0.80–3.00	0.18–0.30								○	○	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
15	12.7	4.76–6.35	5.16	0.4–1.2

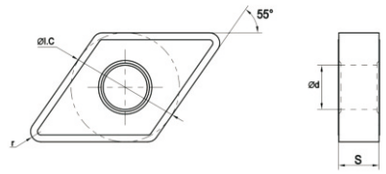
55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Roughing	DNMG150404–BR	0.80–4.00	0.15–0.35							○	○		○	●		
	DNMG150408–BR	1.20–4.00	0.20–0.40							○	○		○	●		
	DNMG150412–BR	1.50–4.00	0.25–0.50							○	○		○	●		
	DNMG150604–BR	0.80–4.00	0.15–0.35							○	○		○	●		
	DNMG150608–BR	1.20–4.00	0.20–0.40							○	○		○	●		
	DNMG150612–BR	1.50–4.00	0.25–0.50							○	○		○	●		

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



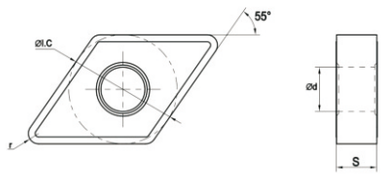
Length	Size(mm)			
	IC	S	d	r
15	12.7	6.35	5.16	0.8–1.2

55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Semi-finishing	DNMG150404–CM	0.60–5.00	0.15–0.30			●	○	○								
	DNMG150408–CM	0.80–5.00	0.20–0.45			●	○	○								
	DNMG150412–CM	1.20–5.00	0.25–0.45			●	○	○								
	DNMG150604–CM	0.60–5.00	0.15–0.30			●	○	○								
	DNMG150608–CM	0.80–5.00	0.25–0.45			●	○	○								
	DNMG150612–CM	1.20–5.00	0.30–0.45			●	○	○								

Note: ●Recommended grade ready to stock

Negative Inserts



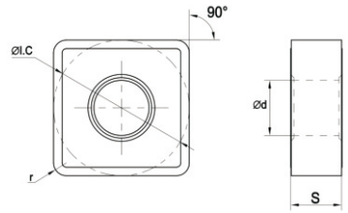
Length	Size(mm)			
	IC	S	d	r
15	12.7	4.76–6.35	5.16	0.4–1.2

55° DN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD				PVD								
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 S Medium-Rough Machining	DNMG150404–DM	0.80–4.00	0.15–0.35						○			○		●	○	●
	DNMG150408–DM	1.20–4.00	0.20–0.40						○			○		●	○	●
	DNMG150412–DM	1.50–4.00	0.25–0.50						○			○		●	○	●
	DNMG150604–DM	0.80–4.00	0.15–0.35						○			○		●	○	●
	DNMG150608–DM	1.20–4.00	0.20–0.40						○			○		●	○	●
	DNMG150612–DM	1.50–4.00	0.25–0.50						○			○		●	○	●

Note: ●Recommended grade ready to stock

Negative Inserts



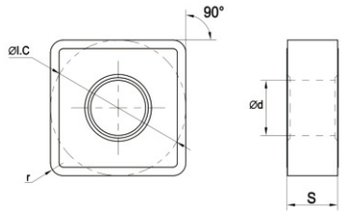
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.8–1.2

90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Finishing	SNMG120404–AF	0.10–1.80	0.04–0.22				●	○								
	SNMG120408–AF	0.20–2.00	0.08–0.25				●	○								
	SNMG120412–AF	0.50–2.50	0.10–0.25				●	○								

Note: ●Recommended grade ready to stock

Negative Inserts



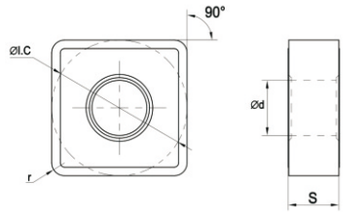
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.8–1.6
15	15.875	6.35	6.35	0.8–1.2

90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Semi-finishing	SNMG120404–AS	0.50–4.00	0.16–0.25				○	●	○							
	SNMG120408–AS	0.60–5.00	0.18–0.40				○	●	○							
	SNMG120412–AS	1.00–5.00	0.20–0.45				○	●	○							
	SNMG150612–AS	1.00–8.00	0.30–0.50				○	●	○							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.8–1.6
15	15.875	6.35	6.35	0.8–1.2

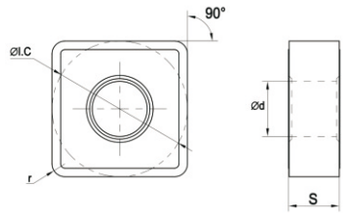
90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Medium machining	SNMG120404–AM	0.40–6.00	0.10–0.3				○	●	○							
	SNMG120408–AM	0.50–6.00	0.15–0.5				○	●	○							
	SNMG120412–AM	0.80–6.00	0.18–0.6				○	●	○							
	SNMG150612–AM	0.80–7.50	0.18–0.6				○	●	○							

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



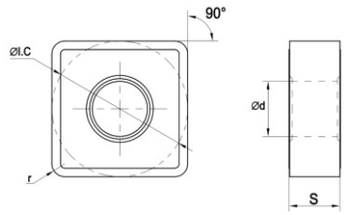
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.8–1.6
15	15.875	6.35	6.35	0.8–1.2
19	19.05	6.35	7.94	1.2–1.6

90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Roughing	SNMG120408–AG	0.80–6.00	0.20–0.55				○	●	●							
	SNMG120412–AG	1.00–6.00	0.25–0.65				○	●	●							
	SNMG120416–AG	1.60–6.00	0.35–0.75				○	●	●							
	SNMG150612–AG	1.20–8.00	0.25–0.70				○	●	●							
	SNMG190612–AG	1.20–10.00	0.30–0.70				○	●	●							
	SNMG190616–AG	1.60–10.00	0.35–0.80				○	●	●							

Note: ●Recommended grade ready to stock

Negative Inserts



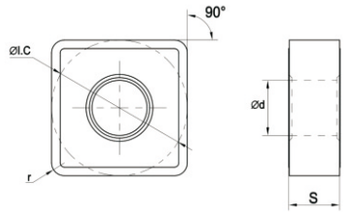
Length	Size(mm)			
	IC	S	d	r
19	19.05	6.35	7.94	1.2–2.4
25	25.4	7.94–9.52	9.12	2.4–3.2

90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Heavy-duty	SNMM190612–AG	2.00–13.00	0.50–1.00				○	●	●							
	SNMM190616–AG	2.50–13.00	0.50–1.10				○	●	●							
	SNMM190624–AG	3.00–13.00	0.60–1.60				○	●	●							
	SNMM250724–AG	3.00–17.00	0.60–1.60				○	●	●							
	SNMM250732–AG	3.50–17.00	0.70–2.00				○	●	●							
	SNMM250924–AG	3.00–17.00	0.60–1.60				○	●	●							
	SNMM250932–AG	3.50–17.00	0.70–2.00				○	●	●							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.2

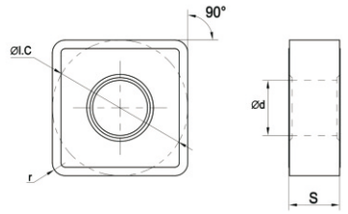
90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	SNMG120404–BF	0.20–1.50	0.05–0.15								○	●	○	●		
	SNMG120408–BF	0.40–1.50	0.07–0.20								○	●	○	●		
	SNMG120412–BF	0.50–2.00	0.10–0.25								○	●	○	●		

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



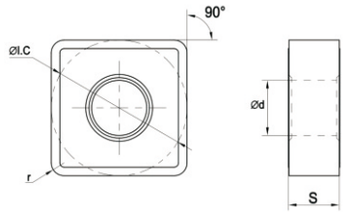
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.2
15	15.875	6.35	6.35	0.8–1.2

90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Semi-finishing	SNMG120404–BM	0.50–2.00	0.10–0.18								○	○	○	●		
	SNMG120408–BM	0.80–3.00	0.15–0.25								○	○	○	●		
	SNMG120412–BM	0.80–3.50	0.18–0.30								○	○	○	●		
	SNMG150608–BM	0.80–4.50	0.15–0.35								○	○	○	●		
	SNMG150612–BM	0.80–4.50	0.18–0.40								○	○	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.2
15	15.875	6.35	6.35	0.8–1.2

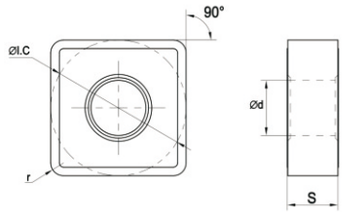
90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Roughing	SNMG120404–BR	0.80–5.00	0.15–0.35							○	○		○	●		
	SNMG120408–BR	1.20–5.00	0.20–0.40							○	○		○	●		
	SNMG120412–BR	1.50–5.00	0.25–0.50							○	○		○	●		
	SNMG150608–BR	1.20–7.00	0.20–0.50							○	○		○	●		
	SNMG150612–BR	1.50–7.00	0.25–0.60							○	○		○	●		

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



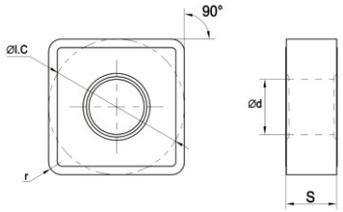
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.6
15	15.875	6.35	6.35	0.8–1.6
19	19.05	6.35	7.94	1.2–1.6

90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Semi-finishing	SNMG120404–CM	0.60–5.00	0.16–0.25			●	○	○								
	SNMG120408–CM	0.80–5.00	0.25–0.50			●	○	○								
	SNMG120412–CM	1.20–5.00	0.30–0.50			●	○	○								

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	RE
12	12.7	4.76	5.16	0.4–1.6
15	15.875	6.35	6.35	1.2–1.6
19	19.05	6.35	7.94	1.2–1.6

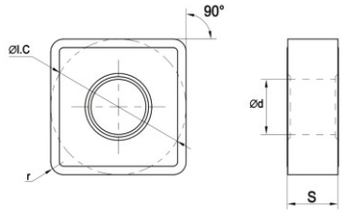
90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Roughing	SNMA120404	0.60–5.00	0.16–0.25			●	○	○								
	SNMA120408	0.80–5.00	0.25–0.50			●	○	○								
	SNMA120412	1.20–5.00	0.30–0.60			●	○	○								
	SNMA120416	1.50–5.00	0.35–0.70			●	○	○								
	SNMA150612	1.20–7.00	0.30–0.65			●	○	○								
	SNMA150616	1.50–7.00	0.35–0.80			●	○	○								
	SNMA190612	1.20–8.00	0.30–0.65			●	○	○								
	SNMA190616	1.50–8.00	0.35–0.80			●	○	○								

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



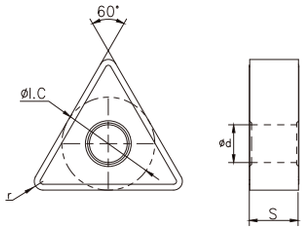
Length	Size(mm)			
	IC	S	d	r
12	12.7	4.76	5.16	0.4–1.6
15	15.875	6.35	6.35	0.8–1.6

90° SN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD				PVD								
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 S Medium-Rough Machining	SNMG120404–DM	0.80–5.00	0.15–0.35						○			○		●	○	●
	SNMG120408–DM	1.20–5.00	0.20–0.40						○			○		●	○	●
	SNMG120412–DM	1.50–5.00	0.25–0.50						○			○		●	○	●
	SNMG120416–DM	2.00–5.00	0.30–0.55						○			○		●	○	●
	SNMG150608–DM	1.20–7.00	0.20–0.50						○			○		●	○	●
	SNMG150612–DM	1.50–7.00	0.25–0.60						○			○		●	○	●
	SNMG150616–DM	2.00–7.00	0.30–0.65						○			○		●	○	●

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2

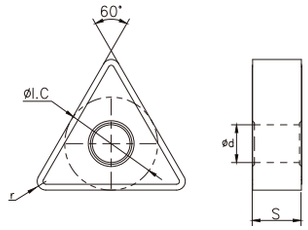
60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
P Finishing	TNMG160404–AF	0.10–1.50	0.04–0.20				●	○								
	TNMG160408–AF	0.20–2.00	0.08–0.25				●	○								
	TNMG160412–AF	0.50–2.50	0.10–0.25				●	○								

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



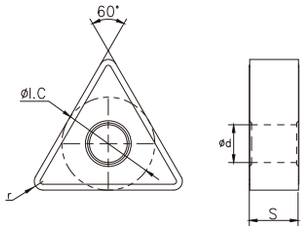
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2
22	12.7	4.76	5.16	0.8–1.6

60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
P Semi-finishing	TNMG160404–AS	0.50–4.00	0.16–0.25				○	●	○							
	TNMG160408–AS	0.60–4.00	0.18–0.35				○	●	○							
	TNMG160412–AS	1.00–4.00	0.20–0.40				○	●	○							
	TNMG220408–AS	0.80–5.00	0.18–0.35				○	●	○							
	TNMG220412–AS	1.00–5.00	0.20–0.40				○	●	○							
	TNMG220416–AS	1.20–5.00	0.25–0.45				○	●	○							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2
22	12.7	4.76	5.16	0.8–1.6

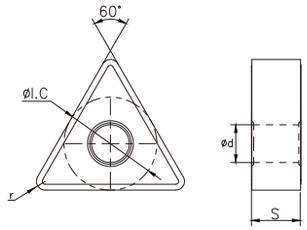
60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Medium machining	TNMG160404–AM	0.40–5.00	0.10–0.30				○	●	○							
	TNMG160408–AM	0.50–5.00	0.15–0.50				○	●	○							
	TNMG160412–AM	0.80–5.00	0.18–0.60				○	●	○							
	TNMG220408–AM	0.50–6.60	0.15–0.50				○	●	○							
	TNMG220412–AM	0.80–6.60	0.18–0.60				○	●	○							
	TNMG220416–AM	1.00–6.00	0.23–0.65				○	●	○							

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



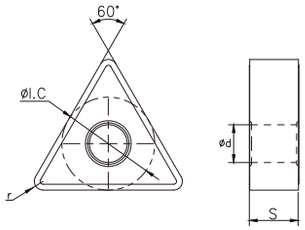
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.8–1.2
22	12.7	4.76	5.16	0.8–1.6

60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Roughing	TNMG160408–AG	0.80–5.00	0.20–0.40				○	●	●							
	TNMG220408–AG	0.80–7.00	0.20–0.45				○	●	●							
	TNMG220412–AG	1.00–7.00	0.25–0.60				○	●	●							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2

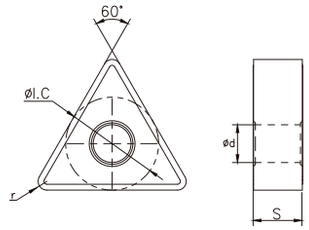
60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	TNMG160404–BF	0.20–1.00	0.05–0.15								○	●	○	●		
	TNMG160408–BF	0.40–1.50	0.07–0.20								○	●	○	●		
	TNMG160412–BF	0.50–2.00	0.10–0.25								○	●	○	●		

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



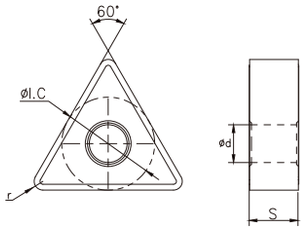
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2
22	12.7	4.76	5.16	0.8–1.6

60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Semi-finishing	TNMG160404–BM	0.50–2.00	0.10–0.18								○	○	○	●		
	TNMG160408–BM	0.80–3.00	0.15–0.25								○	○	○	●		
	TNMG160412–BM	0.80–3.50	0.18–0.30								○	○	○	●		
	TNMG220408–BM	0.80–3.50	0.15–0.25								○	○	○	●		
	TNMG220412–BM	0.80–4.00	0.18–0.30								○	○	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2
22	12.7	4.76	5.16	0.8–1.2

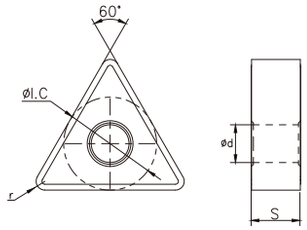
60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Semi-finishing	TNMG160404-BR	0.80–4.00	0.15–0.35							○	○		○	●		
	TNMG160408-BR	1.20–4.00	0.20–0.40							○	○		○	●		
	TNMG160412-BR	1.50–4.00	0.25–0.50							○	○		○	●		
	TNMG220408-BR	0.20–5.00	0.20–0.40							○	○		○	●		
	TNMG220412-BR	1.50–5.00	0.25–0.55							○	○		○	●		

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



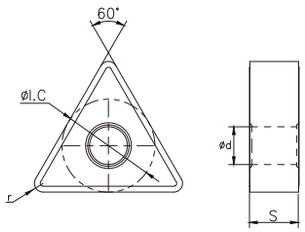
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2
22	12.7	4.76	5.16	0.8–1.6

60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Semi-finishing	TNMG160404-CM	0.60–4.00	0.16–0.25			●	○	○								
	TNMG160408-CM	0.80–5.00	0.25–0.45			●	○	○								
	TNMG160412-CM	1.20–5.00	0.30–0.45			●	○	○								
	TNMG220412-CM	1.40–6.00	0.30–0.45			●	○	○								

Note: ●Recommended grade ready to stock

Negative Inserts



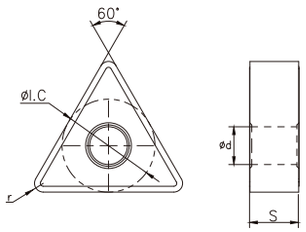
Length	Size(mm)			
	IC	S	d	RE
16	9.525	4.76	3.81	0.4–1.2
22	12.7	4.76	5.16	0.8–1.6

60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Roughing	TNMA160404	0.60–5.00	0.16–0.25			●	○	○								
	TNMA160408	0.80–5.00	0.25–0.45			●	○	○								
	TNMA160412	1.20–5.00	0.30–0.50			●	○	○								
	TNMA160416	1.50–5.00	0.35–0.60			●	○	○								
	TNMA220408	1.00–6.00	0.25–0.45			●	○	○								
	TNMA220412	1.40–6.00	0.35–0.55			●	○	○								
	TNMA220416	1.60–6.00	0.35–0.60			●	○	○								

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–0.8

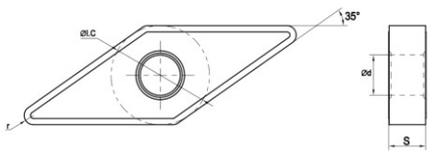
60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Semi-finishing	TNMG160404-DM	0.80–4.00	0.15–0.35								○			●	○	●
	TNMG160408-DM	1.20–4.00	0.20–0.40								○			●	○	●

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



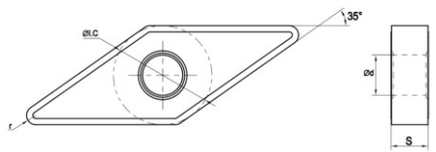
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2

35° VN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Finishing	VNMG160404–AF	0.10–1.50	0.04–0.00				●	○								
	VNMG160408–AF	0.20–2.00	0.08–0.25				●	○								
	VNMG160412–AF	0.30–2.50	0.12–0.28				●	○								

Note: ●Recommended grade ready to stock

Negative Inserts



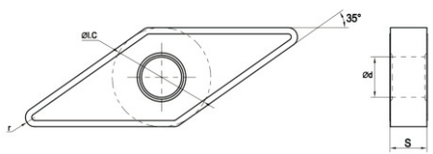
Length	Size(mm)			
	IC	S	d	r
11	6.35	4.76	2.26	0.4–0.8
16	9.525	4.76	3.81	0.4–0.8

35° VN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Semi-finishing	VNMG110404–AS	0.40–1.50	0.10–0.18				○	●	○							
	VNMG110408–AS	0.50–2.50	0.18–0.35				○	●	○							
	VNMG160404–AS	0.50–2.00	0.10–0.18				○	●	○							
	VNMG160408–AS	0.60–4.00	0.18–0.35				○	●	○							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
11	6.35	4.76	2.26	0.4–0.8
16	9.525	4.76	3.81	0.4–0.8

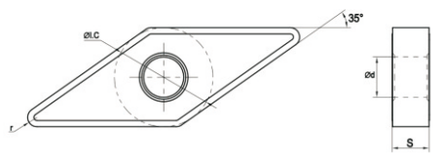
35° VN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Medium machining	VNMG160408–AM	0.50–4.00	0.15–0.5				○	●	○							
	VNMG160412–AM	0.80–4.00	0.18–0.6				○	●	○							

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



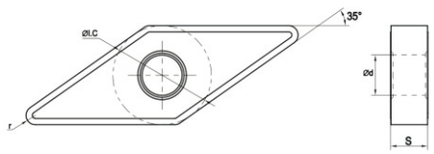
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2

35° VN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	VNMG160404–BF	0.10–1.00	0.05–0.15								○	●	○	●		
	VNMG160408–BF	0.40–1.50	0.07–0.20								○	●	○	●		
	VNMG160412–BF	0.50–2.00	0.10–0.25								○	●	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–0.8

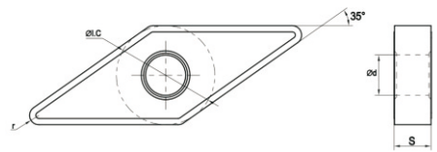
35° VN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	VNMG160404–BM	0.50–2.00	0.10–0.18								○	○	○	●		
	VNMG160408–BM	0.80–3.00	0.15–0.25								○	○	○	●		

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



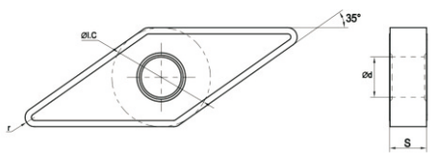
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–1.2

35° VN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 K Semi-finishing	VNMG160404–CM	0.60–4.00	0.16–0.25			●	○	○								
	VNMG160408–CM	0.80–4.00	0.18–0.35			●	○	○								
	VNMG160412–CM	1.00–4.00	0.20–0.35			●	○	○								

Note: ●Recommended grade ready to stock

Negative Inserts



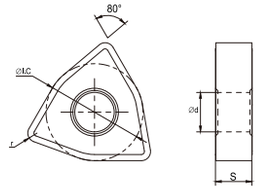
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.4–0.8

35° VN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	VNMG160404–DM	0.15–2.00	0.05–0.20								○	○	○	●		
	VNMG160408–DM	0.20–2.50	0.07–0.23								○	○	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



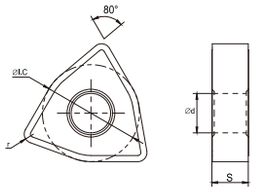
Length	Size(mm)			
	IC	S	d	r
8	12.7	4.76	5.16	0.4–1.2

80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Finishing	WNMG080404–AF	0.10–1.50	0.05–0.20				●	○								
	WNMG080408–AF	0.20–2.00	0.08–0.25				●	○								
	WNMG080412–AF	0.50–2.50	0.10–0.25				●	○								

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
8	12.7	4.76	5.16	0.4–1.6

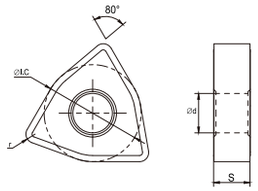
80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
P Semi-finishing	WNMG080404–AS	0.50–4.00	0.16–0.25				○	●	○							
	WNMG080408–AS	0.60–5.00	0.18–0.40				○	●	○							
	WNMG080412–AS	1.00–5.00	0.20–0.45				○	●	○							
	WNMG080416–AS	1.20–5.00	0.25–0.50				○	●	○							

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



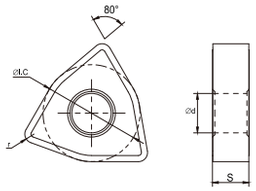
Length	Size(mm)			
	IC	S	d	r
8	12.7	4.76	5.16	0.4–1.6

80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
P Medium machining	WNMG080404–AM	0.40–4.00	0.10–0.30				○	●	○							
	WNMG080408–AM	0.50–4.00	0.15–0.50				○	●	○							
	WNMG080412–AM	0.80–4.00	0.18–0.60				○	●	○							
	WNMG080416–AM	1.00–4.00	0.23–0.65				○	●	○							

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
6	9.525	4.76	3.81	0.8–1.2
8	12.7	4.76	5.16	0.8–1.2

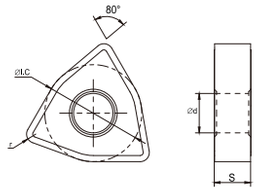
80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 P Roughing	WNMG060408-AG	0.80–4.00	0.20–0.40				○	●	●							
	WNMG060412-AG	1.00–4.00	0.25–0.50				○	●	●							
	WNMG080408-AG	0.80–6.00	0.20–0.40				○	●	●							
	WNMG080412-AG	1.00–6.00	0.25–0.60				○	●	●							

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



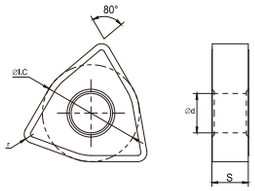
Length	Size(mm)			
	IC	S	d	r
6	9.525	4.76	3.81	0.4–0.8
8	12.7	4.76	5.16	0.4–1.6

80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	WNMG060404-BF	0.20–1.00	0.05–0.15								○	●	○	●		
	WNMG060408-BF	0.40–1.50	0.07–0.20								○	●	○	●		
	WNMG080404-BF	0.20–1.50	0.05–0.15								○	●	○	●		
	WNMG080408-BF	0.40–1.50	0.07–0.20								○	●	○	●		
	WNMG080412-BF	0.50–2.00	0.10–0.25								○	●	○	●		
	WNMG080416-BF	0.60–2.00	0.15–0.30								○	●	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
6	9.525	4.76	3.81	0.4–0.8
8	12.7	4.76	5.16	0.4–1.6

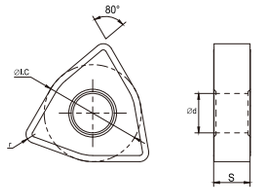
80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Semi-finishing	WNMG060404–BM	0.50–2.00	0.10–0.18								○	○	○	●		
	WNMG060408–BM	0.80–2.50	0.15–0.25								○	○	○	●		
	WNMG080404–BM	0.50–3.00	0.10–0.20								○	○	○	●		
	WNMG080408–BM	0.80–3.00	0.15–0.32								○	○	○	●		
	WNMG080412–BM	0.80–3.50	0.15–0.35								○	○	○	●		
	WNMG080416–BM	1.00–4.00	0.15–0.40								○	○	○	●		

Note: ●Recommended grade ready to stock

A Turning Inserts

Negative Inserts



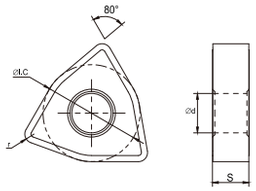
Length	Size(mm)			
	IC	S	d	r
6	9.525	4.76	3.81	0.4–0.8
8	12.7	4.76	5.16	0.4–1.6

80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Roughing	WNMG060404–BR	0.80–3.50	0.15–0.35							○	○		○	●		
	WNMG060408–BR	1.20–3.50	0.20–0.40							○	○		○	●		
	WNMG080404–BR	0.80–4.50	0.15–0.35							○	○		○	●		
	WNMG080408–BR	1.20–4.50	0.20–0.40							○	○		○	●		
	WNMG080412–BR	1.50–4.50	0.25–0.50							○	○		○	●		
	WNMG080416–BR	2.00–4.50	0.30–0.55							○	○		○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
8	12.7	4.76	5.16	0.4–1.6

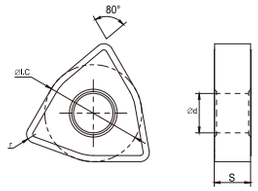
80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
K Semi-finishing	WNMG080404-CM	0.60–5.00	0.16–0.25			●	○	○								
	WNMG080408-CM	1.20–5.00	0.20–0.45			●	○	○								
	WNMG080412-CM	1.50–5.00	0.22–0.50			●	○	○								

Note: ●Recommended grade ready to stock

A Turning Insert

Negative Inserts



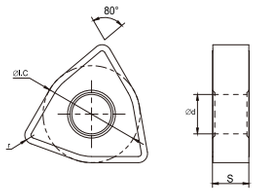
Length	Size(mm)			
	IC	S	d	RE
8	12.7	4.76	5.16	0.4–1.6

80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
K Roughing	WNMA080404	0.60–5.00	0.16–0.25			●	○	○								
	WNMA080408	1.20–5.00	0.20–0.45			●	○	○								
	WNMA080412	1.50–5.00	0.22–0.50			●	○	○								
	WNMA080416	1.50–5.00	0.25–0.60			●	○	○								

Note: ●Recommended grade ready to stock

Negative Inserts



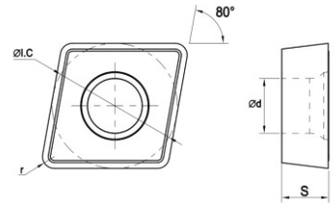
Length	Size(mm)			
	IC	S	d	r
8	12.7	4.76	5.16	0.4–1.6

80° WN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD				PVD								
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 S Semi-finishing	WNMG080404–DM	0.80–4.50	0.15–0.35						○			○		●	○	●
	WNMG080408–DM	1.20–4.50	0.20–0.40						○			○		●	○	●
	WNMG080412–DM	1.50–4.50	0.25–0.50						○			○		●	○	●
	WNMG080416–DM	2.00–4.50	0.30–0.55						○			○		●	○	●

Note: ●Recommended grade ready to stock

Negative Inserts



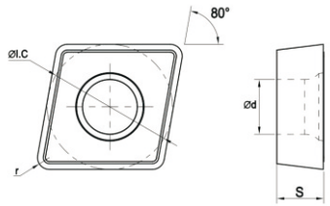
Length	Size(mm)			
	IC	S	d	r
6	3.65	2.38	2.8	0.4–0.8
9	9.525	3.97	4.4	0.4–0.8
12	12.7	4.76	5.56	0.4–1.2

80° CC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD				PVD								
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 General Semi-finishing	CCMT060204–GM	0.40–2.50	0.10–0.20		●	●		○		●		○				○
	CCMT060208–GM	0.50–2.50	0.10–0.25		●	●		○		●		○				○
	CCMT09T304–GM	0.40–3.00	0.08–0.25		●	●		○		●		○				○
	CCMT09T308–GM	0.50–3.00	0.12–0.32		●	●		○		●		○				○
	CCMT120404–GM	0.50–4.00	0.12–0.32.		●	●		○		●		○				○
	CCMT120408–GM	0.60–4.00	0.15–0.35		●	●		○		●		○				○
	CCMT120412–GM	0.80–4.00	0.20–0.40		●	●		○		●		○				○

Note: ●Recommended grade ready to stock

Negative Inserts



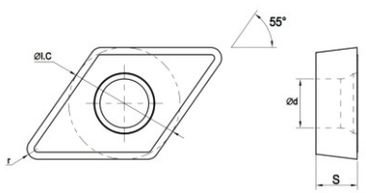
Length	Size(mm)			
	IC	S	d	r
6	3.65	2.38	2.8	0.4–0.8
9	9.525	3.97	4.4	0.4–0.8

80° CC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	CCMT060202-GF	0.10–1.00	0.04–0.12								○	●	○	●		
	CCMT060204-GF	0.10–1.50	0.05–0.16								○	●	○	●		
	CCMT060208-GF	0.10–1.50	0.08–0.20								○	●	○	●		
	CCMT09T302-GF	0.10–1.00	0.04–0.12								○	●	○	●		
	CCMT09T304-GF	0.10–1.50	0.05–0.16								○	●	○	●		
	CCMT09T308-GF	0.10–1.50	0.08–0.20								○	●	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



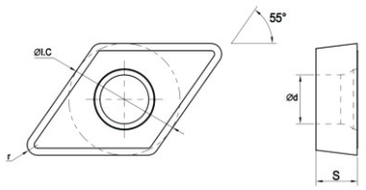
Length	Size(mm)			
	IC	S	d	r
7	6.35	2.38	2.8	0.4–0.8
11	9.525	3.97	4.4	0.4–1.2

55° DC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD				PVD							
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 General Semi-finishing	DCMT070204-GM	0.40–2.50	0.10–0.20		●	●		○		●		○				○
	DCMT070208-GM	0.60–2.50	0.15–0.25		●	●		○		●		○				○
	DCMT11T304-GM	0.40–3.50	0.10–0.25		●	●		○		●		○				○
	DCMT11T308-GM	0.60–3.50	0.15–0.32		●	●		○		●		○				○
	DCMT11T312-GM	0.60–3.50	0.18–0.35		●	●		○		●		○				○

Note: ●Recommended grade ready to stock

Negative Inserts



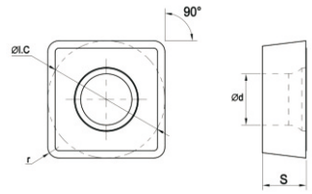
Length	Size(mm)			
	IC	S	d	r
7	6.35	2.38	2.8	0.4–0.8
11	9.525	3.97	4.4	0.4–1.2

55° DC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	DCMT070204-GF	0.10–1.50	0.05–0.16								○	●	○	●		
	DCMT070208-GF	0.10–1.50	0.08–0.20								○	●	○	●		
	DCMT11T304-GF	0.10–1.50	0.05–0.16								○	●	○	●		
	DCMT11T308-GF	0.10–1.50	0.08–0.20								○	●	○	●		
	DCMT11T312-GF	0.10–1.50	0.10–0.25								○	●	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



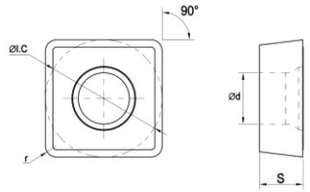
Length	Size(mm)			
	IC	S	d	r
9	9.525	3.97	4.4	0.4–0.8
12	12.7	4.76	5.56	0.4–1.2

90° SC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade														
				CVD				PVD										
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525		
 General Semi-finishing	SCMT09T304-GM	0.40–3.00	0.08–0.25		●	●		○		●		○				○		
	SCMT09T308-GM	0.50–3.00	0.12–0.32		●	●		○		●		○				○		
	SCMT120404-GM	0.50–4.00	0.12–0.32		●	●		○		●		○				○		
	SCMT120408-GM	0.60–4.00	0.15–0.35		●	●		○		●		○				○		
	SCMT120412-GM	0.80–4.00	0.20–0.40		●	●		○		●		○				○		

Note: ●Recommended grade ready to stock

Negative Inserts



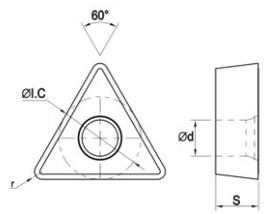
Length	Size(mm)			
	IC	S	d	r
9	9.525	3.97	4.4	0.4–0.8

90° SC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 M Finishing	SCMT09T304-GF	0.10–1.50	0.05–0.15								○	●	○	●		
	SCMT09T308-GF	0.10–1.80	0.05–0.18								○	●	○	●		

Note: ●Recommended grade ready to stock

Negative Inserts



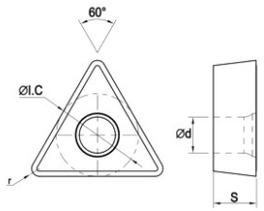
Length	Size(mm)			
	IC	S	d	r
9	5.56	2.38	2.2	0.4–0.8
11	6.35	2.38	2.8	0.4–1.2
16	9.525	3.97	4.4	0.4–1.2

60° TC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade														
				CVD				PVD										
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525		
 Gereral Semi-finishing	TCMT090204-GM	0.40–2.50	0.10–0.20		●	●		○		●		○				○		
	TCMT090208-GM	0.60–2.50	0.10–0.25		●	●		○		●		○				○		
	TCMT110204-GM	0.40–2.50	0.10–0.20		●	●		○		●		○				○		
	TCMT110208-GM	0.60–2.50	0.10–0.25		●	●		○		●		○				○		
	TCMT110212-GM	0.60–2.50	0.15–0.32		●	●		○		●		○				○		
	TCMT16T304-GM	0.40–3.50	0.10–0.25		●	●		○		●		○				○		
	TCMT16T308-GM	0.60–3.50	0.15–0.32		●	●		○		●		○				○		
	TCMT16T312-GM	0.60–3.50	0.20–0.40		●	●		○		●		○				○		

Note: ●Recommended grade ready to stock

Negative Inserts



Length	Size(mm)			
	IC	S	d	r
9	5.56	2.38	2.2	0.4–0.8
11	6.35	2.38	2.8	0.4–1.2
16	9.525	3.97	4.4	0.4–1.2

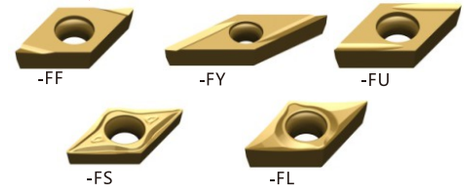
60° TC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
M Finishing	TCMT090204-GF	0.10–1.50	0.05–0.16								○	●	○	●		
	TCMT090208-GF	0.10–1.50	0.08–0.20								○	●	○	●		
	TCMT110204-GF	0.10–1.50	0.05–0.16								○	●	○	●		
	TCMT110208-GF	0.10–1.50	0.08–0.20								○	●	○	●		
	TCMT110212-GF	0.10–1.50	0.10–0.25								○	●	○	●		
	TCMT16T304-GF	0.10–1.50	0.05–0.16								○	●	○	●		
	TCMT16T308-GF	0.10–1.50	0.08–0.20								○	●	○	●		
	TCMT16T312-GF	0.10–1.50	0.10–0.25								○	●	○	●		

Note: ●Recommended grade ready to stock

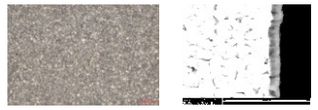
Precision Parts Machining

New Series of Products



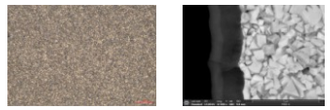
The Intro of PVD Grades

VK1805 ISO:P05-P15 M05-M15 S05-S15



- Utilizing medium-cobalt, fine-grained carbide matrix that offers excellent wear resistance and toughness.
- Combined with PVD nano high-performance composite coating and low surface friction series, effectively inhibits the formation of chip tumors, delivering outstanding overall performance.
  1. General turning grade for precision parts.
  2. Recommended for turning P and M type materials.
  3. Suitable for medium to high cutting speed machining.

VK1820 ISO:P10-P30 M10-M30



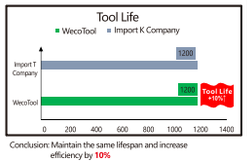
- Utilizing medium-cobalt, fine-grained carbide matrix that offers excellent wear resistance and toughness.
- Combined with PVD nano high-performance composite coating and low surface friction series, effectively inhibits the formation of chip tumors, delivering outstanding overall performance.
  1. General turning grade for precision parts.
  2. Recommended for turning P and M type materials.
  3. Suitable for medium to high cutting speed machining.

The Application of CVD Grades

Workpiece	P	M	S
Application	Wearness ⟷ Toughness	Wearness ⟷ Toughness	Wearness ⟷ Toughness
ISO	01 10 20 30 40 50	01 10 20 30 40 50	01 10 20 30 40 50
PVD Grades	VK1805, VK1820	VK1805, VK1820	VK1805, VK1820

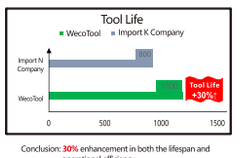
Case

Info.	Import K Company	WecoTool
Lathe	Tsugami 205	
Workpiece material	Austenitic stainless steel 304	
Hardness	180-210	
Workpiece	Bearing	
Processing type	External processing	
Cutter	SDLNL1212-11	
Insert	DCGT11T302-S* P#30	DCGT11T302-FS VK1820
Cutting Parameter		
Vc(m/min)	38-50	40-55
f(mm/rev)	0.1	0.1
ap(mm)	0.3	0.3
Cooling Type	External cooling emulsion	
Test Result		
pcs/edge	1200	1200
Processing Time(min)	abrasive wear	abrasive wear
VB(mm)	0.31	0.12



Conclusion: Maintain the same lifespan and increase efficiency by 10%

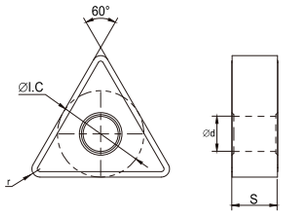
Info.	Import N Company	WecoTool
Lathe	Citizen L12	
Workpiece material	SUS202	
Hardness	200-240	
Workpiece	Shaft head	
Processing type	External processing	
Cutter	SDLNL1212-11	
Insert	DCGT11T302-C* P#25	DCGT11T302-FL VK1805
Cutting Parameter		
Vc(m/min)	60	80
f(mm/rev)	0.12	0.12
ap(mm)	0.3	0.3
Cooling Type	External cooling emulsion	
Test Result		
pcs/edge	800	1000
Processing Time(min)	abrasive wear	abrasive wear
VB(mm)	0.13	0.13



Conclusion: 30% enhancement in both the lifespan and operational efficiency.

Processing Sword for CNC Precision Automatic Lathe--
High Precision and High-quality Guarantee

Negative Inserts



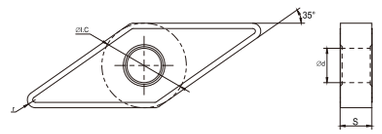
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.1–0.4

60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	TNGG160401–FS	0.4–1.5	0.02–0.06							○	●	●	○			
	TNGG160402–FS	0.6–2.0	0.04–0.08							○	●	●	○			
	TNGG160404–FS	0.8–2.5	0.06–0.10							○	●	●	○			

Note: ●Recommended grade ready to stock

Negative Inserts



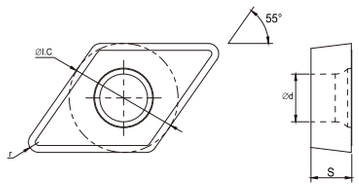
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.2–0.8

35° VN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	VNGG160402–FS	0.4–2.0	0.02–0.06							○	●	●	○			
	VNGG160404–FS	0.8–2.5	0.04–0.08							○	●	●	○			
	VNGG160408–FS	1.0–3.0	0.06–0.12							○	●	●	○			

Note: ●Recommended grade ready to stock

Positive Inserts



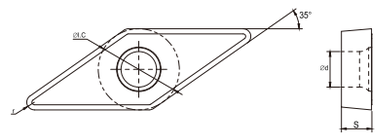
Length	Size(mm)			
	IC	S	d	r
9	6.35	3.97	4.4	0.1–0.8

55° DC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	DCGT11T301–FS	0.10–1.50	0.02–0.06							○	●	●	○			
	DCGT11T302–FS	0.20–2.00	0.05–0.12							○	●	●	○			
	DCGT11T304–FS	0.20–2.50	0.08–0.25							○	●	●	○			
	DCGT11T308–FS	0.30–3.00	0.10–0.30							○	●	●	○			

Note: ●Recommended grade ready to stock

Positive Inserts



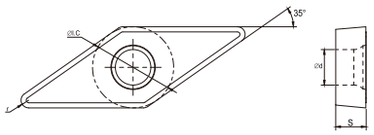
Length	Size(mm)			
	IC	S	d	r
11	6.35	3.18	2.81	0.1–0.4

35° VB□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	VBGT110301–FS	0.1–1.5	0.02–0.06							○	●	●	○			
	VBGT110302–FS	0.2–2.0	0.05–0.12							○	●	●	○			
	VBGT110304–FS	0.2–2.5	0.08–0.25							○	●	●	○			

Note: ●Recommended grade ready to stock

Positive Inserts



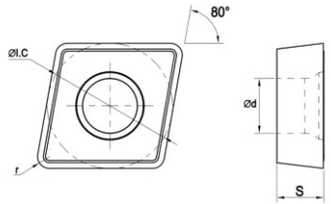
Length	Size(mm)			
	IC	S	d	r
11	6.35	3.18	2.81	0.1–0.4

35° VC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	VCGT110301–FS	0.1–1.5	0.02–0.06							○	●	●	○			
	VCGT110302–FS	0.2–2.0	0.05–0.12							○	●	●	○			
	VCGT110304–FS	0.2–2.5	0.08–0.25							○	●	●	○			

Note: ●Recommended grade ready to stock

Positive Inserts



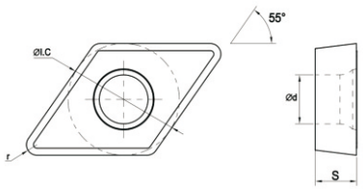
Length	Size(mm)			
	IC	S	d	r
9	9.525	3.97	4.4	0.1
9	9.525	3.97	4.4	0.2
9	9.525	3.97	4.4	0.4

80° CC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	CCGT09T301R/L–UF	0.1–1.5	0.05–0.15							○	●	●	○			
	CCGT09T302R/L–UF	0.2–2	0.05–0.2							○	●	●	○			
	CCGT09T304R/L–UF	0.4–2.5	0.05–0.25							○	●	●	○			

Note: ●Recommended grade ready to stock

Positive Inserts



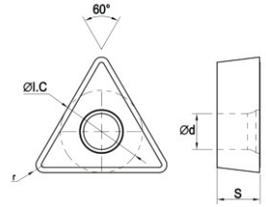
Length	Size(mm)			
	IC	S	d	r
7	6.35	2.38	2.8	0.05–0.2
11	9.525	3.97	4.4	0.1–0.2

55° DC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	DCGT0702005R/L–UF	0.1–1	0–0.1							○	●	●	○			
	DCGT070201R/L–UF	0.1–1.5	0.05–0.15							○	●	●	○			
	DCGT070202R/L–UF	0.2–2	0.05–0.2							○	●	●	○			
	DCGT11T301R/F–UF	0.1–1.5	0.05–0.15							○	●	●	○			
	DCGT11T302R/F–UF	0.2–2	0.05–0.2							○	●	●	○			

Note: ●Recommended grade ready to stock

Positive Inserts



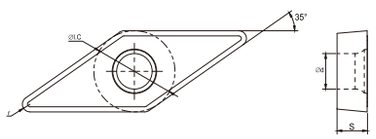
Length	Size(mm)			
	IC	S	d	r
11	6.35	3.18	2.8	0.1–0.2

60° TC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade											
				CVD						PVD					
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	TCGT110301R/L–UF	0.1–1.5	0.05–0.15							○	●	●	○			
	TCGT110302R/L–UF	0.2–2	0.05–0.2							○	●	●	○			

Note: ●Recommended grade ready to stock

Positive Inserts



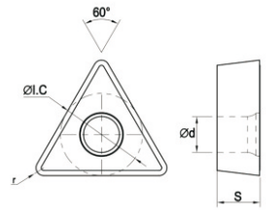
Length	Size(mm)			
	IC	S	d	r
8	4.76	2.38	2.3	0.1–0.2
11	6.35	3.18	2.8	0.1–0.2

35° VC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
Small Parts Machining	VCGT080201R/L-UF	0.1–1.5	0.05–0.15							○	●	●	○			
	VCGT080202R/L-UF	0.2–2	0.05–0.2							○	●	●	○			
	VCGT110301R/L-UF	0.1–1.5	0.05–0.15							○	●	●	○			
	VCGT110302R/L-UF	0.2–2	0.05–0.2							○	●	●	○			

Note: ●Recommended grade ready to stock

Negative Inserts



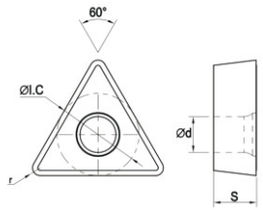
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.2–0.8

60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
Small Parts Machining	TNGG160402R/L-F	0.1–1.5	0.05–0.15							○	●	●	○			
	TNGG160404R/L-F	0.2–2	0.05–0.2							○	●	●	○			
	TNGG160408R/L-F	0.4–2.5	0.05–0.2							○	●	●	○			

Note: ●Recommended grade ready to stock

Negative Inserts



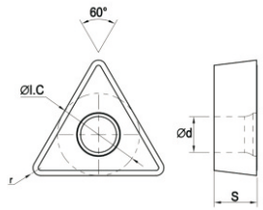
Length	Size(mm)			
	IC	S	d	r
16	9.525	4.76	3.81	0.2–0.8

60° TN□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	TNGG160402R/L–M	0.2–2	0.05–0.12							○	●	●	○			
	TNGG160404R/L–M	0.2–2.5	0.08–0.25							○	●	●	○			
	TNGG160408R/L–M	0.3–3	0.1–0.3							○	●	●	○			

Note: ●Recommended grade ready to stock

Negative Inserts



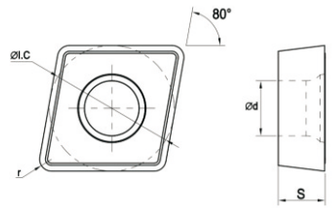
Length	Size(mm)			
	IC	S	d	r
08	4.76	2.38	2.3	0.2–0.4
09	5.56	2.38	2.8	0.2–0.4
11	6.35	3.18	3.18	0.2–0.4

60° TP□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
 Small Parts Machining	TPGH080202R/L	0.2–1	0.02–0.1							○	●	●	○			
	TPGH080204R/L	0.4–1.5	0.05–0.1							○	●	●	○			
	TPGH090202R/L	0.2–1	0.02–0.1							○	●	●	○			
	TPGH090204R/L	0.4–1.5	0.05–0.1							○	●	●	○			
	TPGH110302R/L	0.2–1.5	0.02–0.15							○	●	●	○			
	TPGH110304R/L	0.4–1.5	0.05–0.15							○	●	●	○			

Note: ●Recommended grade ready to stock

Semi-finishing for Heat Resistant Alloy



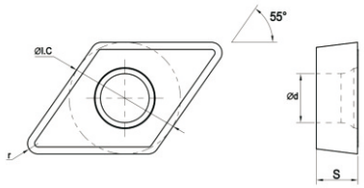
Length	Size(mm)			
	IC	S	d	RE
09	9.525	3.97	4.15	0.4
12	12.7	4.76	5.16	0.8

80° CC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD				PVD								
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 S Semi-finishing	CCMT09T304–DM	0.40–3.00	0.08–0.25						○			○	○	●		●
	CCMT09T308–DM	0.50–3.00	0.12–0.32						○			○	○	●		●
	CCMT120408–DM	0.50–3.50	0.12–0.32													

Note: ●Recommended grade ready to stock

Semi-finishing for Heat Resistant Alloy



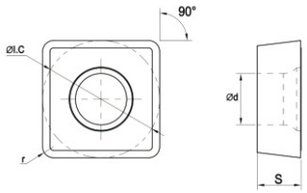
Length	Size(mm)			
	IC	S	d	RE
07	6.35	2.38	2.56	0.4–0.8
11	9.525	3.97	4.15	0.4–0.8

55° DC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD				PVD								
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 S Semi-finishing	DCMT070204–DM	0.40–2.00	0.08–0.20						○			○	○	●		●
	DCMT070208–DM	0.50–2.00	0.12–0.25						○			○	○	●		●
	DCMT11T304–DM	0.40–3.00	0.08–0.25						○			○	○	●		●
	DCMT11T308–DM	0.50–3.00	0.12–0.32						○			○	○	●		●

Note: ●Recommended grade ready to stock

Semi-finishing for Heat Resistant Alloy



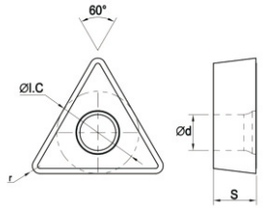
Length	Size(mm)			
	IC	S	d	RE
09	9.525	3.97	4.15	0.4–0.8

90° SC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD				PVD								
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 S Semi-finishing	SCMT09T304–DM	0.40–3.00	0.08–0.25						○			○	○	●		●
	SCMT09T308–DM	0.50–3.00	0.12–0.32						○			○	○	●		●
	SCMT120404–DM	0.40–3.50	0.08–0.25						○			○	○	●		●
	SCMT120408–DM	0.50–3.50	0.12–0.32						○			○	○	●		●

Note: ●Recommended grade ready to stock

Semi-finishing for Heat Resistant Alloy



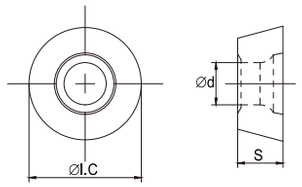
Length	Size(mm)			
	IC	S	d	RE
11	6.35	2.38	2.56	0.4–0.8

60° TC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD				PVD								
				VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VK1605	VR1510	VR1610	VR1525
 S Semi-finishing	TCMT110204–DM	0.40–2.00	0.08–0.20						○			○	○	●		●
	TCMT110208–DM	0.50–2.00	0.12–0.30						○			○	○	●		●

Note: ●Recommended grade ready to stock

Train Wheel Turning Inserts



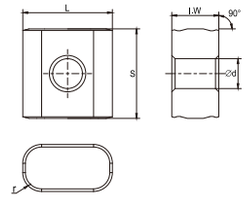
Length	Size(mm)		
	IC	S	d
8	8	3.18	3.36
10	10	3.18	4.4
12	12.7	4.76	4.4
16	16	6.35	5.5
20	20	6.35	6.5
25	25	7.94	7.2
32	32	9.52	9.5

RC□□ With Hole

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 Train Wheel Profiling	RCMX0803MO	0.50–3.00	0.15–0.40				●	○								
	RCMX1003MO	1.50–4.00	0.25–0.50				●	○								
	RCMX1204MO	2.50–5.00	0.30–0.60				●	○								
	RCMX1606MO	3.00–7.00	0.40–0.75				●	○								
	RCMX2006MO	3.50–9.00	0.48–0.90				●	○								
	RCMX2507MO	4.00–12.00	0.55–1.20				●	○								
	RCMX3209MO	5.00–15.00	0.65–1.50				●	○								

Note: ●Recommended grade ready to stock

Train Wheel Turning Inserts

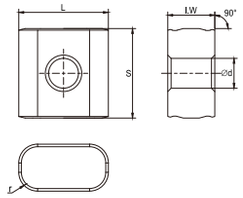


Length	Size(mm)				
	L	I.W	S	d	r
19	19.05	10	19.05	6.35	4

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 Train Wheel Trimming	175.32–191940–22	2.00–5.00	0.20–0.60				●	○								

Note: ●Recommended grade ready to stock

Train Wheel Turning Inserts

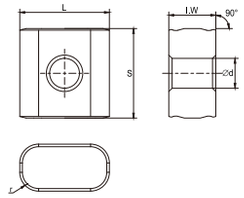


Length	Size(mm)				
	L	I.W	S	d	r
19	19.05	10	19.05	6.35	4

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 Train Wheel Trimming	175.32-191940-24	2.00-5.00	0.20-0.60				●	○								

Note: ●Recommended grade ready to stock

Train Wheel Turning Inserts



Length	Size(mm)				
	L	I.W	S	d	r
19	19.05	10	19.05	6.35	4

Shape	Type	ap (mm)	f (mm/rev)	Grade												
				CVD						PVD						
				VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 Train Wheel Trimming	175.32-191940-28	2.00-5.00	0.20-0.60				●	○								

Note: ●Recommended grade ready to stock

WECO
CUTTING TOOLS

Parting Grooving Tools

Parting and Grooving Inserts

Naming Rules

Code	Grade
G	±0.025
M	±0.05 ±0.13

2.Tolerance Grade

Code	Width (mm)
500	5.0
400	4.0
300	3.0
200	2.0

4.Cutting Edge Width

ED M N 300 – C

1.Application Code

Code	Application
EC	Parting& Grooving
ED	Parting
ER	Profile

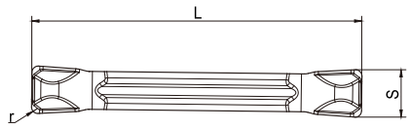
3.Cutting Direction

Code	Application
R	Right
L	Left
N	Neutral

5.Chip Breaker Code

C
G
J
M
T

Parting and Grooving Inserts



Width	Size(mm)		
	S	r±0.1	L
200	2.0	0.2	20
300	3.0	0.4	20
400	4.0	0.4	20
500	5.0	0.4	25

Shape	Type	f (mm/rev)	Grade											
			CVD						PVD					
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 NEW	EDMN200–C	0.05–0.18					●		○	●	●				
	EDMN300–C	0.07–0.25					●		○	●	●				
	EDMN400–C	0.08–0.30					●		○	●	●				
	EDMN500–C	0.09–0.35					●		○	●	●				

Note: ●Recommended grade ready to stock

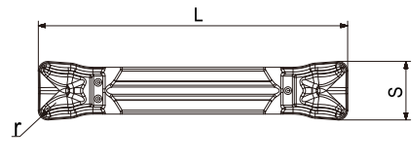
Parting and Grooving Inserts

Width	Size(mm)		
	S	r±0.1	L
200	2.0	0.2	20
300	3.0	0.4	20
400	4.0	0.4	20
500	5.0	0.4	25

Shape	Type	f (mm/rev)	Grade											
			CVD						PVD					
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 NEW	EDMN200-J	0.04-0.12					●		○	●	●				
	EDMN300-J	0.04-0.16					●		○	●	●				
	EDMN400-J	0.05-0.18					●		○	●	●				
	EDMN500-J	0.05-0.20					●		○	●	●				

Note: ●Recommended grade ready to stock

Parting and Grooving Inserts

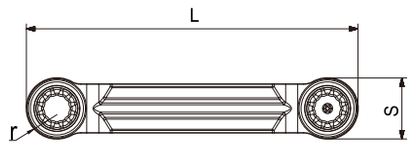


Width	Size(mm)		
	S	r±0.1	L
300	3.0	0.4	21.1
400	4.0	0.8	26.4
500	5.0	0.8	27.2
600	6.0	0.8	27.5

Shape	Type	f (mm/rev)	Grade											
			CVD						PVD					
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
	ECMN300-T	0.05-0.18					●		○	●	●				
	ECMN400-T	0.07-0.25					●		○	●	●				
	ECMN500-T	0.08-0.3					●		○	●	●				
	ECMN600-T	0.09-0.35					●		○	●	●				

Note: ●Recommended grade ready to stock

Parting and Grooving Inserts

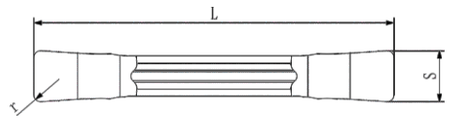


Width	Size(mm)		
	S	r±0.1	L
300	3.0	1.5	21.1
400	4.0	2	26.4
500	5.0	2.5	27.2
600	6.0	3	27.5

Shape	Type	f (mm/rev)	Grade												
			CVD						PVD						
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
	ERMN300-T	0.05-0.18					●		○	●	●				
	ERMN400-T	0.07-0.25					●		○	●	●				
	ERMN500-T	0.08-0.3					●		○	●	●				
	ERMN600-T	0.09-0.35					●		○	●	●				

Note: ●Recommended grade ready to stock

Parting and Grooving Inserts

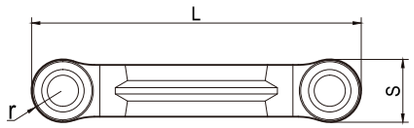


Width	Size(mm)		
	S	r±0.1	L
200	2.0	0.2	21
300	3.0	0.4	21
400	4.0	0.4	21
500	5.0	0.4	26

Shape	Type	f (mm/rev)	Grade												
			CVD						PVD						
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
	MGGN200-GL	0.05-0.18					●		○	●	●				
	MGGN300-GL	0.07-0.25					●		○	●	●				
	MGGN400-GL	0.08-0.3					●		○	●	●				
	MGGN500-GL	0.09-0.35					●		○	●	●				

Note: ●Recommended grade ready to stock

Parting and Grooving Inserts



Width	Size(mm)		
	S	r±0.1	L
200	2.0	1.0	16.0
300	3.0	1.5	21.0
400	4.0	2.0	21.0
500	5.0	2.5	26.0
600	6.0	3.0	26.0
800	8.0	4.0	31.0

Shape	Type	f (mm/rev)	Grade											
			CVD						PVD					
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1025	VK1525	VK1825	VK1824	VK1828	VR1610	VR1525
 NEW	ERMN200-M	0.05-0.15					●		○	●	●				
	ERMN300-M	0.08-0.18					●		○	●	●				
	ERMN400-M	0.10-0.20					●		○	●	●				
	ERMN500-M	0.12-0.23					●		○	●	●				
	ERMN600-M	0.15-0.27													
	ERMN800-M	0.18-0.35													

Note: ●Recommended grade ready to stock

Grinded Grooving Inserts NEW

Naming Rule

43	12.7
32	9.525
Code	Inscribed Circle diamete (mm)

2.Cutting Edge Length

150	1.5
145	1.45
125	1.25
110	1.1
Code	Width (mm)

4.Cutting Edge Width

TGF — 32 — R — 110 — 010

1.Application Code

Code	Application
ESG	Shallow Grooving Insert
ESA	Shallow Grooving Insert

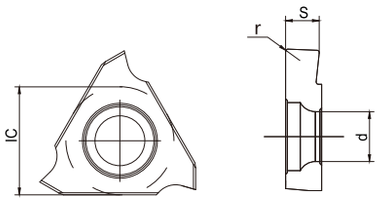
3.Cutting Direction

Code	Application
R	Right
L	Left

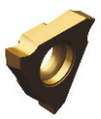
5.Chamfering Round

Code	Application
010	0.10
020	0.20
030	0.30
040	0.40

Shallow Grooving Inserts

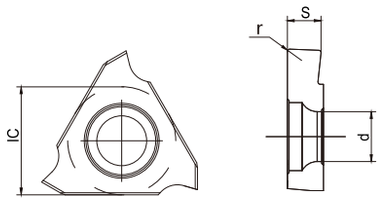


Width	Size(mm)			
	IC	S	d	r
110	9.525	1.10	4.4	0.1
125	9.525	1.25	4.4	0.1
145	9.525	1.45	4.4	0.1
150	9.525	1.50	4.4	0.1
175	9.525	1.75	4.4	0.1
185	9.525	1.85	4.4	0.1
200	9.525	2.00	4.4	0.1
250	9.525	2.50	4.4	0.1
300	9.525	3.00	4.4	0.1

Shape	Type	ap (max/mm)	Grade											
			CVD						PVD					
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
	TGF32R/L033-005	0.80							○	●	●	○			
	TGF32R/L050-005	1.20							○	●	●	○			
	TGF32R/L075-010	2.00							○	●	●	○			
	TGF32R/L095-010	2.00							○	●	●	○			
	TGF32R/L100-010	2.00							○	●	●	○			
	TGF32R/L110-010	2.00							○	●	●	○			
	TGF32R/L125-010	2.00							○	●	●	○			
	TGF32R/L145-010	2.50							○	●	●	○			
	TGF32R/L150-010	2.50							○	●	●	○			
	TGF32R/L175-010	2.50							○	●	●	○			
	TGF32R/L185-010	2.50							○	●	●	○			
	TGF32R/L200-010	2.50							○	●	●	○			
	TGF32R/L250-010	2.50							○	●	●	○			
	TGF32R/L300-010	2.50							○	●	●	○			

Note: ●Recommended grade ready to stock

Shallow Grooving Inserts



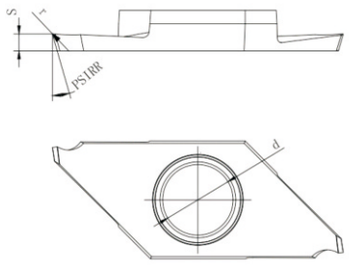
Width	Size(mm)			
	IC	S	d	r
125	12.7	1.25	4.4	0.1
125	12.7	1.25	4.4	0.2
150	12.7	1.50	4.4	0.1
150	12.7	1.50	4.4	0.2
200	12.7	2.00	4.4	0.1
200	12.7	2.50	4.4	0.2
250	12.7	2.50	4.4	0.1
250	12.7	2.50	4.4	0.2
300	12.7	3.00	4.4	0.1
300	12.7	3.00	4.4	0.2

Shape	Type	ap (max/mm)	Grade											
			CVD						PVD					
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
	GBA43R/L125-010	2.00							○	●	●	○			
	GBA43R/L125-020								○	●	●	○			
	GBA43R/L150-010	3.50							○	●	●	○			
	GBA43R/L150-020								○	●	●	○			
	GBA43R/L200-010								○	●	●	○			
	GBA43R/L200-020								○	●	●	○			
	GBA43R/L250-010	4.00							○	●	●	○			
	GBA43R/L250-020								○	●	●	○			
	GBA43R/L300-010								○	●	●	○			
	GBA43R/L300-020								○	●	●	○			

Note: ●Recommended grade ready to stock

TKF	12	R	050	-	S	-	16D	R
Name	Size	Cutting Direction	Width		Chip Breaker		(PSIRR)	PSIRR Direction
		R:Right L:Left			S: S chip breaker T: T chip breaker (nose reinforced) NB:no chip breaker			R: Right

Special Parting Inserts

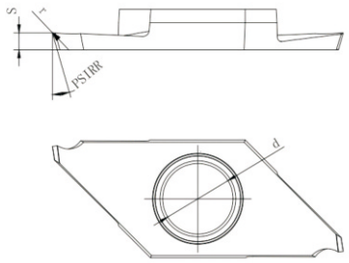


Width	Size(mm)			
	PSIRR	S	d	r
50	16°	0.50	5.2	0.03
70		0.70	5.2	0.03
100		1.00	5.2	0.03
125		1.25	5.2	0.03
150		1.50	5.2	0.03
200		2.00	5.2	0.03
50	0°	0.50	5.2	0.03
70		0.70	5.2	0.03
100		1.00	5.2	0.03
125		1.25	5.2	0.03
150		1.50	5.2	0.03
200		2.00	5.2	0.03
100	16°	1.00	5.2	0.08
150		1.50	5.2	0.08
200		2.00	5.2	0.08
100	0°	1.00	5.2	0.08
150		1.50	5.2	0.08
200		2.00	5.2	0.08

Shape	Type	ap (max/mm)	Grade												
			CVD						PVD						
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
	TKF12R/L050-S-16DR	5.00							○	●	●	○			
	TKF12R/L070-S-16DR	8.00							○	●	●	○			
	TKF12R/L100-S-16DR	12.00							○	●	●	○			
	TKF12R/L125-S-16DR	12.00							○	●	●	○			
	TKF12R/L150-S-16DR								○	●	●	○			
	TKF12R/L200-S-16DR								○	●	●	○			
	TKF12R/L050-S	5.00							○	●	●	○			
	TKF12R/L070-S	8.00							○	●	●	○			
	TKF12R/L100-S	12.00							○	●	●	○			
	TKF12R/L125-S								○	●	●	○			
	TKF12R/L150-S								○	●	●	○			
	TKF12R/L200-S								○	●	●	○			
	TKF12R/L100-T-16DR								○	●	●	○			
	TKF12R/L150-T-16DR								○	●	●	○			
	TKF12R/L200-T-16DR								○	●	●	○			
	TKF12R/L100-T								○	●	●	○			
	TKF12R/L150-T								○	●	●	○			
	TKF12R/L200-T								○	●	●	○			

Note: ●Recommended grade ready to stock

Special Parting Inserts



Width	Size(mm)			
	PSIRR	S	d	r
150	16°	1.50	5.2	0.05
200		2.00	5.2	0.05
150		1.50	5.2	0.05
200		2.00	5.2	0.05
150		1.50	5.2	0.08
200		2.00	5.2	0.08
150	0°	1.50	5.2	0.08
200		2.00	5.2	0.08

Shape	Type	ap (max/mm)	Grade											
			CVD						PVD						
			VK3020	VK3040	VK3115	VK4415	VK4425	VK4435	VK1605	VK1820	VK1625	VK1830	VK1828	VR1610	VR1525
	TKF16R/L150-S-16DR	16.00							○	●	●	○			
	TKF16R/L200-S-16DR								○	●	●	○			
	TKF16R/L150-S								○	●	●	○			
	TKF16R/L150-S								○	●	●	○			
	TKF16R/L150-T-16DR								○	●	●	○			
	TKF16R/L200-T-16DR								○	●	●	○			
	TKF16R/L150-T								○	●	●	○			
	TKF16R/L200-T								○	●	●	○			

Note: ●Recommended grade ready to stock

Threading Inserts

Naming Rules

Insert Size

Code	Diameter of IC(mm)
11	ø6.35
16	ø9.525
22	ø12.7

Cutting Type
E -External Threading Inserts
I - Internal Threading Inserts

Cutting Direction
R-Right
L-Left

16 E R 2.0 ISO — (CA)

Screw Pitch
Full profile (Range of screw pitch is indicated by numbers).

mm	TPI
0.5-6.0	48-5

V profile (Range of screw pitch is indicated by letters).

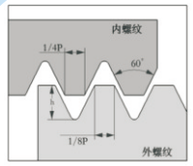
Code	mm	TPI
A	0.5-1.5	48-16
AG	0.5-3.0	48-8
G	1.75-3.0	14-8
N	3.5-5.0	7-5

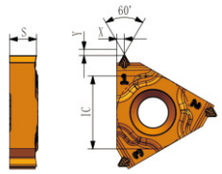
Thread specification	Range of thread pitch
ISO metric thread	0.5-6.0
General pitch thread	0.5-5.0
Whitworth thread W	8-19
British standard pipe thread	11-28
Unified thread	8-24
American standard pipe Thread	8-27

Profile
ISO-ISOmetric 60°thread
60—60°general pitch thread
55—55°general pitch thread
W—Whitworth thread
UN Unified thread(American standard threads)
BSPT-British standard taper piper thread
NPT—American standard taper piper thread

Chip Breaker
G- fully ground edge insert
CA- 3-Dimensional chip-breaking insert

ISO Metric Thread





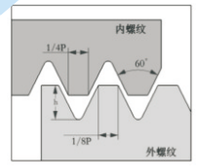
Standard:R262(DIN 13) Tolerance Class:6g/6H

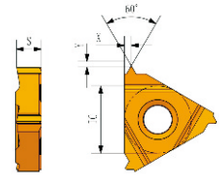
★With End

Shape	Type	Range of Thread Pitch		Insert Dimestions(mm)				Coating	
		mm	pitch/inch	IC	S	X	Y	VK1825	VK1520
	16ER1.00ISO-CA	1		9.525	3.52	0.7	0.6	●	○
	16ER1.25ISO-CA	1.25		9.525	3.52	0.9	0.7	●	○
	16ER1.50ISO-CA	1.5		9.525	3.52	1	0.8	●	○
	16ER1.75ISO-CA	1.75		9.525	3.52	1.1	0.9	●	○
	16ER2.00ISO-CA	2		9.525	3.52	1.2	0.9	●	○
	16ER2.50ISO-CA	2.5		9.525	3.52	1.5	1.1	●	○
	16ER3.00ISO-CA	3		9.525	4.65	1.7	1.2	●	○
	16IR1.00ISO-CA	1		9.525	3.52	0.7	0.6	●	○
	16IR1.25ISO-CA	1.25		9.525	3.52	0.8	0.6	●	○
	16IR1.50ISO-CA	1.5		9.525	3.52	0.9	0.7	●	○
	16IR1.75ISO-CA	1.75		9.525	3.52	1	0.8	●	○
	16IR2.00ISO-CA	2		9.525	3.52	1.1	0.8	●	○
	16IR2.50ISO-CA	2.5		9.525	3.52	1.4	1	●	○
	16IR3.00ISO-CA	3		9.525	4.65	1.5	1.1	●	○

Note: ●Recommended grade ready to stock

ISO Metric Thread





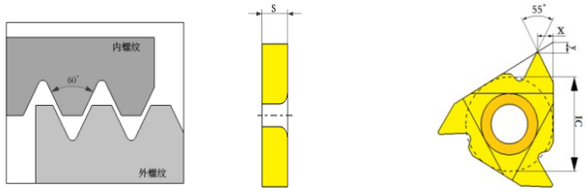
Standard:R262(DIN 13) Tolerance Class:6g/6H

★With End

Shape	Type	Range of Thread Pitch		Insert Dimestions(mm)				Coating	
		mm	pitch/inch	IC	S	X	Y	VK1825	VK1520
	16ER1.00ISO-G	1		9.525	3.52	0.7	0.6	●	○
	16ER1.25ISO-G	1.25		9.525	3.52	0.9	0.7	●	○
	16ER1.50ISO-G	1.5		9.525	3.52	1	0.8	●	○
	16ER1.75ISO-G	1.75		9.525	3.52	1.1	0.9	●	○
	16ER2.00ISO-G	2		9.525	3.52	1.2	0.9	●	○
	16ER2.50ISO-G	2.5		9.525	3.52	1.5	1.1	●	○
	16ER3.00ISO-G	3		9.525	4.65	1.7	1.2	●	○
	22ER3.50ISO-G	3.5		12.7	4.65	2.3	1.6	●	○
	22ER4.00ISO-G	4		12.7	4.65	2.3	1.6	●	○
	22ER4.50ISO-G	4.5		12.7	4.65	2.4	1.7	●	○
	22ER5.00ISO-G	5		12.7	4.65	2.5	1.7	●	○
	11IR1.00ISO-G	1		6.35	3.05	0.7	0.6	●	○
	11IR1.25ISO-G	1.25		6.35	3.05	0.9	0.8	●	○
	11IR1.50ISO-G	1.5		6.35	3.05	1	0.8	●	○
	11IR1.75ISO-G	1.75		6.35	3.05	1.1	0.9	●	○
	11IR2.00ISO-G	2		6.35	3.05	1.1	0.9	●	○
	16IR1.00ISO-G	1		9.525	3.52	0.7	0.6	●	○
	16IR1.25ISO-G	1.25		9.525	3.52	0.8	0.6	●	○
	16IR1.50ISO-G	1.5		9.525	3.52	0.9	0.7	●	○
	16IR1.75ISO-G	1.75		9.525	3.52	1	0.8	●	○
	16IR2.00ISO-G	2		9.525	3.52	1.1	0.8	●	○
	16IR2.50ISO-G	2.5		9.525	3.52	1.4	1	●	○
	16IR3.00ISO-G	3		9.525	4.65	1.5	1.1	●	○
	22IR3.50ISO-G	3.5		12.7	4.65	2.3	1.6	●	○
	22IR4.00ISO-G	4		12.7	4.65	2.3	1.6	●	○
	22IR4.50ISO-G	4.5		12.7	4.65	2.4	1.7	●	○
	22IR5.00ISO-G	5		12.7	4.65	2.5	1.7	●	○

Note: ●Recommended grade ready to stock

55°/60°General Pitch Thread



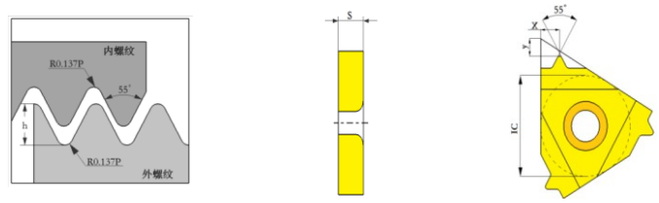
★Without End

Shape	Type	Range of Thread Pitch		Insert Dimestions(mm)				Coating	
		mm	pitch/inch	IC	S	X	Y	VK1825	VK1520
	16ERA55	0.5–1.5	48–16	9.525	3.52	0.9	0.8	●	○
	16ERAG55	0.5–3.0	48–8	9.525	3.52	1.7	1.2	●	○
	16ERG55	1.75–3.0	14–8	9.525	3.52	1.7	1.2	●	○
	22ERN55	3.5–5.0	7–5	12.7	4.65	2.5	1.7	●	○
	11IRA55	0.5–1.5	48–16	6.35	3.52	0.9	0.8	●	○
	16IRA55	0.5–1.5	48–16	9.525	3.52	0.9	0.8	●	○
	16IRAG55	0.5–3.0	48–8	9.525	3.52	1.7	1.2	●	○
	16IRG55	1.75–3.0	14–8	9.525	3.52	1.7	1.2	●	○
	22IRN55	3.5–5.0	7–5	12.7	4.65	2.5	1.7	●	○

Shape	Type	Range of Thread Pitch		Insert Dimestions(mm)				Coating	
		mm	pitch/inch	IC	S	X	Y	VK1825	VK1520
	16ERA60	0.5–1.5	48–16	9.525	3.52	0.9	0.8	●	○
	16ERAG60	0.5–3.0	48–8	9.525	3.52	1.7	1.2	●	○
	16ERG60	1.75–3.0	14–8	9.525	3.52	1.7	1.2	●	○
	22ERN60	3.5–5.0	7–5	12.7	4.65	2.5	1.7	●	○
	11IRA60	0.5–1.5	48–16	6.35	3.52	0.9	0.8	●	○
	16IRA60	0.5–1.5	48–16	9.525	3.52	0.9	0.8	●	○
	16IRAG60	0.5–3.0	48–8	9.525	3.52	1.7	1.2	●	○
	16IRG60	1.75–3.0	14–8	9.525	3.52	1.7	1.2	●	○
	22IRN60	3.5–5.0	7–5	12.7	4.65	2.5	1.7	●	○

Note: ●Recommended grade ready to stock

Whitworth Thread



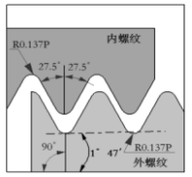
Standard:B.S.84: 1956, DIN259, ISO288/1:1982
Tolerance class: Medium class A

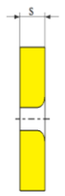
★With End

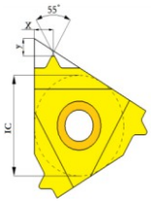
Shape	Type	Range of Thread Pitch		Insert Dimestions(mm)				Coating	
		mm	pitch/inch	IC	S	X	Y	VK1825	VK1520
	16ER8W		8	9.525	3.52	1.5	1.2	●	○
	16ER9W		9	9.525	3.52	1.7	1.2	●	○
	16ER10W		10	9.525	3.52	1.5	1.1	●	○
	16ER11W		11	9.525	3.52	1.5	1.1	●	○
	16ER12W		12	9.525	3.52	1.4	1.1	●	○
	16ER14W		14	9.525	3.52	1.2	1	●	○
	16ER16W		16	9.525	3.52	1.1	0.9	●	○
	16ER18W		18	9.525	3.52	1	0.8	●	○
	16ER19W		19	9.525	3.52	1	0.8	●	○
	16IR8W		8	9.525	3.52	1.5	1.2	●	○
	16IR9W		9	9.525	3.52	1.7	1.2	●	○
	16IR10W		10	9.525	3.52	1.5	1.1	●	○
	16IR11W		11	9.525	3.52	1.5	1.1	●	○
	16IR12W		12	9.525	3.52	1.4	1.1	●	○
	16IR14W		14	9.525	3.52	1.2	1	●	○
	16IR16W		16	9.525	3.52	1.1	0.9	●	○
	16IR18W		18	9.525	3.52	1	0.8	●	○
	16IR19W		19	9.525	3.52	1	0.8	●	○

Note: ●Recommended grade ready to stock

British Standard Taper Piper Thread







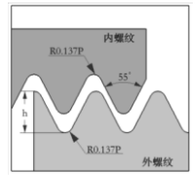
Standard:B.S.21 : 1985
Tolerance class:BSPT

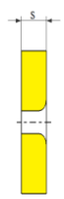
★With End

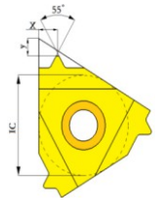
Shape	Type	Range of Thread Pitch		Insert Dimestions(mm)				Coating	
		mm	pitch/inch	IC	S	X	Y	VK1825	VK1520
	16ER11BSPT		11	9.525	3.52	1.5	1.1	●	○
	16ER14BSPT		14	9.525	3.52	1.2	1	●	○
	16ER19BSPT		19	9.525	3.52	0.9	0.8	●	○
	16ER28BSPT		28	9.525	3.52	0.6	0.6	●	○
	16IR11BSPT		11	9.525	3.52	1.5	1.1	●	○
	16IR14BSPT		14	9.525	3.52	1.2	1	●	○
	16IR19BSPT		19	9.525	3.52	0.9	0.8	●	○
	16IR28BSPT		28	9.525	3.52	0.6	0.6	●	○

Note: ●Recommended grade ready to stock

Unified Thread







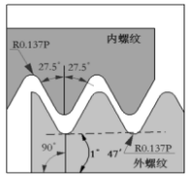
Standard: ANSI B1.1:74
Tolerance class: 2A/2B

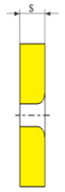
★With End

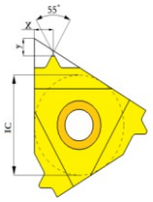
Shape	Type	Range of Thread Pitch		Insert Dimestions(mm)				Coating	
		mm	pitch/inch	IC	S	X	Y	VK1825	VK1520
	16ER8UN		8	9.525	3.52	1.6	1.2	●	○
	16ER10UN		10	9.525	3.52	1.5	1.1	●	○
	16ER12UN		12	9.525	3.52	1.4	1.1	●	○
	16ER14UN		14	9.525	3.52	1.2	1	●	○
	16ER16UN		16	9.525	3.52	1.1	0.9	●	○
	16ER18UN		18	9.525	3.52	1	0.8	●	○
	16ER20UN		20	9.525	3.52	0.9	0.8	●	○
	16ER24UN		24	9.525	3.52	0.8	0.7	●	○
	16IR8UN		8	9.525	3.52	1.5	1.1	●	○
	16IR10UN		10	9.525	3.52	1.5	1.1	●	○
	16IR12UN		12	9.525	3.52	1.4	1.1	●	○
	16IR14UN		14	9.525	3.52	1.2	0.9	●	○
	16IR16UN		16	9.525	3.52	1.1	0.9	●	○
	16IR18UN		18	9.525	3.52	1	0.8	●	○
	16IR20UN		20	9.525	3.52	0.9	0.8	●	○
	16IR24UN		24	9.525	3.52	0.8	0.7	●	○

Note: ●Recommended grade ready to stock

American Standard Taper Piper Thread







Standard: USAS B.21:1968
Tolerance class: NPT

★With End

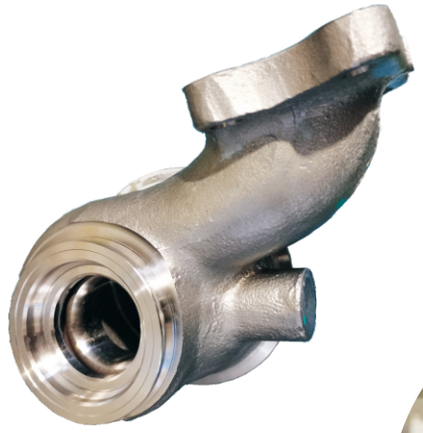
Shape	Type	Range of Thread Pitch		Insert Dimestions(mm)				Coating	
		mm	pitch/inch	IC	S	X	Y	VK1825	VK1520
	16ER8NPT		8	9.525	3.52	1.8	1.3	●	○
	16ER11.5NPT		11.5	9.525	3.52	1.5	1.1	●	○
	16ER14NPT		14	9.525	3.52	1.2	0.9	●	○
	16ER18NPT		18	9.525	3.52	1	0.8	●	○
	16ER27NPT		27	9.525	3.52	0.8	0.7	●	○
	16IR8NPT		8	9.525	3.52	1.8	1.3	●	○
	16IR11.5NPT		11.5	9.525	3.52	1.5	1.1	●	○
	16IR14NPT		14	9.525	3.52	1.2	0.9	●	○
	16IR18NPT		18	9.525	3.52	1	0.8	●	○
	16IR27NPT		27	9.525	3.52	0.8	0.7	●	○

Note: ●Recommended grade ready to stock

Turbocharger

Due to fuel saving, power, environmental protection and other reasons, turbochargers are increasingly widely used, becoming an indispensable part of the internal combustion engine. Turbocharger shell is the most important part of the turbocharger, the material is mostly made of high temperature resistant alloy material, e.g. 1.4826,1.4837,1.4848,1.4849 etc.

Our technical team is committed to developing new cutting tool materials, insert chip breakers and coatings. Currently, we are able to provide the perfect solution for different conditions for the machining of turbocharger housings from roughing to finishing.



Application No.1

XN07 is a heptagona face milling cutter, 14 effective cutting edges,rough milling of flange planes, excellent cost performance

PN09 is for finish milling of turbine shell flange plane with good surface cleanliness

CN12 is for rough machining of external and internal boring of turbine casing.

Application No.2

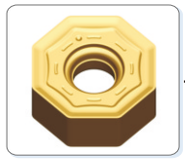
DN15 is for internal Finish boring for turbine shell

SN09 is for back milling of flanges.

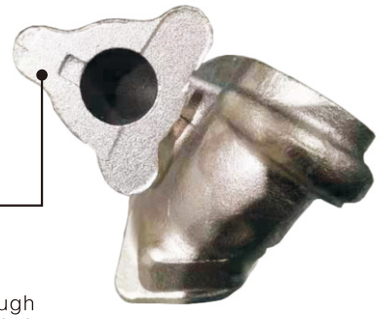
SD09 is for internal plane machining.

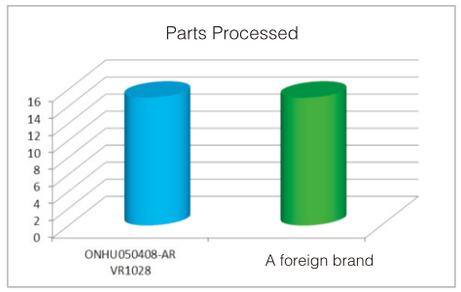
Case No.1

Workpiece material:heat–resisting steels
Workpiece:Turbine shell
Cooling type:Compressed Air
Original blade:A foreign brand
WeCan insert:ONHU050408–AF VR1028
Cutting parameter:Vc:168m/min fz:0.07mm/z ap:2.3mm
Conclusion: Our inserts cutting light and fast, low cutting force, even wear on the rear surface, compared with a foreign brand processing life of 15 pieces / edge, our products are more cost-effective.



ONHU050408–AR rough milling of turbine shell plane.

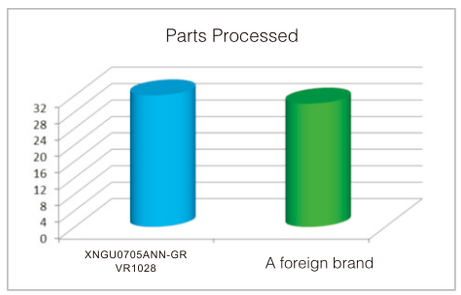




Case No.2

Workpiece material:heat–resisting steels 1.4837
Workpiece:Turbine shell
Cooling type:Cooling Liquid
Original blade:A foreign brand
WeCan insert:XNGU0705ANN–GR VR1028
Cutting parameter:Vc:261.2m/min fz:0.08mm/z ap:1.5~2mm
Conclusion: Our inserts processed 32 pieces, a foreign brand processed 30 pieces, the tool life increased by 7% with good cost performance.

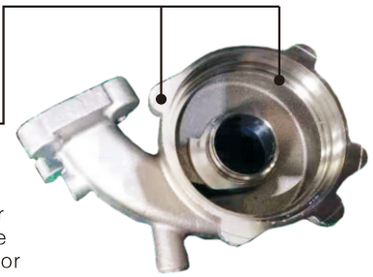
XNGU0705ANN–GR VR1028
Heptagonal face milling cutter, 14 effective cutting edges, rough milling of flange planes, excellent cost performance

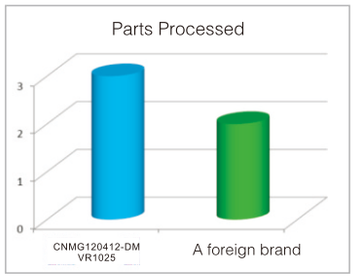


Case No.3

Workpiece material:heat–resisting steels 1.4837
Workpiece:Turbine shell
Cooling type:Compressed Air
Original blade:A foreign brand
WeCan insert:CNMG120412–DM VR1025
Cutting parameter:Boring:Vc:111m/min f:0.18 mm/rev ap:1.75mm
End face:Vc:120m/min f:0.15mm/rev ap:1.3mm
Service life:3 pieces/edge
Conclusion: Used for turbine shell boring and end face rough machining, and end face for intermittent processing, our inserts can process 3 pieces, a foreign brand processed 2 pieces, and successfully replaced

CNMG120412–DM VR1025 is for turbine shell boring and end face rough machining, and end face for intermittent processing

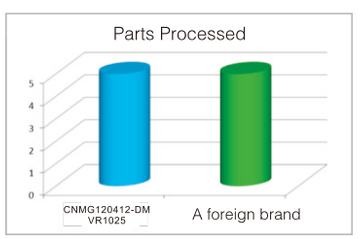




Case No.4

Workpiece material:heat–resisting steels 1.4837
Workpiece: Turbine shell
Cooling type:Cooling Liquid
Original blade:A foreign brand
WeCan insert:DNMG150404–DM VR1025
Cutting parameter: Vc: 130m/min f=0.1 mm/rev ap=0.2mm
Service life:5 pieces/edge
Conclusion: Used in the turbine casing boring and end face finishing, our inserts processed 5 pieces, a foreign brand processed 5 pieces, the single cost per piece of workpiece processing is low, and our insert's rear tool surface wear less than competitor's

DNMG150404–DM VR1025 is for internal Finish boring for turbine shell



SHARK TOOTH -
Milling Insert for Turbine Blades

❶ Steam Turbine Blade Material and Its Characteristics

Blade often use high strength, toughness, good thermal hardness of heat–resistant stainless steel, mechanical processing is difficult as follows

●Large machining allowance, in order to improve production efficiency, cutting with the highest possible cutting parameters

●High strength, high cutting force, high machining temperature, fast tool wear, easy to chipping

●Severe machining hardening, high tool groove wear

❷ Grade Features of VR1029

● Stronger bonding phase, higher resistance to plastic deformation and wear resistance, and excellent toughness

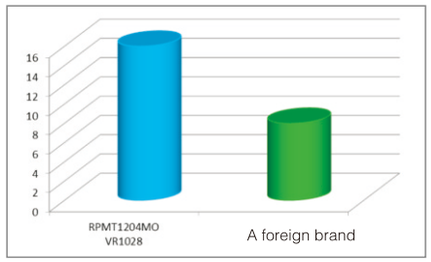
●High aluminum content gradient nano–coating for increased oxidation resistance and cutting temperature

●Smooth product surface to prevent chip tumor accumulation

●Higher economic efficiency.

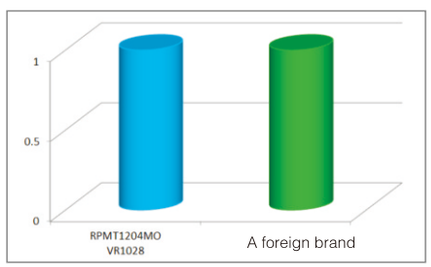
Case No.1

Workpiece material:2Cr12NiMo1W1V
Workpiece:High pressure cylinder stage 12 dynamic and locking lobe
Cooling type:Compressed Air
Processing type:Rough milling of airway profiles
Original blade:A foreign brand
WeCan insert:RPMT1204M0 VR1028
Cutting parameter:Vc:231m/min fz:0.38mm/z ap:1.5mm
Conclusion: Our blade life is 4 pieces/edge, that is single piece for 16 workpieces. A foreign brand blade life is 2 pieces/edge. Our processing quantity is 200% of the foreign brand, and the cost is significantly reduced.



Case No.2

Workpiece material: 10Cr1lCo3W3NiMoVNbNB
Workpiece: High pressure level 5
Cooling type: Compressed Air
Processing type:Rough milling of airway profiles
Original blade:A foreign brand
WeCan insert: RPMT1204M0 VR1028
Cutting parameter:Vc:221m/min fz:0.51mm/z ap:1,5mm
Conclusion: Our blade life is 1 piece/edge, that is single piece for 4 workpieces. A foreign brand blade life is 1 piece/edge. Both are forced to change the blade after processing 1 piece. Our blade wear is smaller and the cost is reduced.



HIGH FEED - Cyclone Milling

1.LNMU Series

Feature of Chip Breaker

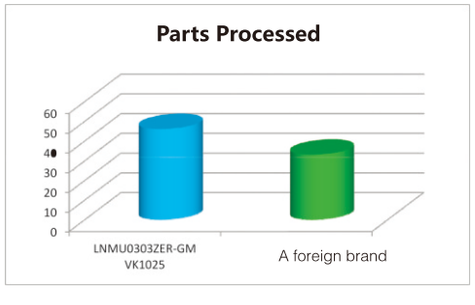
●Double–sided fast feed, cost–effective with 4–edges

● Optimized edge preparation for machining steel, stainless steel, cast iron and high–temperature alloys, etc.

●Inserts Ap is up to 1mm and can be used for shoulder milling, groove milling, ramp milling and small depth milling.

Case：

Workpiece material: Alloy Steel
Workpiece: Cutter grooving
Cooling type: Compressed Air
Original blade: A foreign brand
WeCan insert: LNMU0303ZER–GM VK1025
Cutting parameter: Vc:126m/min, fz:0.3mm/z , ap:0.8mm
Conclusion: Our blade processed 46 pcs edge, a foreign brand processed 33 pcs edge, tool life increased by 40% to meet customers' cost–effective needs.



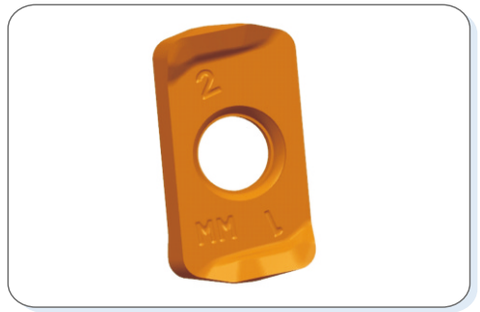
2.LOGU Series

Feature of Chip Breaker

●Double–sided with 4–edges

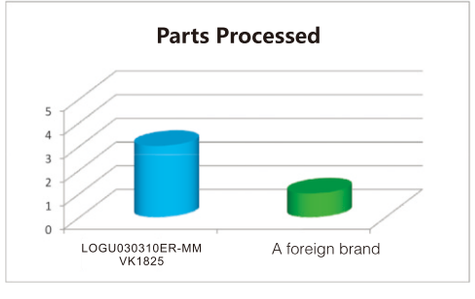
●Precision ground inserts for higher indexing accuracy

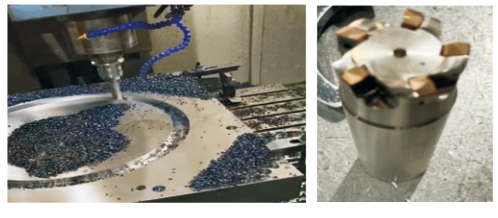
● Small–diameter and multi–edge for efficient machining, end mill diameter range 16~32mm



Case：

Workpiece material: 45# Steel
Workpiece: Automotive mold parts
Cooling type: Compressed Air
Original blade: A foreign brand
WeCan insert: LOGU030310ER–MM VK1825
Cutting parameter: Vc:180m/min, fz:0.77mm/z, ap:0.7mm
Conclusion: Our blade processed 3 pcs edge, a foreign brand processed 1 pcs edge, our blade efficiency increased by 4–5 times, the unit cost reduced by 5 times.

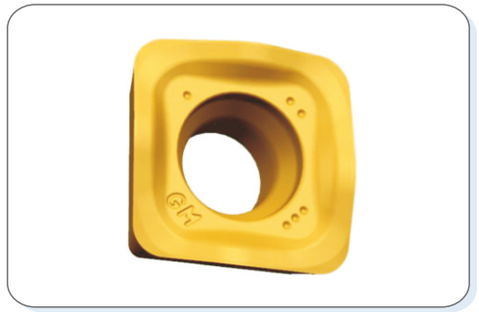




HIGH FEED - New Application

Replaces Traditional Round Milling Inserts

3. SOMT Series

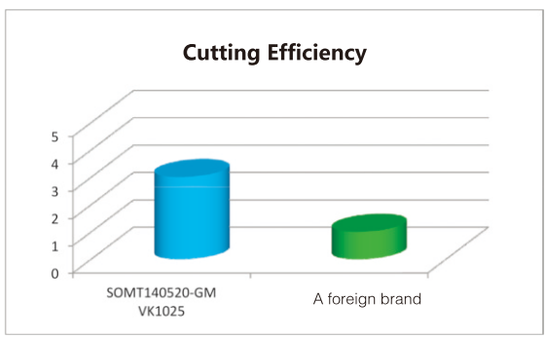


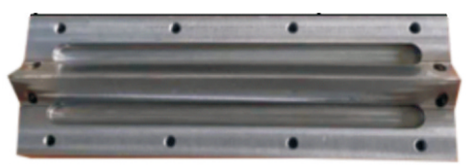
Feature of Chip Breaker

- ●Fast Feed for General Milling
- ●Convex cutting edge design inhibits impact during insert feed and improves the impact resistance of the insert.
- ●For flat surface machining, cavity machining and helical milling.

Case：

Workpiece material:SUS 431
Workpiece:Mask machine spinneret
Cooling type:Compressed Air
Original blade:A foreign brand–RPEW1003
Cutting parameter: Vc: 271 m/min, fz:0.91 mm/z, ap:0.3mm
WeCan insert:SOMT140520–GM VK1025
Cutting parameter: Vc: 178m/min, fz:1.23mm/z , ap:1mm
Conclusion: Fast feed inserts replace traditional round inserts, metal removal rate increased by 3.6 times per unit time, cutting performance increased by 300%, and tool cost reduced by 80%.



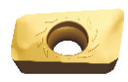


Recommendation of Milling Grade

ISO		CVD			PVD		
K Cast Iron	01				VK1015		
	10	VK3020				VK1825	VK1525
	20		VK3040				
	30						
	40						
P Steel	01						
	10				VK1015		
	20					VK1825	VK1025
	30						
	40						
M Stainless Steel	01						
	10				VK1820		
	20					VK1824 VK1825	VK1828 VK1525
	30						
	40						
S Heat Resistant Alloy	01						
	10				VR1610		
	20					VR1525	
	30						VR1029
	40						

Recommendation of Inserts and Chip Breakers

Should Milling Inserts						
	APMT–XR	APMT–GM	APMT–M2	APMT–H2	ADMT–JT	TPKT
Length	11/16	11/16	11/16	11/16	11/16	04/09
Page	B–16	B–16	B–17	B–17	B–18	B–19
Double-side Should Milling Inserts						
	ANMX	ANKT–M	LNGU–GM	WNMU–GM	XNEX–GL/GM	
Length	11/15	04/06/09/11	11	05/08	08	
Page	B–20	B–21	B–22	B–22	B–23	
Profile Milling Inserts						
	RPMW	RPMT–JM	RPMT–GM	RDKT	RPMT–XR	RPMT
Length	08/10/12	08/10/12/16	08/10/12	08/20	08/10/12	12
Page	B–24	B–24	B–25	B–26	B–27	B–28
Single-side High Feed Milling Inserts						
	EPNW–GH	LPGT–GM	SDMT–GM	SDMT–GH	SOMT–GM	SOMT–GH
Length	06	01	12/15	06/15	10	14
Page	B–29	B–29	B–30	B–30	B–31	B–31
Double-side High Feed Milling Inserts				45°Face Milling Inserts		
	LNMU–GM	LOGU–GM	BLMP–GM		SEMT–GM	SEER–GM
Length	03	03	04–11	Length	12	12/15
Page	B–32	B–32	B–33	Page	B–38	B–38

Super Alloy Titanium Alloy			
	RPHX–DF	RPHX–DM	APMT–DF
Length	10/12	10/12	11/16
Page	B–35	B–35	B–36
Double-side Cost-effective Face Milling Inserts			
	SNMU–GM	SNMX–GM	SNGX–GF
Length	13	12/16	09
Page	B–39	B–40	B–40
Double-side Cost-effective Face Milling Inserts			
	HNMG–M	XNMU–MM	XNMU–GR
Length	09	07	07/09
Page	B–42	B–43	B–43
Double-side Cost-effective Face Milling Inserts		Helix Milling Inserts	
	ONMU–GM		APKT–PM
Length	09	Length	15
Page	B–45	Page	B–46

SNMU–GM	SNMX–GM	SNGX–GF	PNCU–GM	HNMG–R	
13	12/16	09	09	09	
B–39	B–40	B–40	B–41	B–42	
					
HNMG–M	XNMU–MM	XNMU–GR	ONHU–AR	ONHU–AF	
09	07	07/09	05	05	
B–42	B–43	B–43	B–44	B–44	
	Helix Milling Inserts				
ONMU–GM		APKT–PM	SP–KM	SP–PM	
09	Length	15	12	12	
B–45	Page	B–46	B–46	B–46	

Helical Milling Inserts			
	CNHX	LNKT	LNKX
Length	16	16	12
Page	B–47	B–47	B–48

Milling Insert Code Key

1.Shape

A (85°)	B (82°)	C (80°)
D (55°)	E (75°)	H
K (55°)	L	M (86°)
O	P	R
S	T	T (75°)
V (135°)	W (80°)	Z Others

4.Chip Breaker and Hole

Code	Center Hole	Chip Breaker	Insert Profile	Code	Center Hole	Chip Breaker	Insert Profile
B	Y	N	>65°	N	N	N	
H	Y	Single	>65°	R	N	Single	
C	Y	N	>65°	F	N	Double	
J	Y	Double	>65°	A	Y	N	
W	Y	N	≤65°	M	Y	Single	
T	Y	Single	≤65°	G	Y	Double	
Q	Y	N	≤65°	X	---	---	Special Type
U	Y	Double	≤65°				

5.Cutting Edge Length

Inscribed Circle diameter (mm)	C	D	R	S	T	V	W
32.00			32				
31.75			31				
25.40			25	25			
25.00	25	25	25				
20.00			20				
19.05	19		19	19	33		
16.00		19	16				
15.875	16		15	16	27		
12.70	12	15	12	12	22	22	08
12.00			12				
10.00			10				
9.525	09	11	09	09	16	16	06
8.00			08				
6.35	06	07			11	11	
6.00			06				
5.56					09		
5.50			05				
3.97					06		

Insert Shape

6.Thickness

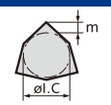
Code	Thickness(mm)
12	12.70
10	11.11
T9	9.72
09	9.52
07	7.94
T6	6.75
06	6.35
05	5.56
T4	4.96
04	4.76
T3	3.97
03	3.18
T2	2.78
02	2.38
T1	1.98
01	1.59
T0	0.99
00	0.79

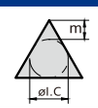
A P M T 16 04 PD E R - GM

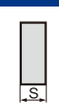
2.Clearance Angle

Code	Clearance Angle	Code	Clearance Angle
A	3°	B	5°
C	7°	D	15°
E	20°	F	25°
G	30°	N	0°
P	11°	O	Others

3.Tolerance







Code	m(mm)	d=I.C	S (mm)
A	±0.005	±0.025	±0.025
F	±0.005	±0.013	±0.025
C	±0.013	±0.025	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.005	±0.05-±0.13	±0.025
K	±0.013	±0.05-±0.13	±0.025
L	±0.025	±0.05-±0.13	±0.025
M	±0.08-±0.18	±0.05-±0.13	±0.13
N	±0.08-±0.18	±0.05-±0.13	±0.025
U	±0.13-±0.38	±0.08-±0.25	±0.13

Inscribed Circle	Regular Triangle	Square	80° Rhombus	55° Rhombus	35° Rhombus	
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18	---	---	---	---

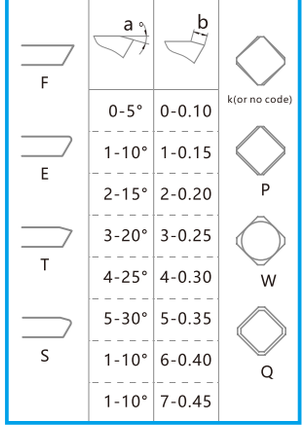
◆ Tolerance of Inscribed Circle(mm)

Inscribed Circle	Regular Triangle	Square	80° Rhombus	55° Rhombus	35° Rhombus	
6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
25.4	---	±0.13	---	---	---	±0.13

7.Approach Angle/Relief Angle

A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	other	F	25°
		G	30°
		N	0°
		P	11°
		Z	other

8.Cutting Edge Code



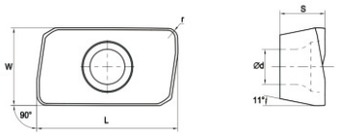
10.Chip Breaker

9.Cutting Direction Code

R	Right
L	Left
N	Neutral

Shoulder Milling Inserts

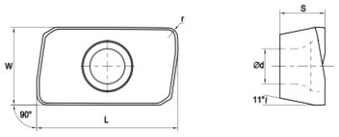
APㅁㅁ Inserts



Length	Size(mm)			
	L	W	S	r
11	11.35	6.2	3.5	0.8
16	17.35	9.3	5.26	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	APMT1135PDER-XR	2.50-7.50	0.05-0.25			○	●	○	●	●	○				
	APMT1605PDER-XR	3.50-10.00	0.07-0.50			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

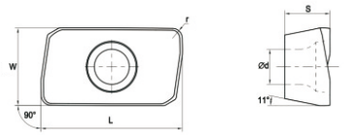


Length	Size(mm)			
	L	W	S	r
11	11.35	6.2	3.5	0.8
16	17.35	9.3	5.26	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	APMT1135PDER-GM	2.50-7.50	0.05-0.25			○	●	○	●	●	○				
	APMT160408PDER-GM	3.50-10.00	0.07-0.50			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

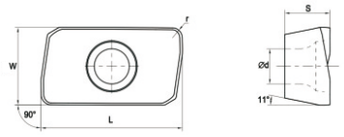
APㅁㅁ Inserts



Length	Size(mm)			
	L	W	S	r
11	11.35	6.2	3.5	0.8
16	17.35	9.2	4.76	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	APMT1135PDER-M2	2.50-7.50	0.05-0.25			○	●	○	●	●	○				
	APMT160408PDER-M2	3.50-10.00	0.07-0.30			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock



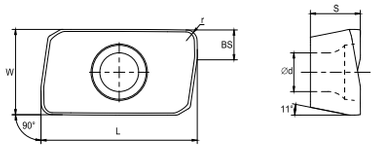
Length	Size(mm)			
	L	W	S	r
11	11.35	6.2	3.5	0.8
16	17.35	9.2	4.76	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	APMT1135PDER-H2	2.50-7.50	0.05-0.25			○	●	○	●	●	○				
	APMT160408PDER-H2	3.50-10.00	0.07-0.30			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Shoulder Milling Inserts

AD□□Inserts

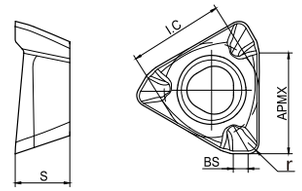


Length	Size(mm)				
	L	W	S	BS	r
11	11	6.7	3.8	1.4–2.1	0.2–1.2

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	ADMT11T302ER-JT	2.0–6.0	0.06–0.15			○	●	○	●	●	○				
	ADMT11T304ER-JT	2.2–8.0	0.08–0.15			○	●	○	●	●	○				
	ADMT11T308ER-JT	2.5–10.0	0.10–0.18			○	●	○	●	●	○				
	ADMT11T312ER-JT	2.8–10.0	0.08–0.20			○	●	○	●	●	○				
	ADMT170408ER-JT	3.5–10.0	0.08–0.25			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

TP□□Inserts



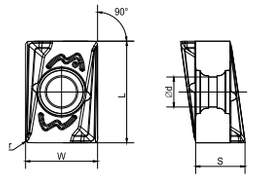
Length	Size(mm)				
	IC	S	APMX	BS	r
4	3.9	2.1	3.5	0.5–0.7	0.2–0.4
6	5.3	2.8	4.7	0.6–1.2	0.2–0.8
10	6.9	4	7	0.5–1.3	0.4–1.6
15	10.7	5	11	0.5–2.0	0.4–2.4
19	13.5	6	15	0.5–2.0	0.4–3.2

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	TPKT040202R-M	0.50–3.00	0.04–0.08			○	●	○	●	●	○				
	TPKT040204R-M	0.50–3.00	0.04–0.08			○	●	○	●	●	○				
	TPKT060302R-M	1.00–4.00	0.04–0.10			○	●	○	●	●	○				
	TPKT060304R-M	1.00–4.00	0.04–0.10			○	●	○	●	●	○				
	TPKT060308R-M	1.00–4.00	0.04–0.10			○	●	○	●	●	○				
	TPKT100404R-M	2.00–6.00	0.05–0.12			○	●	○	●	●	○				
	TPKT100408R-M	2.00–6.00	0.05–0.12			○	●	○	●	●	○				
	TPKT100416R-M	2.00–6.00	0.05–0.12			○	●	○	●	●	○				
	TPKT150508R-M	3.00–9.00	0.07–0.17			○	●	○	●	●	○				
	TPKT150516R-M	3.00–9.00	0.07–0.17			○	●	○	●	●	○				
	TPKT150524R-M	3.00–12.00	0.07–0.17			○	●	○	●	●	○				
	TPKT190608R-M	4.50–12.00	0.09–0.22			○	●	○	●	●	○				
	TPKT190616R-M	4.50–12.00	0.09–0.22			○	●	○	●	●	○				
	TPKT190624R-M	4.50–12.00	0.09–0.22			○	●	○	●	●	○				
	TPKT190632R-M	4.50–12.00	0.09–0.22			○	●	○	●	●	○				

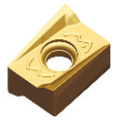
Note: ● The Recommended Grade ready to stock

Shoulder Milling Inserts

AN□□Inserts

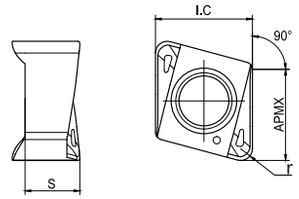


Length	Size(mm)					
	L	W	S	APMX	BS	r
11	11.85	8.4	5.7			0.4–0.8
15	15.430	11	7.3			0.8–1.6

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	ANMX110504PNR	2.00–9.00	0.10–0.20			○	●	○	●	●	○				
	ANMX110508PNR	3.00–9.00	0.10–0.20			○	●	○	●	●	○				
	ANMX150608PNR	4.50–12.00	0.10–0.20			○	●	○	●	●	○				
	ANMX150616PNR	5.00–12.00	0.10–0.20			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

AN□□Inserts



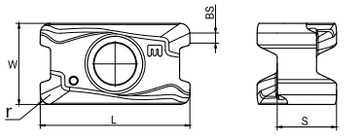
Length	Size(mm)				
	IC	S	APMX	BS	r
4	4	3.1	3.5	–	0.2–0.8
6	6.6	4.2–5.0	5.8–6.2	0.6–1.0	0.4–2.0
9	8.6	5.7–6.3	8	0.8–1.2	0.4–1.6
11	10.7	8.1	10.5	1	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	ANKT040202R–M	0.50–3.00	0.04–0.08			○	●	○	●	●	○				
	ANKT040204R–M	1.00–3.00	0.06–0.12			○	●	○	●	●	○				
	ANKT040208R–M	1.00–3.00	0.06–0.12			○	●	○	●	●	○				
	ANKT060304R–M	0.50–5.00	0.07–0.15			○	●	○	●	●	○				
	ANKT060308R–M	1.00–5.00	0.07–0.15			○	●	○	●	●	○				
	ANKT060312R–M	1.00–5.00	0.07–0.15			○	●	○	●	●	○				
	ANKT060316R–M	2.00–4.50	0.07–0.15			○	●	○	●	●	○				
	ANKT060320R–M	2.00–4.50	0.07–0.15			○	●	○	●	●	○				
	ANKT090408R–M	2.50–7.00	0.07–0.15			○	●	○	●	●	○				
	ANKT090416R–M	2.50–7.00	0.07–0.15			○	●	○	●	●	○				
	ANKT110608R–M	3.50–10.0	0.09–0.15			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Shoulder Milling Inserts

LN□□ Inserts

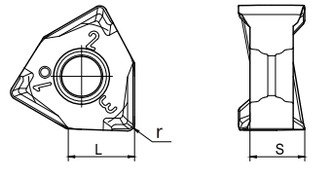


Length	Size(mm)				
	L	S	W	BS	r
11	12.16	4.83	6.6	1.4	0.4–1.2

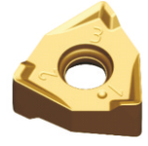
Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	LNGU110404ERGE-GM	max=10	0.50–1.50			○	●	○	●	●	○				
	LNGU110408ERGE-GM	max=10	0.50–1.50			○	●	○	●	●	○				
	LNGU110412ERGE-GM	max=10	0.50–1.50			○	●	○	●	●	○				

Note: ●Recommended grade ready to stock

XN□□ Inserts

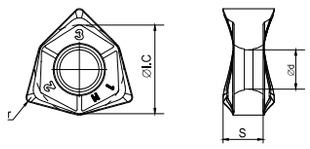


Length	Size(mm)	
	L	S
08	7.5	6.45

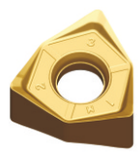
Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	XNEX080608TR-GL	0.80–8.00	0.10–0.30			○	●	○	●	●	○				
	XNEX080612TR-GL	0.80–8.00	0.10–0.30			○	●	○	●	●	○				
	XNEX080608TR-GM	0.80–8.00	0.10–0.30			○	●	○	●	●	○				

Note: ●Recommended grade ready to stock

WN□□Inserts



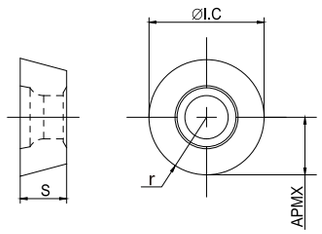
Length	Size(mm)		
	S	d	r
5	4.2	3.4	0.8
8	6.65	6.2	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	WNMU050408EN-GM	0.50–5.00	0.10–0.30			○	●	○	●	●	○				
	WNMU080608EN-GM	0.80–8.00	0.10–0.30			○	●	○	●	●	○				

Note: ●Recommended grade ready to stock

Shoulder Milling Inserts

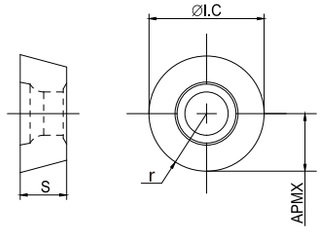
RP□□ Inserts



Length	Size(mm)			
	r	I.C	S	APMX
8	4	8	2.78	4
10	5	10	3.18	5
12	6	12	4.76	6

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	RPMW08T2MO	1.00–3.00	0.05–0.25			○	●	○	●	●	○				
	RPMW1003MO	1.50–4.00	0.05–0.30			○	●	○	●	●	○				
	RPMW1204MO	1.50–5.00	0.05–0.35			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

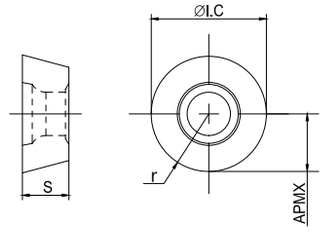


Length	Size(mm)			
	r	I.C	S	APMX
8	4	8	2.78	4
10	5	10	3.97	5
12	6	12	4.76	6
16	8	16	6.35	8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	RPMT08T2MOE-JM	1.00–1.30	0.05–0.25			○	●	○	●	●	○				
	RPMT10T3MOE-JM	1.50–4.00	0.05–0.30			○	●	○	●	●	○				
	RPMT1204MOE-JM	1.50–5.00	0.05–0.35			○	●	○	●	●	○				
	RPMT1606MOE-JM	2.00–6.50	0.10–0.40			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

RP□□ Inserts



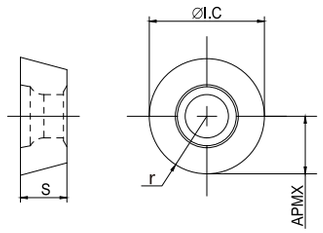
Length	Size(mm)			
	r	I.C	S	APMX
8	4	8	2.78	4
10	5	10	3.18	5
12	6	12	4.76	6

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	RPMT08T2MO-GM	1.50–4.00	0.10–0.30			○	●	○	●	●	○				
	RPMT10T3MO-GM	1.80–5.00	0.10–0.50			○	●	○	●	●	○				
	RPMT1204MO-GM	2.00–6.50	0.10–0.50			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Profile Milling Inserts

RD□□ Inserts

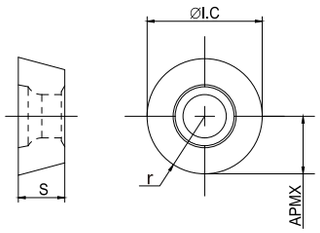


Length	Size(mm)			
	r	I.C	S	APMX
8	4	8	3.18	4
10	5	10	3.97	5
12	6	12	4.76	6
16	8	16	5.56	8
20	10	20	6.35	10

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	RDKT0803MO	1.00–3.00	0.05–0.25			○	●	○	●	●	○				
	RDKT10T3MO	1.50–4.00	0.05–0.30			○	●	○	●	●	○				
	RDKT1204MO	1.50–5.00	0.05–0.35			○	●	○	●	●	○				
	RDKT1604MO	2.00–6.50	0.10–0.40			○	●	○	●	●	○				
	RDKT1605MO	2.00–6.50	0.10–0.40			○	●	○	●	●	○				
	RDKT1606MO	2.00–6.50	0.10–0.40			○	●	○	●	●	○				
	RDKT2006MO	3.00–8.00	0.10–0.40			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

RP□□ Inserts



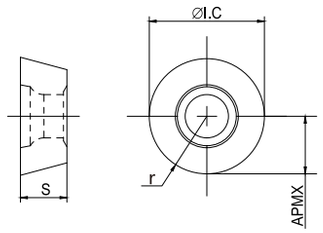
Length	Size(mm)			
	r	I.C	S	APMX
8	4	8	2.78	4
10	5	10	3.97	5
12	6	12	4.76	6

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	RPMT0803-XR	1.00–1.30	0.05–0.25			○	●	○	●	●	○				
	RPMT10T3-XR	1.50–4.00	0.05–0.30			○	●	○	●	●	○				
	RPMT1204-XR	1.50–5.00	0.05–0.35			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Profile Milling Inserts

RP□□ Inserts



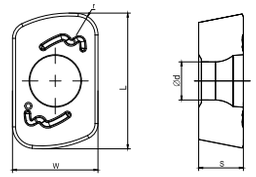
Length	Size(mm)			
	r	I.C	S	APMX
8	4	8	2.78	4
10	5	10	3.97	5
12	6	12	4.76	6

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	RPMT08T2MO	1.5–4.0	0.1–0.3			○	●	○	●	●	○				
	RPMT10T3MO	1.8–5.0	0.1–0.5			○	●	○	●	●	○				
	RPMT1204MO	2–6.5	0.1–0.5			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

High Feed Milling Inserts

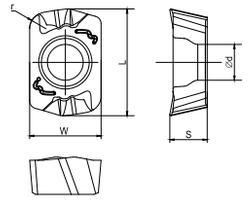
EP□□ Inserts



Size(mm)				
W	S	d	L	r
6.28	3.18	2.8	9.79	1.6

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	EPNW0603TN-GH	max=1.5	0.15–0.50			○	●	○	●	●	○				

LP□□ Inserts



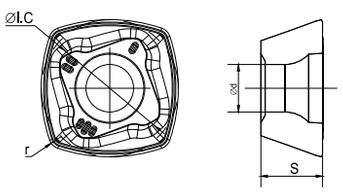
Size(mm)				
W	S	d	L	r
4.19	2.19	2.1	6.26	1

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	LPGT010210ER-GM	max=1	0.50–1.50			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

High Feed Milling Inserts

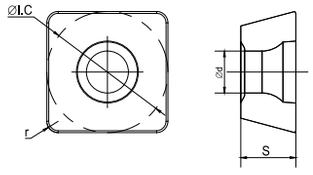
SD□□ Inserts



Length	Size(mm)		
	I.C	S	r
12	12.7	5.56	1.2
15	15.875	5.56	1.2

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SDMT120512-GM	0.50-2.00	0.60-1.20			○	●	○	●	●	○				
	SDMT150512-GM	0.80-3.00	0.60-1.20			○	●	○	●	●	○				
						○	●	○	●	●	○				
						○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

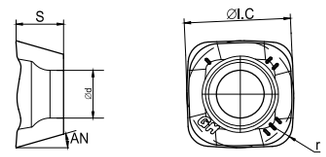


Length	Size(mm)		
	I.C	S	r
6	6.35	2.58	0.8
9	9.525	3.97	1.2
12	12.7	4.76	1.2
15	15.875	5.56	2

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SDMT06T208-GH	0.50-1.20	0.50-1.00			○	●	○	●	●	○				
	SDMT09T312-GH	0.50-1.80	0.50-1.00			○	●	○	●	●	○				
	SDMT120412-GH	0.50-2.00	0.60-1.20			○	●	○	●	●	○				
	SDMT150520-GH	0.80-3.00	0.60-1.20			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

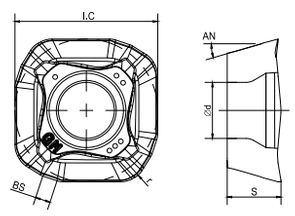
SO□□ Inserts



Length	Size(mm)				
	I.C	S	d	r	AN(°)
10	10.3	4.58	4.6	2	16

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SOMT100420ER-GM	0.10-1.20	0.20-2.00			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock



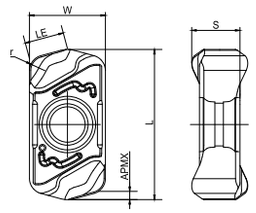
Length	Size(mm)					
	I.C	S	d	BS	r	AN(°)
14	14.76	5.56	5.8	1.6	2	16

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SOMT140520ER-GH	0.50-2.00	0.42-2.00			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

High Feed Milling Inserts

LN□□ Inserts

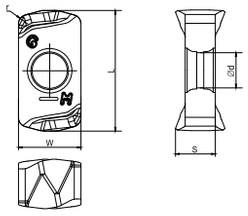


Length	Size(mm)				
	r	APMX	L	I.C	S
3	1.2	1	3.2	6	4.3

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	LNMU0303ZER-GM	0.20-2.00	0.50-1.30			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

LO□□Inserts

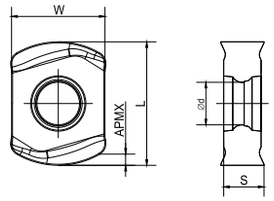


Length	Size(mm)				
	W	S	d	L	r
3	6.2	3.96	3.45	11.9	1

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	LOGU030310ER-GM	max=1	0.50-1.50			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

BL□□ Inserts



Length	Size(mm)			
	L	W	S	APMX
4	6	4.2	2.5	0.5
6	9	6.39	3.73	1
9	11.9	9.18	4.8	1.5
11	14.6	11.2	6.5	2

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	BLMP0402R-GM	0.10-0.50	0.20-1.50			○	●	○	●	●	○				
	BLMP0603R-GM	0.10-1.00	0.30-2.50			○	●	○	●	●	○				
	BLMP0904R-GM	0.10-1.50	0.30-3.50			○	●	○	●	●	○				
	BLMP1105R-GM	0.30-2.00	0.30-4.00			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Milling Grades for Hard-to-Machining

Hot Wheels Series

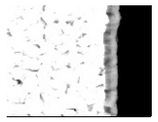
The Intro of PVD Grades

VR1029 ISO:S20 S35 M20 M35

- Utilizing medium-cobalt, medium-grained carbide matrix with high substrate toughness.
- High cost-performance, economical grade for difficult-to-machine milling.
- PVD high-aluminum coating enhances oxidation resistance and wear resistance.
  1. Recommended for rough milling of titanium alloys, heat-resistant stainless steel, and stainless steel.
  2. Particularly suitable for milling turbine blades.

VR1632 ISO:S20-S40 M20-M40

- Utilizing medium-cobalt, medium-grained carbide matrix
- with excellent toughness.
  PVD nano-composite coating ensures stable machining with extended tool life.
  1. Recommended for semi-finishing to rough milling of high-temperature alloy and titanium alloys.
  2. Delivers superior lifespan under stable working conditions.

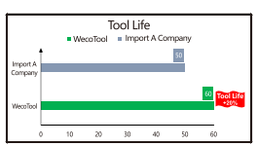


The Application of CVD Grades

Workpiece	M						S						Hardened Steel					
Application	Wearness ⟷ Toughness						Wearness ⟷ Toughness						Wearness ⟷ Toughness					
ISO	01	10	20	30	40	50	01	10	20	30	40	50	01	10	20	30	40	50
硬质合金 PVD涂层			VR1029 VR1632						VR1029 VR1632									

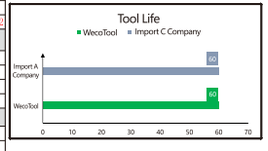
Case

Info.	Import A Company	WecoTool
Lathe	Horizontal Machining Center (HMC)	
Workpiece material	2Cr12NiMoWV	
Hardness	HB200-250	
Workpiece	Steam Turbine High-Pressure Blades	
Processing type	Rough milling	
Cutter	D32#Z4	
Insert	RPMT1204MO AP40#	RPMT1204MO VR1029
Cutting Parameter		
Vc(m/min)	220	220
f(mm/rev)	0.38	0.38
ap(mm)	1.5	1.5
Cooling Type	Internal cooling emulsion	
Test Result		
pcs/edge		
Processing Time(min)	50	60
Reason for tool change	abrasive wear	abrasive wear
VB(mm)	0.23	0.24



✓ **Conclusion: Lifetime increased by 20%.**

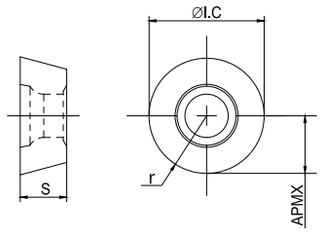
Info.	Import C Company	WecoTool
Lathe	Vertical Machining Center (VMC)	
Workpiece material	INCONEL 718	
Hardness	HB220-280	
Workpiece	Aircraft Turbine Blades	
Processing type	Rough milling	
Cutter	D32#Z4	
Insert	RPHT1204M4EN CT#240	RPHT1204M0-DM VR1632
Cutting Parameter		
Vc(m/min)	45	45
f(mm/rev)	0.35	0.35
ap(mm)	0.8-0.5	0.8-0.5
Cooling Type	Internal cooling emulsion	
Test Result		
pcs/edge		
Processing Time(min)	60	60
Reason for tool change	abrasive wear	abrasive wear
VB(mm)	0.22	0.22



✓ **Conclusion: Lifetime stays the same.**

Heat Resistant Alloys / Titanium Alloys

RP□□ Inserts

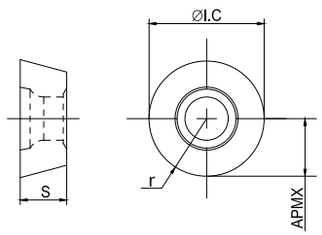


Length	Size(mm)			
	r	I.C	S	APMX
10	5	10	3.97	5
12	6	12	4.76	6

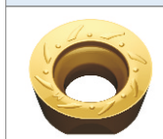
Shape	Type	ap (mm)	fz (mm/z)	CVD				PVD								
				VK3115	VK4213	VK4223	VK4235	VK1025	VK1525	VK1528	VK1824	VR1520	VR1610	VR1525	VR1632	VR1029
	RPHX10T3-DF	1.50-4.00	0.05-0.30											●	●	○
	RPHX1204-DF	1.50-5.00	0.05-0.35											●	●	○

Note: ● The Recommended Grade ready to stock

RP□□ Inserts



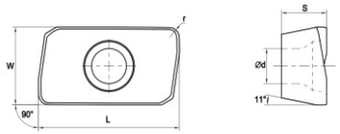
Length	Size(mm)			
	r	I.C	S	APMX
10	5	10	3.18	5
12	6	12	4.76	6

Shape	Type	ap (mm)	fz (mm/z)	CVD				PVD								
				VK3115	VK4213	VK4223	VK4235	VK1025	VK1525	VK1528	VK1824	VR1520	VR1610	VR1525	VR1632	VR1029
	RPHX10T3-DM	1.80-5.00	0.10-0.50											●	●	○
	RPHX1204-DM	2.00-6.50	0.10-0.50											●	●	○

Note: ● The Recommended Grade ready to stock

Heat Resistant Alloys / Titanium Alloys

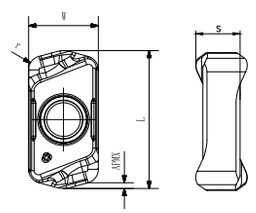
APㅁㅁ Inserts



Length	Size(mm)			
	L	W	S	r
11	11.4	6.2	3.5	0.8
16	17.25	9.2	4.76	0.8、3

Shape	Type	ap (mm)	fz (mm/z)	CVD				PVD								
				VK3115	VK4213	VK4223	VK4235	VK1025	VK1525	VK1528	VK1824	VR1520	VR1610	VR1525	VR1632	VR1029
	APMT1135PDER-DF	2.5-7.5	0.05-0.25											●	●	○
	APMT160408PDER-DF	3.5-10	0.07-0.5											●	●	○
	APMT160430PDER-DF	5.0-10	0.2-0.5											●	●	○
	APMT1135PDER-DM	2.5-7.5	0.05-0.35											●	●	○
	APMT160408PDER-DM	3.5-10	0.2-0.7											●	●	○

LNㅁㅁ Inserts

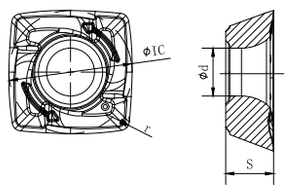


Length	Size(mm)				
	W	S	APMX	L	r
3	6	3.75	1	11.8	1.2

Shape	Type	ap (mm)	fz (mm/z)	CVD				PVD								
				VK3115	VK4213	VK4223	VK4235	VK1025	VK1525	VK1528	VK1824	VR1520	VR1610	VR1525	VR1632	VR1029
	LNMU0303ZER-MS	0.2-2.0	0.5-1.3											●	●	○

Note: ● The Recommended Grade ready to stock

SDㅁㅁ Inserts



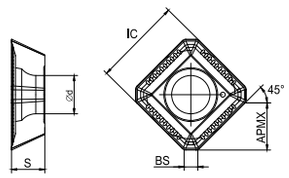
Length	Size(mm)		
	I.C	S	r
6	6.35	2.78	0.5
9	9	3.5	0.7

Shape	Type	ap (mm)	fz (mm/z)	CVD				PVD								
				VK3115	VK4213	VK4223	VK4235	VK1025	VK1525	VK1528	VK1824	VR1520	VR1610	VR1525	VR1632	VR1029
	SDMT06T205-DM		0.1-1.0											●	●	○
	SDMT09T307-DM		0.2-1.2											●	●	○

Note: ● The Recommended Grade ready to stock

45°Face Milling Inserts

SE□□ Inserts

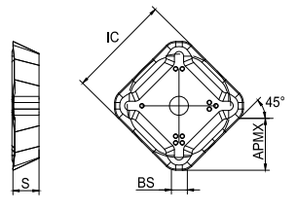


Length	Size(mm)			
	BS	APMX	I.C	S
12	1.5	6.5	12.7	4.76

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SEMT1204AFTN-GM	3.00-8.50	0.09-0.16			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

SE□□ Inserts



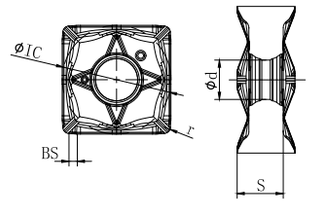
Length	Size(mm)			
	BS	APMX	I.C	S
12	1.5	6.5	12.7	3.19
15	2	8.5	15.875	4.76

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SEER1203-GM	1.50-6.00	0.10-0.25			○	●	○	●	●	○				
	SEER1504-GM	1.50-8.00	0.10-0.25			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

88°Approaching Angle Cost-effective Face Milling Inserts

SN□□ Inserts



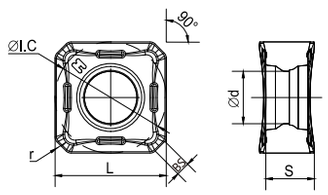
Length	Size(mm)			
	I.C	S	BS	r
13	13	5.5	1	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SNMU130508EN-GM	1.0-5.0	0.1-0.25			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Cost-effective Face Milling Inserts

SN□□ Inserts

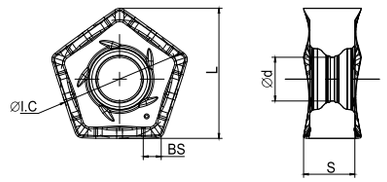


Length	Size(mm)		
	I.C	S	BS
12	12.7	6.4	1.5
16	16	7.7	1.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SNMX1205ANN-GM	1.00-6.00	0.15-0.50			○	●	○	●	●	○				
	SNMX1606ANN-GM	1.00-6.00	0.15-0.50			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

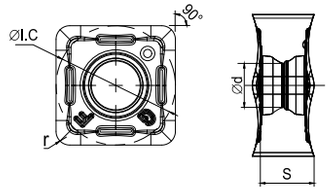
PN□□ Inserts



Length	Size(mm)				
	L	S	d	BCH	BS
09	12.2	13.4	5.35	4.5	2

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	PNCU0905GNEN-GM	0.50-3.00	0.20-0.60			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock



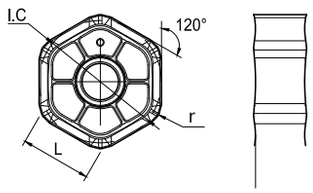
Length	Size(mm)		
	I.C	S	r
9	9.525	5.5	0.8-1.1

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SNGX090408-GF	2.50-7.50	0.08-0.15			○	●	○	●	●	○				
	SNGX090411-GF	2.50-7.50	0.08-0.15			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Cost-effective Face Milling Inserts

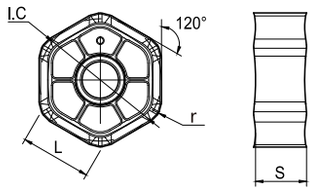
HN□□ Inserts



Length	Size(mm)		
	I.C	S	r
9	16.5	6.35	1.0

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	HNMG0907ANSN-R	1.50-4.00	0.20-0.70			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock



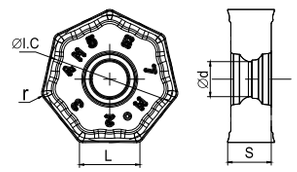
Length	Size(mm)		
	I.C	S	r
9	16.5	6.35	1.0

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	HNMG0907ANSN-M	1.00-3.00	0.05-0.15			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Cost-effective Face Milling Inserts

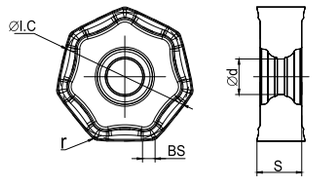
XN□□ Inserts



Length	Size(mm)			
	I.C	S	d	r
7	12	5.8	4	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	XNMU070508-MM	0.2-3.0	0.05-0.2			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock



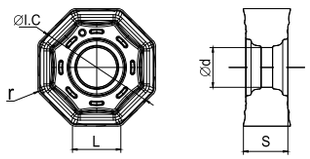
Length	Size(mm)				
	I.C	S	d	BS	r
9	19.05	5.9	5.5	1.5	1.2

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	XNMU090612-GR	0.3-3.0	0.05-0.3			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Cost-effective Face Milling Inserts

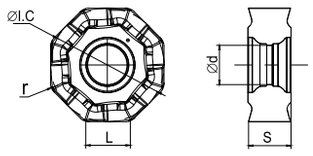
ONㅁㅁ Inserts



Length	Size(mm)		
	I.C	S	r
05	12.7	4.76	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	ONHU050408-AR	0.8-3.5	0.2-0.35			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock



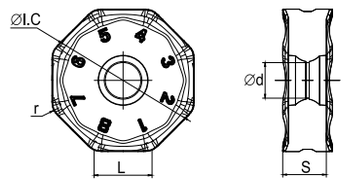
Length	Size(mm)		
	I.C	S	r
05	12.7	4.76	0.8

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	ONHU050408-AF	0.5-2.5	0.1-0.25			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Cost-effective Face Milling Inserts

ONㅁㅁ Inserts



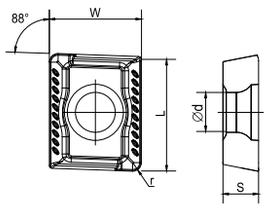
Length	Size(mm)		
	I.C	S	BS
09	22	5.8	0.45
09	22	5.8	2.11

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	ONMU090520ANTN-GM	0.80-2.50	0.10-0.20			○	●	○	●	●	○				
	ONMU090520ANTN-GR	1.00-3.50	0.10-0.20			○	●	○	●	●	○				

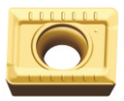
Note: ● The Recommended Grade ready to stock

Helix Milling Inserts

AP□□ Inserts

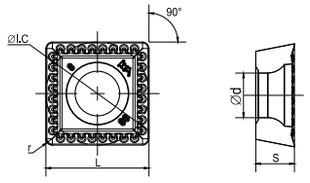


Length	Size(mm)				
	L	W	S	d	r
15	16.33	12.7	4.76	5.4	1.2

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	APKT150412-PM	1.2-8	0.08-0.2			○	●	○	●	●	○				
	APKT150415-KM	1.2-8	0.08-0.2			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

SP□□ Inserts



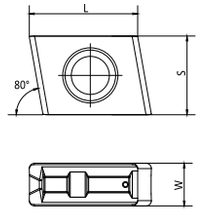
Length	Size(mm)				
	r	L	I.C	S	d
12	0.8	12.7	12.7	4.76	5.5

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	SPMT120408-PM	1.00-6.00	0.06-0.15			○	●	○	●	●	○				
	SPMT120408-KM	1.00-6.00	0.06-0.15			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

Helical Milling Inserts

CN□□ Inserts

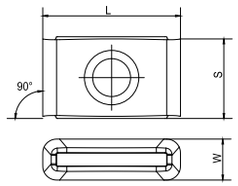


Type	Size(mm)		
	L	S	W
160608T	16	12	6.4

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	CNHX160608T	1.20-5.50	0.20-0.60			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock

LN□□ Inserts



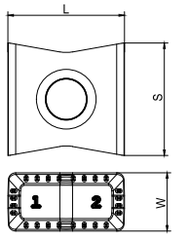
Type	Size(mm)		
	L	S	W
16090416	16	9.5	4.76

Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD									
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	LNKT16090416	1.60-12.00	0.15-0.50			○	●	○	●	●	○				

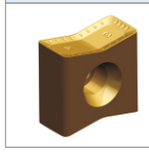
Note: ● The Recommended Grade ready to stock

Milling Inserts

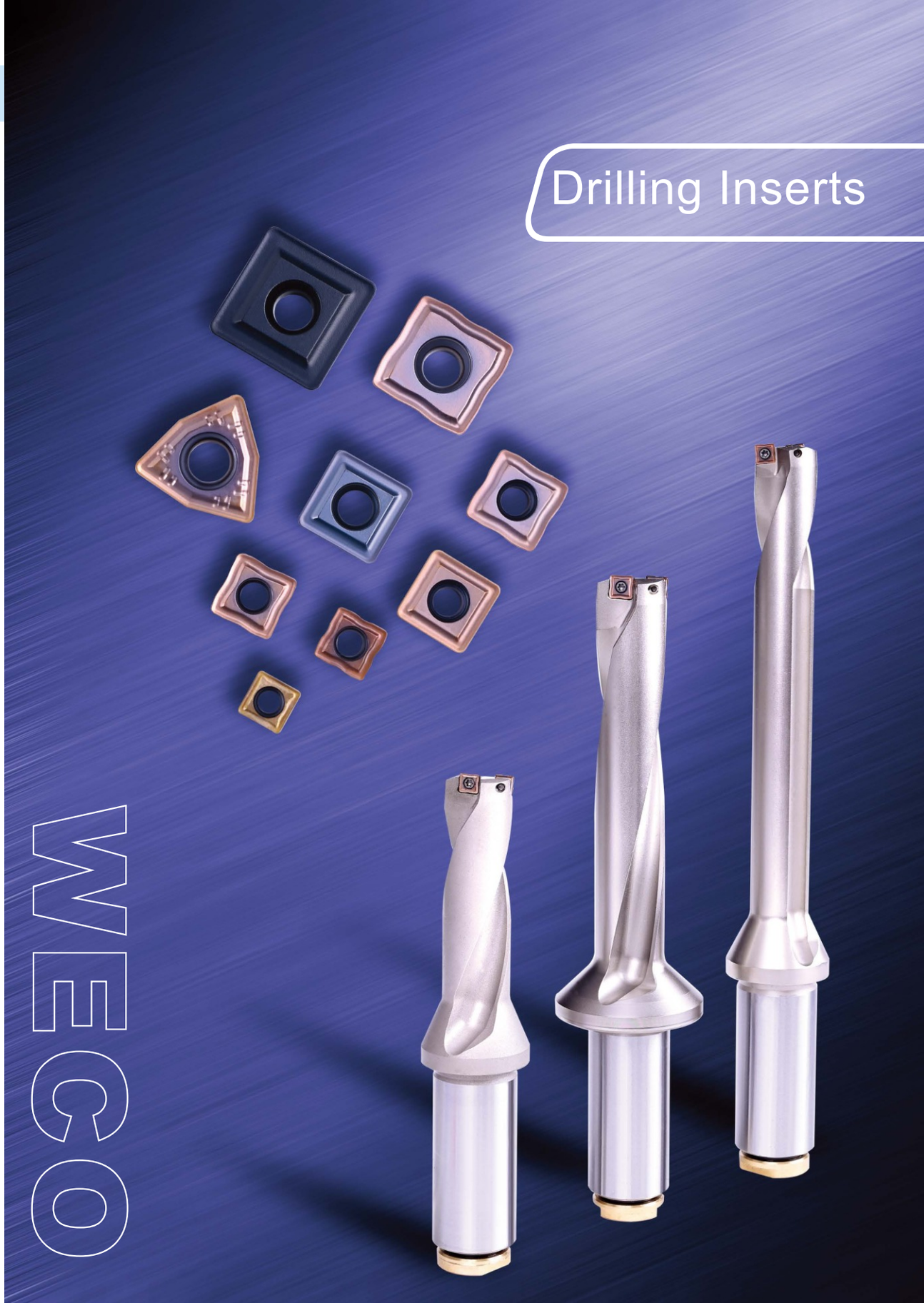
LN□□ Inserts



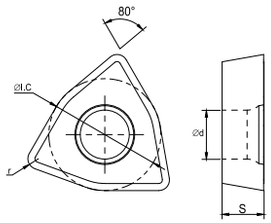
Type	Size(mm)		
	L	S	W
120608	12.7	12.25	6.35

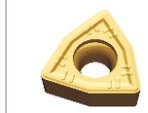
Shape	Type	ap (mm)	fz (mm/z)	CVD		PVD								
				VK3020	VK3040	VK1015	VK1025	VK1824	VK1825	VK1525	VK1828	VR1010	VR1520	VR1525	VR1029
	LNKX120608	2.00–7.00	0.10–0.20			○	●	○	●	●	○				

Note: ● The Recommended Grade ready to stock



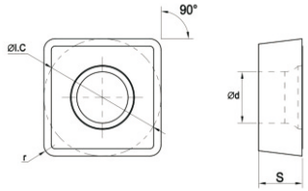
WC□□ Inserts



Shape	Type	Boring Range (mm)	Size					Application	Grade	
			L	øI.C	S	Φd	r		PVD	
									VK1025	VK1825
	WCMT030208-GM	16-20	3.8	5.56	2.38	2.8	0.8	Semi-finishing	●	●
	WCMT040208-GM	21-25	4.3	6.35	2.38	3.1	0.8		●	●
	WCMT050308-GM	26-30	5.4	7.94	3.18	3.2	0.8		●	●
	WCMT06T308-GM	31-41	6.5	9.525	3.97	3.7	0.8		●	●
	WCMT080412-GM	42-58	8.7	12.7	4.76	4.3	1.2		●	●
	WCMT030208-GF	16-20	3.8	5.56	2.38	2.8	0.8	Finishing	●	●
	WCMT040208-GF	21-25	4.3	6.35	2.38	3.1	0.8		●	●
	WCMT050308-GF	26-30	5.4	7.94	3.18	3.2	0.8		●	●
	WCMT06T308-GF	31-41	6.5	9.525	3.97	3.7	0.8		●	●
	WCMT080412-GF	42-58	8.7	12.7	4.76	4.3	1.2		●	●

Note: ● The Recommended Grade ready to stock

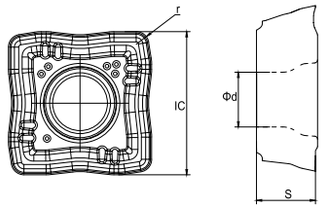
SP□□ Inserts



Shape	Type	Boring Range (mm)	Size					Application	Grade	
			L	øI.C	S	Φd	r		PVD	
									VK1025	VK1825
	SPMT050204-GM	12.5-15	5	5	2.38	2.2	0.4	Semi-finishing	●	●
	SPMT060204-GM	15.5-21.5	6	6	2.38	2.6	0.4		●	●
	SPMT07T308-GM	22-27.5	7.94	7.94	3.97	2.8	0.8		●	●
	SPMT090408-GM	28-33	9.8	9.8	4.3	4.2	0.8		●	●
	SPMT110408-GM	34-41	11.5	11.5	4.76	4.4	0.8		●	●
	SPMT140512-GM	42-50	14.3	14.3	5.2	5.75	1.2		●	●

Note: ● The Recommended Grade ready to stock

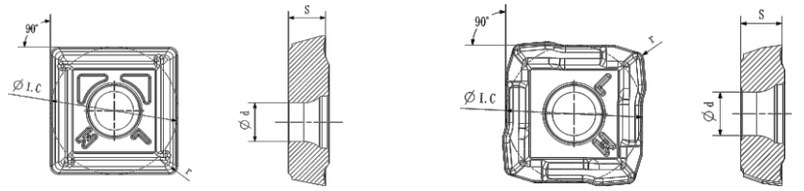
SO□□ Inserts



Shape	Type	Boring Range (mm)	Size					Application	Grade	
			L	øI.C	S	Φd	r		PVD	
									VK1025	VK1825
	SOMT040204-VP	13-16	1	4.4	2.38	2.2	0.4	Semi-finishing	●	●
	SOMT050204-VP	13-16	1.2	4.9	2.38	2.2	0.4		●	●
	SOMT060204-VP	16.5-17	1.8	5.7	2.38	2.6	0.4		●	●
	SOMT070306-VP	17.5-19	1.8	6.8	2.8	2.6	0.6		●	●
	SOMT08T306-VP	22.5-26.5	2	7.8	3.97	2.8	0.6		●	●
	SOMT09T308-VP	27.5-31.5	2.4	9.2	3.97	3.8	0.8		●	●
	SOMT11T308-VP	32-36.5	3	11	3.97	3.8	0.8		●	●
	SOMT130408-VP	37-43	3.2	12.8	4.4	4.5	0.8		●	●

Note: ● The Recommended Grade ready to stock

SO SP□□ Inserts



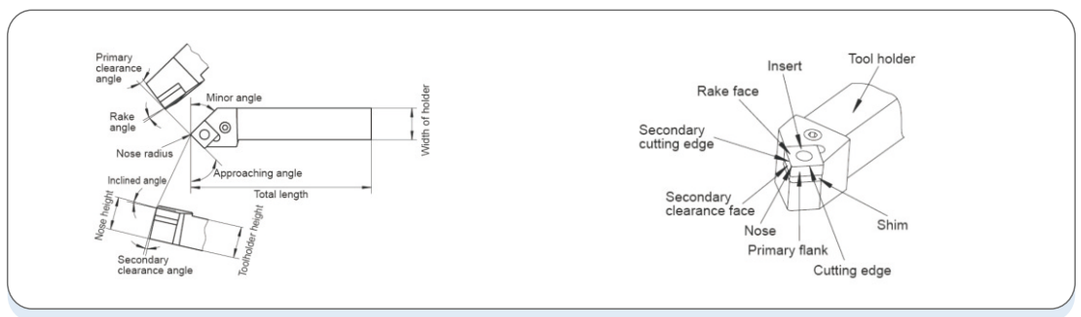
Shape	Type	Boring Range (mm)	Size				Application	Grade	
			øI.C	S	Φd	r		PVD	
								VK1025	VK1825
	SOMT050305C-LM	24-29	8.40	3.00	3.20	0.50	Medium Machining	●	●
	SOMT060406C-LM	30-41	10.20	3.50	4.00	0.60		●	●
	SOMT070406C-LM	30-41	12.36	4.00	4.00	0.60		●	●
	SOMT080508C-LM	44-63	14.90	4.50	4.70	0.80		●	●
	SOMT090608C-LM	44-63	17.90	5.50	4.70	0.80		●	●
	SPMT050308P-LM	24-29	8.90	3.00	3.20	0.80		●	●
	SPMT060408P-LM	30-41	10.70	3.50	4.00	0.80		●	●
	SPMT070410P-LM	30-41	12.70	3.95	4.00	1.00		●	●
	SPMT080510P-LM	44-63	15.50	4.50	4.70	1.00		●	●
	SPMT090610P-LM	44-63	18.60	5.50	4.70	1.00		●	●

Note: ● The Recommended Grade ready to stock

Part One: General Technical Information for Turning Machining

The Functions of Each Part of Turning Tools

❶ The Names of Each Part of Turning Tools



❷ Effects of Rake Angle

Larger rake angle makes cutting edge sharper. reduces resistant forces of chip flow. diminishes friction and prevent deformation. leading to smaller, less abrasion and higher surface quality. However, too large rake angle would reduce the rigidity and strength of tool. Heat can' t be diffused easily, Serious breakage and abrasion on tool would occur, reducing too life. Please choose rake angle according to machining conditions.

Value selection	Situations
Small rake angle	●When machining brittle and hard materials; ●When roughing and interrupted cutting
Big rake angle	●When machining Plastic or soft materials; ●When finishing;

❸ Effects of Clearance Angle

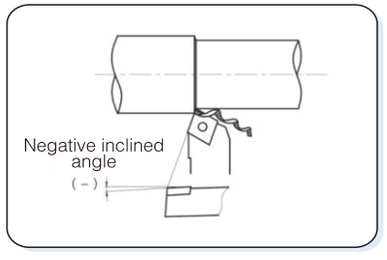
The main function of clearance angle to reduce the friction between the clearance face of tool and the surface of workpiece. When the rake angle is fixed, larger clearance angle can increase and the achieve higher surface quality. However, if clearance angle is too large, the strength of cutting edge would decrease. Also, heat can' t be diffused easily and serious abrasion would occur, reducing tool life. The principle of choosing clearance angle: Choose small clearance angle if friction is not serious

Value selection	Situations
Small clearance angle	●In order to increase nose strength when roughing ●When machining brittle and hard materials
Large clearance angle	●In order to reduce friction when finishing ●When machining materials easy to be hardened;

❹ Effects of Inclined Angle

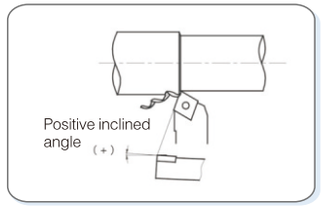
Positive or negative inclined angle determines the direction of chip flow, and also affects the strength and impact resistance of insert nose.

◆ As diagram(1) shows, when the inclined angle is negative, namely nose is in the lowest point as apposed to the bottom of tool, chips flow to the machined surface of workpiece.



◆ As diagram(2)shows , when inclined angle is positive. namely the nose is in the highest point as apposed to the bottom of the tool, chips flow to the areas of workpiece surface that haven' t been machined.

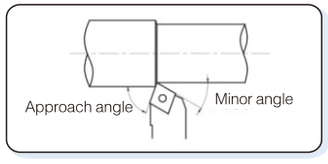
◆ The change of inclined angle also affects insert nose strength and impact resistance. When the inclined angle is negative. the nose is in the lowest point of cutting edge. When the cutting edge enters the workpiece, the contacting point is on the cutting edge or rake face, protecting the nose from impact and increase the strength of the nose. Normally, negative inclined angle should be chosen for tools with big rake angle. This can not only increase nose strength. But also prevent the impact of entry.



❺ Effects of Approach Angle

Reduces approaching angle increases the strength of tools and enable heat to diffuse easily, improving surface quality. This is becauce when the approach angle is small, cutting edge width is large, and then the unit width of cutting edge bears less cutting force. Meanwhile, tool life can be improved.

Normally, select 90° approach angle for turning of slender and step shaft; select45° approach angle for external turning. End surface machining and chamfering. When approach angle is larger, radial force is reduced, cutting is stable ,cutting thickness is increased, and chip breaking is excellent.



Value selection	Situations
Small approach	For those materials with high intensity, high hardness and hardened layer on the surface
Big approach angle	When rigidity of the machine is not enough

❻ Effects of Minor Angle

Minor angle is the main angle that can affect surface quality, and it can also affect tool strength. If the approach angle is too small, the friction between the secondary flank and machined surface of workpiece will increase, causing vibration. The principle of selecting minor angle: Select small minor angle when roughing or when the friction is unaffected and is on vibration. Select large minor angle when finishing.

❼ Effects of Cutting Edge Grinding

According to different use occasions, choose a cutting edge method from the table below

Shape of the cutting edge	shape
sharp edge	
comer	
chamfer	

Cutting edge grinding is a processing method used to maintain the cutting edge strength. The grinding amount is large, the cutting edge strength is high, not easy to damage, the tool life is improved, but the excessive grinding amount will cause the edge sharpness is not enough, the cutting force will be large, but also may produce vibration.

Value selection	Situations
Small regrinding amount	• Finishing machining – small Ap & Fn • For processing soft materials • When the machine or workpiece is not rigid enough
Large regrinding amount	• Rough machining • When machining hard materials and intermittent cutting • When machine rigidity is good

❽ Nose Radius

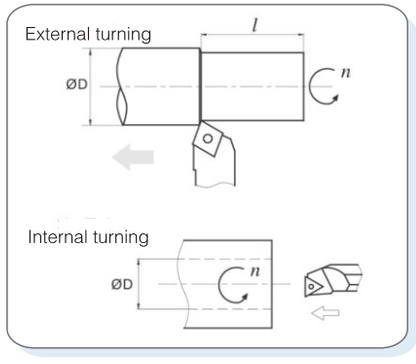
Nose radius significantly affects nose strength and surface quality.

Large nose radius means higher cutting edge strength, and the abrasion on the rake face and clearance face can be reduced to some extent. However, if the nose radius is too large, radial force will increase, and vibration is easy to occur, affecting machining precision and surface quality

Value selection	Situations
Small nose radius	●Finishing at small cutting depth ●Machining parts such as slender shaft ●When the rigidity of the machine is not enough
Large nose radius	●When roughing ●When machining hard materials (intermittent cutting) ●When the rigidity of the machine is good enough

Calculation Method of Turning Parameters

❶ Calculation of Cutting Speed



$$Vc = \frac{\pi \times D \times n}{1000} (m/\min)$$

In the formula:

Vc: Cutting speed(m/min)

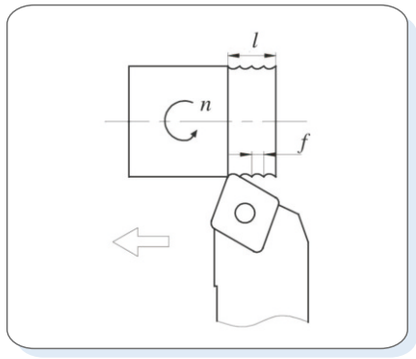
n: Rotating speed of main axle (rev/min)

D: Diameter of workpiece(mm)

For example: When the rotating speed is 500ev/min and the diameter of workpiece is 80mm, the cutting

$$Vc = \frac{\pi \times D \times n}{1000} = \frac{3.14 \times 80 \times 500}{1000} = 125.6(\mathrm{m/min})$$

❷ Calculation of Feed Rate



$$f = \frac{l}{n} (mm/rev)$$

In the formula:

f : Feed rate per rotation(mm/rev)

L: Cutting length per minute(mm/min)

N: Rotating speed of main axle(rev/min)

For example: When the rotating speed of main axle is 600ev/min, and the cutting length per minute is 150mm/min, the feed rate per

rotating should be:

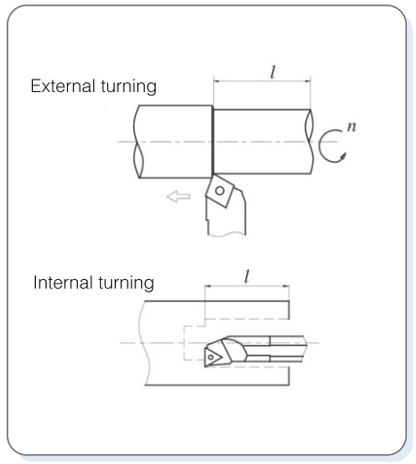
$$f = \frac{l}{n} = \frac{150}{600} = 0.25(mm/rev)$$

❸ Cutting Time Calculation of External and Internal Turning

$$T = \frac{l}{f \times n} (\min)$$

In the formula: T: Cutting time(min)
L: length of machined areas(mm)
F: Feed rate(mm/rev)
N: Rotating speed of main axle(rev/min) For example: When the rotating speed of main axle is 300rev/min, and the feed rate is 0.15mm/rev. the time needed for a cutting length of180mm should be:

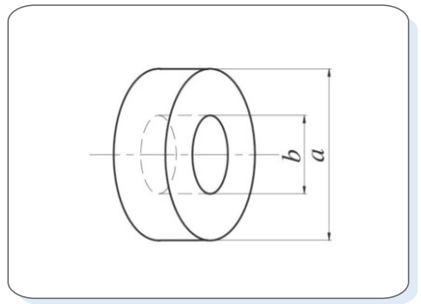
$$T = \frac{l}{f \times n} = \frac{180}{0.15 \times 300} = 4 \min$$



❹ Time Calculation End Surface Turning (Constant Linear Speed)

$$T = \frac{\pi \times (a^2 - b^2)}{4000 \times Vc \times f} (\min)$$

In the formula: T: Cutting time(min)
Vc: length of machined areas(mm)
F: Cutting speadFor end surface without hole, b =0,the formula is still Valid.

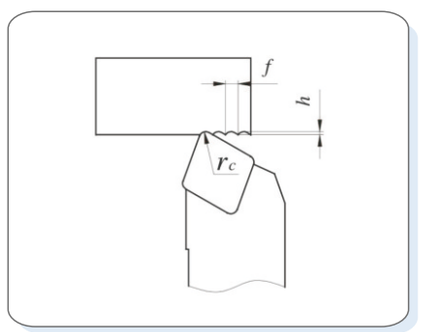


❺ The Oretical Value Calculation of Machined Surface Roughness

$$R = \frac{f^2}{8r_c} \times 1000 (\mu m)$$

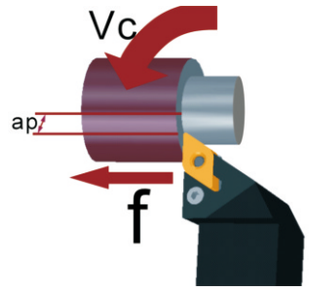
In the formula: R: Theoretical roughness value of machined surface
F: Feed rate(mm/rev)
Rc: Nose radius(mm)
For example: When the feed rate is 0.25mm/rev,and the nose radius is 0.8mm. the theoretical roughness value of machined surface should be:

$$R = \frac{f^2}{8r_c} \times 1000 = \frac{0.25^2}{8 \times 0.8} \times 1000 = 9.76 (\mu m)$$



The Influence of Three Elements of Turning on Machining

Normally, short machining time, long tool life and high machining precision are expected in machining, so the material quality. hardness. and shape of the workpiece. and properties of machine should be fully considered and then we can select suitable tools and adopt high–efficiency cutting parameters, namely three parameters.



❶ Cutting Speed(Vc)

(1)Definition of cutting speed
When the workpiece is rotating on the machine, the number of is rotation per minute is defined as Rotating speed of main axle(n). Because of its rotation, the cutting speed measured on the contacting point of diameter is defined as linear speed. (m/min). Normally, linear, linear speed is considered to measure the effect of cutting speed on machining.
(2)Effect of Cutting Speed
Cutting speed has significant effect in tool life. When the cutting speed is increased, cutting temperature will increase and tool life will be shortened. Cutting speed varies according to the different types and hardness of work–piece. The below conclusions are reached after many cutting experiments:

- Normally tool life would be reduced to half when the cutting speed is increased by 20%. Tool life would be 20% of the original life if the cutting speed is raised by 50%.
- Low speed(20–40m/min)cutting could easily cause vibration and shorten tool life.

❷ Feed Rate(Fn)

(1)Definition of feed rate
Feed rate is defined as the moving distance of tool after workpiece rotates for one circle, measured by mm/rotation.
(2)The influence of feed rate
Feed rate is a key factor that determines surface quality. Meanwhtile it also affect the range of chip forming and the thickness of chips during machining.
In term of the effect on tool life, small feed rate leads to serious abrasion on clearance face, reducing tool life.

D Technical Information

❸ Cutting Depth(ap)

(1)Definition of cutting depth

Cutting depth is defined as the difference between machined surface and unmachined surface. Measured by mm. it is half the difference value between the original diameter and machined diameter.

(2)Effect of Cutting Depth

Cutting depth should be determined by the machining alllowance and shape of workpiece, power and rigidity of machice, and tool rigidity.

The change of cutting depth has little effect on tool life. If the cutting depth is too low. The cutting nose only scrapes the hardened layer on the workpiece surface. reducing tool life. When there is hardened oxide layer on workpiece surface. higher cutting depth should be adopted within the possible range of machine' s power to avoid cutting nosr just cutting the hardened layer of workpiece.

Blade Wear and Solution

(1)Flank Wear

Problem:
Higher cutting resistance. Notch wear on flank. Poor roughness of surface or deterioration of accuracy
Reason :
Soft grades. Excessive cutting speed. Small flank angle. Low feed
Solutions:
Select a higher. wear–resistant grade. Reduce cutting speed Increase flank angle Increase feed

(2) Crater Wear

Problem:
Uncontrolled chip Poor surface quality when finishing High speed processing carbon steel
Reason:
Soft grades Excessive cutting speed Excessive feed The strength of chip breaker Insufficient
Solutions:
Change to a higher wear–resistant grade Reduce cutting speed Reduce feed Select a higher strength chip breaker

(3) Plastic Deformation

Problem:
Variation of dimension Nose wear,cutting edge drape or passivating, when processing alloy steel Poor surface roughness
Reason:
Soft grade Excessive cutting speed Excessive cutting depth and feed rate Overheat on cutting edge
Solutions:
Select a higher red hardness cutting material Decrease cutting speed Decrease cutting depth and feed rate Select a higher thermal conductivity cutting material(CVD+sufficient coolant)

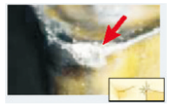
(4) Build–Up–Edge

Problem:
Workpiece dissolve with Cutting edge Poor surface roughness when finishing Cutting resistance increased Cutting soft materials
Reason:
Cutting speed too low Cutting edge obtuse Unsuitable tool material
Solutions:
Increase cutting speed Increase rake angle Select small sticking force

(5) Chip Hammering

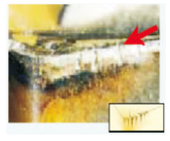
Problem:
Part of the cutting edge that does not participate in cutting is damaged by chip hammering, the upper and support of the insert may be damaged.
Reason:
Chip folds back to the cutting edge
Solutions: Change the feed rate and choose another type of chip breaker

(6) Insert Fracture



Problem:
Cutting resistance increased Poor surface Roughness
Reason:
Toughness insufficient Excessive feed rate Strength of cutting edge insufficient Instability of the tool
Solutions:
Select a tougher grade Decrease feed rate Increase honing of cutting edge(chamfering to rounding) Increase the stability and setting angle

(7) Themal Crack



Problem:
Crack by heat cycle(often happen in milling and interrupted cutting)
Reason :
Toughness of tool grade insufficient Swell and shrink by cutting heat(cold–thermocycling)
Soultions:
Cutting without coolant/Sufficient coolant Select a tougher and more thermal shock resistance grade

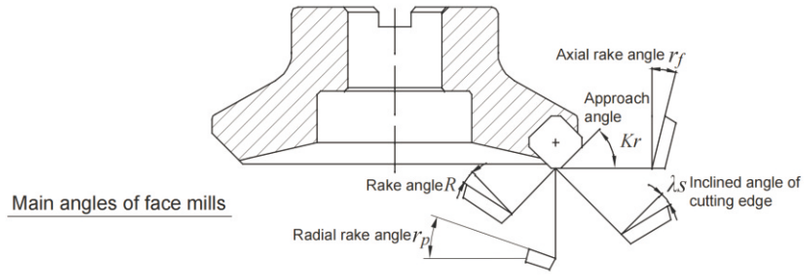
(8) Chipping

Problem:
Sudden fracture of cutting edge (rake face and flank)Instability insert life
Reason :
Toughness insufficient Excessive feed rate Strength of cutting edge insufficient Instability of the tool
Solutions:
Select a tougher grade Decrease feed rate Increase honing of cutting edge (chamfering to rounding) Increase the stability and setting angle

D Technical Information

Second Part:Technical Information About Indexable Miling Tools

Function of Each Part in Face Milling

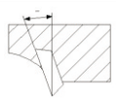
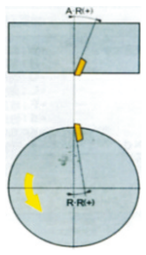
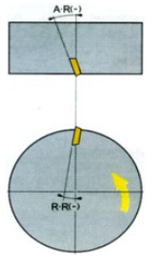
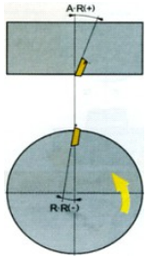
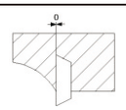
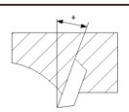


Main angles of face mills

Designation	Function	Effect		
Axial rake angle γf	Determining the chip direction	Negative,excellent capability of chip removal		
Radial rake angle γp	Determining whether the cutting is easy and fast or not	Positive angle:good cutting performance		
Approach angle Kr	Determining the chip thickness	Kr↑, chip thickness ↑; Kr↓chip thickness ↓		
Rake angle Ro	Determining whether easy and fast the cutting is or not	Poor cutting performance, High– Poor cuttingstrength cutting edge	(–) ←0→ (+)	Good cutting performance, Lowstrength cutting edge
Inclined angle λs	Determining the chip flow direction	Poor capability of chip removal,High–strength cutting edge	(–) ←0→ (+)	Good performance of chip removal, Low–strength cutting edge

❶ Milling Cutter Parameters Selection

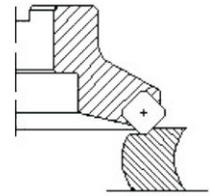
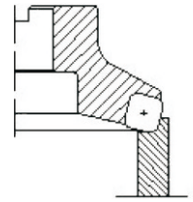
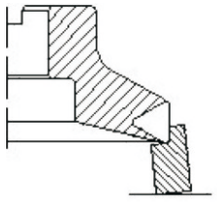
●Characteristics of Different Rake Angles Combined

		Double positive rake angle	Double negative rake angle	Positive and negative negative rake angle
Negative rake angle				
0° rake angle				
Positive rake angle				
Axial rake angle γ_f		+	–	+
Radial rake angle rp γ_p		+	–	–

Applicable material machined	P	√		√
	M	√		√
	K		√	√
	N	√		
	S	√		√

❷ Selection of Approach Angle

●Selection Method of Cutting Tools

Designation	Schematic diagram	Instruction
45°		Axial force is the largest, it will bend when machining thin–wall workpiece, reducing the precision of workpiece. It can help avoid fringe brekage of workpiece when machining cast iron
75°		The main force is radial cutting force, in is often used in general face milling
90°		The main force is radial cutting force, in is often used in general face milling

❸ Selection of Approach Angle：

The approach angle is formed by insert and tool body. It affects chip thickness. Cutting forces and tool–life.Decreasing the approach angle reduces chip thickness and expands the cutting area between cutting edge and workpiece at a given feed rate. A Smaller approach angle also ensures stable entry into or exiting workpiece, protecting the cutting edge and extending tool life.However, this will increase axial cutting forces on the workpiece, thus is not suitable for machining thin workpiece Such as thin plate.

Approach angle	Feed rate per tooth f_z	Maximum chip stickiness h_{ex}
90°	f_z	$h_{ex} = f_z \times sinKr$
75°	f_z	$h_{ex} = 0.96 \times f_z$
60°	f_z	$h_{ex} = 0.86 \times f_z$
45°	f_z	$h_{ex} = 0.707 \times f_z$
Circular Blade	f_z	$h_{ex} = \frac{\sqrt{iC^2 \times (iC - 2a_p)^2}}{iC} \times f_z$

❹ Pitch Selection

Pitch is the distance between one point on one cutting edge and the same point on the next edge.

Optimized stability		
L (Low)	M (Medium)	H (High)
Coarse pitch 	Close pitch 	Extra close pitch 
When the milling width is equal to diamete of cutter, the machining system is stable and main power of machine is sufficient, the use of coarse pitch can achieve high productive efficiency.	Used in general milling and multiple mixed productions.	When the milling width is less than diameter of cutter, cutting by maximum edges can achieve high productive effciency.

Milling Calculation

❶ General Formula

Vc : cutting speed (m/min)
D_C : nominal diameter of milling tool (mm)
n : spindle speed (rev/min)
z_n : number of teeth
Q : metal removal rate(cm³/min)
V_f : feed rate of worktable (feed speed) (mm/min)
f_z : feed rate per tooth (mm/z)
π : circumference ratio=3.14
T_c : machining time (min)
f_n : feed rate per revolution (mm/rev)
L : Actual working distance (mm)

●Cutting speed

$$Vc = \frac{\pi \times D_C \times n}{1000} \text{ (m/min)}$$

●Spindle speed

$$n = \frac{1000 \times V_C}{\pi \times D_C} \text{ (rev/min)}$$

●Feed rate of worktable(feed speed)

$$V_f = f_z \times n \times z_n \text{ (mm/min)}$$

●Feed rate per tooth

$$f_z = \frac{V_f}{n \times z_n} \text{ (mm/z)}$$

●Feed rate per revolution

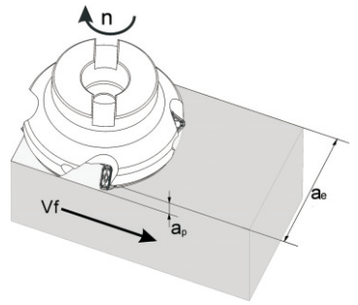
$$f_n = \frac{V_f}{n} \text{ (mm/rev)}$$

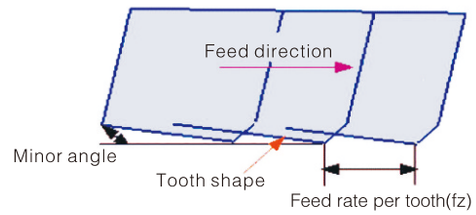
●Machining time

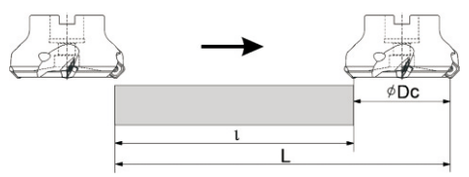
$$T_c = \frac{L}{v_f} \text{ (min)}$$

●Metal removal rate

$$Q = \frac{a_p \times a_e \times V_f}{1000} \ cm^3/\text{min}$$





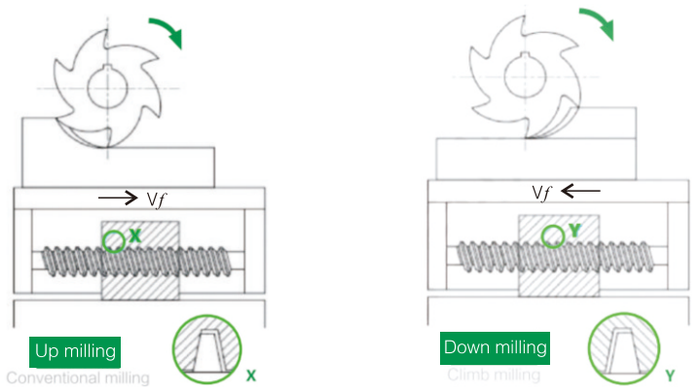


D Technical Information

Difference and Selection Between Down Milling and Up Milling

Climb milling (also called down milling): the feed direction of workpiece is the same as that of the milling rotation at the connecting position.

Conventional milling (also called up milling): the feed direction of workpiece is opposite to that of the milling rotation at the connecting position.



In down milling. the major force of cutting edge is the compressive stress, while in up milling is the tensile stress. The compressive strength of cemented carbide material is much larger than its tensile strength. In down milling, as chips become thin from thick gradually, cutting edge and workpiece press against each other. The friction between edge and workpiece is small, thus reducing the abrasion of edge, the hardening of workpiece surface and the surface roughness (Ra). In up milling. chips become thick from thin gradually. When the insert is cutting into the workpiece, it produces strong friction and more heat than in down milling, and make workpiece surface hardened.

In up milling, because horizontal direction of cutting force milling cutter conducting on workpiece is opposite to the feed direction of workpiece, the lead screw of worktable joints closely with one side of the screw nut. In down milling, the direction of cutting force is the same as the feed direction. When edge's radial force on workpiece is large enough, the worktable will bounce left and right. thus make the gap fall behind. The gap will return to the front side with the continuing rotation of lead screw. At this moment the worktable stops motion, however, it will bounce left and right again when the radial cutting force is large enough again. The periodical bounce of worktable will cause poor surface quality of workpiece and tool breakage.

When using end mills for down milling, the edges always starts cutting at the workpiece surface, therefore end mills are not suitable for machining workpiece with hardened surface

Up milling is recommended for milling thin–wall components or square milling with high requirement for precision.

CVD Grades Comparison Table

ISO	WeCoTool	SANDVIK	KENNAMETAL	SecoTool	ISCAR	TaeguTec	Walter	TUNGALOY	KYOCERA	KORLOY	SUMITOMO	MITSUBISHI	ZCC.CT
P10	VK4415	GC4315	KCP10 KC9110	TP1500	IC5005 IC8150	TT8115	WPP05S WPP10S	T9115	CA5505 CA5515	NC3215	AC810P AC820P	UE6110 MY5015	YBC151 YBC152
P20	VK4425	GC4325	KCP25 KC9125 KC9225	TP2500	IC8150 IC8250	TT5100 TT8125	WKP25S WPP20S WMP20S	T9025 T9125	CA5515 CA5525	NC3225 NC3120 NC5330	AC2000 AC820P	UE6020 MC6025 F7030	YBC251 YBC252
P30	VK4435	GC4325 GC4335	KCP30 KCP40	TP3000	IC8250 IC8350	TT8125 TT5100	WKP35S WPP30S WMP20S	T9135 T9035	CA5525 CA5535	NC3030 NC5340 NC500H	AC630M AC830P	UE6020U E6035U H6400	YBC252 YBC351
M10		GC2015	KCM15		IC6015 IC8150	TT9215	WMP20S		CA6515 CA6015	NC9115	AC610M AC630M	US7020 MC7015	YBM251 YBM153
M20		GC2015 GC2025	KCM15 KC9225	TM2000	IC6025 IC8150 IC8250	TT9225	WMP20S	T6020 T6130	CA6515 CA6525	NC9115 NC9125 NC5330	AC630M AC830P	US7020 MC7015 MC7025	YBM251 YBM253
M30		GC2035 GC2025	KCM25 KC9230	TM4000	IC6025 IC8250 IC8350	TT5100	WSM45X	T6130	CA6525	NC5340 NC5350 NC9135	AC630M	MC7025 US735 F7030	YBM351
K10		GC3210 GC3215	KCK05 KCK15	TK1000	IC5005 IC5010	TT1300	WAK15 WPP01	T5010 T5115	CA4505 CA4010	NC6315	AC410K	UC5115 MY5015	YBD102 YBD152
K20	VK3115	GC3215	KCK15 KCK20	TK2000	IC5005 IC5010	TT7105 TT7310	WKP25S WPP10S	T5115 T5125	CA4515 CA4115	NC6315 NC5330	AC410K AC420K	UC5115 UE6110 MC5020	YBD152
K30	VK3040	GC3225	KC9325		IC5010		WKP35S WPP20S	T5125		NC5340	AC820P	UE6110	YBD252

D Technical Information

PVD Grades Comparison Table

ISO	WeCoTool	SANDVIK	KENNAMETAL	SecoTool	ISCAR	TaeguTec	Walter	TUNGALOY	KYOCERA	KORLOY	SUMITOMO	MITSUBISHI	ZCC.CT
P10	VK1025	GC1010 GC1025	KC715M		IC807 IC907	TT7030 TT7080	WXM15 WSM10 WSM10S		PR730 PR830 PR1225		ACP100 ACP200	VP10MF	YBG102 YBG105
P20	VK1825 VK1525 VK1025	GC1010 GC1025 GC2030	KC522M KC525M	CP200	IC807 IC907 IC3028	TT7030 TT9030 TT9080	WSM20 WSM20S WSM21	AH725 AH120 GH330	PR730 PR830 PR1225	PC3600	ACP200	VP15TF VP20RT VP20MF	YBG202 YBG205
P30	VK1025	GC1025 GC1030	KC725M KC530M	CP500	IC807 IC808 IC3028	TT8080 TT9030 TT9080	WSP45S WSP46 WSM30S	AH730 GH130 AH130	PR660 PR1230	PC3600 PC3500 PC5300	ACZ300 ACZ350 ACZ200	VP15TF VP30RT VP20MF	YBG302
M10	VK1824	GC1025 GC1030	KC715M	CP200	IC807		WSM10 WSM10S		PR630 PR730 PR1225	PC8105 PC8110	ACP200	VP10MF	YBG202 YBG205
M20	VK1824 VK1525 VK1828	GC1025 GC1030	KC5025 KC715M	CP200 TS2500 CP500	IC354 IC807 IC3028	TT9030 TT9080	WSM20 WSM20S WSM21	GH120 AH120 AH725	PR660 PR730 PR1225	PC8110 PC8115 PC5300	ACZ310 AC520U ACP300	VP15TF VP20RT VP20MF	YBG202 YBG205 YB9320
M30	VK1828	GC1030 GC1040 GC2030	KC725M KC5525	CP500 F30M	IC808 IC908	TT8080 TT9030 TT9080	WSP35S WSP36 WSM30S	AH130 GH130 AH730	PR660 PR730	PC5300 PC9530 PC5400	ACZ330 AC520U ACZ350	VP15TF VP30RT MP7030	YBG302 YBG402
K10	VK1015	GC1210	KC5010 KC510M	CP200	IC910		WHH15 WXM15	AH110 GH110	PR510 PR905 PR1210	PC8110 PC6510	ACZ310 ACK200	VP10RT	YBG102 YBG105
K20	VK1825 VK1525 VK1025	GC1020 GC1220	KC5025 KC520M KC525M	CP200 CP500	IC808 IC908	TT6080	WKK25S	AH120 GH110 AH330	PR905 PR1210	PC5300	ACZ310 ACK200	VP15TF VP20RT	YBG202
K30	VK1025	GC1020	KC735M KU25T	CP500	IC808 IC908		WKK25S	GH130		PC5400	ACZ330 ACK300	VP15TF VP20RT	YBG205 YBG302
S10	VK1605 VR1610	GC1025	KC510M KC5510 KCS10B	CP200 TS2000	IC806	TT9030	WSM10 WSM10S	AH905 AH110 SH730	PR660 PR905	PC8105 PC8110	EH520Z EH20Z AC510U	VP10RT VP20RT	YBS103
S20	VK1525 VR1520 VR1525	GC1025 GC2030	KC522M KC525M KC5525	CP250 TS2500 CP500	IC806 IC807 IC808	TT9030 TT9080	WSM20 WSM20S WSM21	AH120 AH725	PR1225 PR905	PC8115 PC5300	EH520Z EH20Z AC520U	VP15TF VP20RT MP9130	YBS203
S30	VR1029 VR1030	GC2030 S30T	KC725M	F40M	IC8350	TT8080 TT9030 TT9080	WSM45S WSP46 WSM30S	AH725	PR905	PC5400	ACK300 AC520U	VP15TF	YBS303