



元磁特殊金屬有限公司
GUASS SPECIAL METAL PRODUCT CORP.



2023

碳化鎢與 **CNC** 可轉位刀片專業生產製造

Professionally Manufactured of Indexable Inserts & Tungsten Carbides



元磁特殊金屬有限公司
GUASS SPECIAL METAL PRODUCT CORP.

● 公司簡介

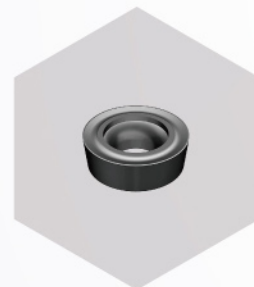
元磁特殊金屬有限公司成立於1990年，從事碳化鎢成形與燒結，1993年開始研製捨棄式刀片之生產，提供優良品質且均一的捨棄式銑刀片予CNC銑床使用，深獲業界信賴及讚美，也因此更積極不斷的投入開發各產業所需求的刀片，舉凡航空、塑膠、機械、食品、汽車、電子等客戶，都是我們的夥伴，在將近數十年餘載，除了曾通過ISO 9001 2000 法國·貝爾的品保認證外，也從未間斷投資各項設備，皆只為供應業界品質優良且均一的捨棄式刀片，協助客戶能順利又穩定的生產，建立長期穩定的合作關係，領航於時代改變的前頭。

故目前廠內可提供各式之車刀片、銑刀片、鑽孔刀片、搪孔刀片、切槽、切斷刀片及各類特殊形式的鎢鋼產品，我們秉持「品質、技術、服務」作為公司經營方針，相信只要配合客戶要求，一起創造業界利潤，就能達成三方皆贏的方向，走向世界的舞台。

● COMPANY PROFILES:

Guass Special Metal Co., Ltd. was established in 1990, engaged in tungsten carbide forming and sintering work. In 1993, we began to produce the carbide inserts and offer high & stable quality milling carbide inserts for CNC milling machines, during this period, we received many excellent feedback and has won the trust and praise of the customer. Therefore, we throw in the development of carbide inserts positively and continually to suit for every industries demand, such as aviation, plastics, machinery, food, automobiles, electronics, etc.... many of them are our partners. In the past few decades, in addition to get the ISO system quality assurance (AFAQ- certification of 9001 2000 Bell of France), we also have never stopped investing in each new equipment, all for the purpose is to supply high & stable quality carbide inserts to the industry, supporting customers the smooth and stable production, and built a long-term and stable cooperative relations. Be ahead of the generation changed.

Therefore, Guass factory can provide all kinds of "turning inserts, milling inserts, drilling inserts, boring inserts, grooving, cutting inserts" and every kinds of special shapes of tungsten carbide products. We uphold "quality, technology, service" as our main business policy, believes that as long as we cooperates with customer requirements and creates industry profits together, it will be able to achieve a win-win direction for all three, and expand to the business to all worldwide.



QUALITY
TECHNOLOGY
SERVICE

技術 · 品質 · 服務

完備的機械設備與量側儀器 COMPLETE MECHANICAL EQUIPMENTS

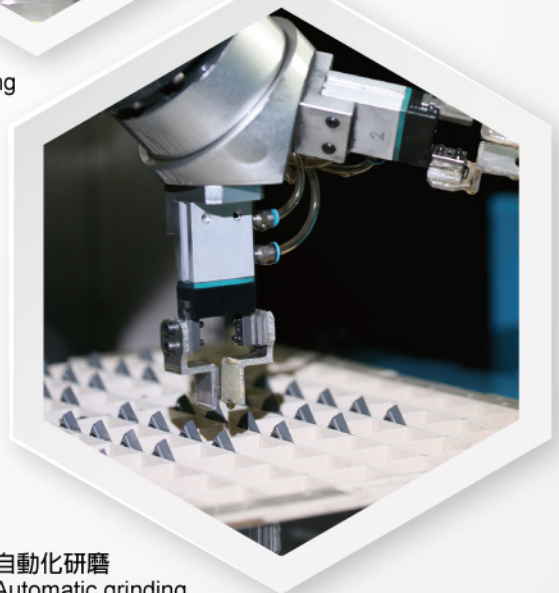
檢驗量測
Inspection
Measurement



多軸研磨
Multi axis grinding
technology

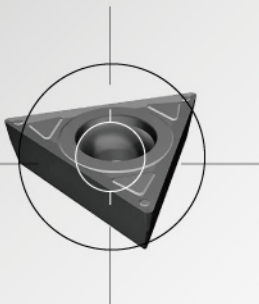


粉末成型
Metallurgy molding
technology



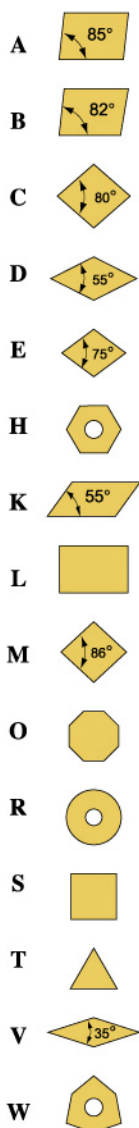
自動化研磨
Automatic grinding
technology

平面研磨
Surface grinding



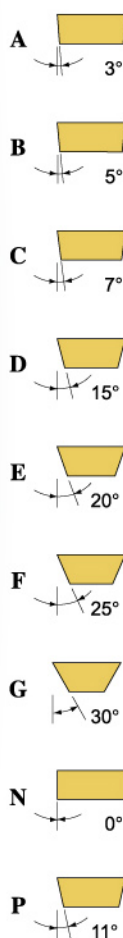
1

刀片形狀
SHAPE INSERT



2

刀片逃角
CLEARANCE ANGLE



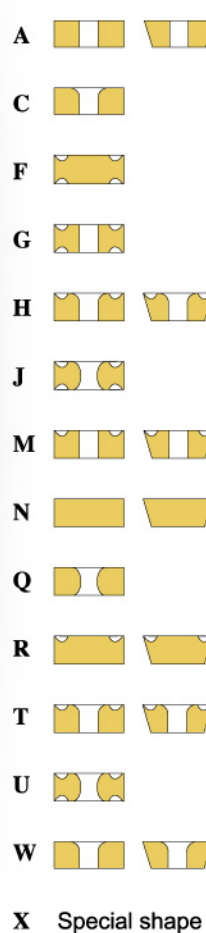
3

刀片公差
TOLERANCES CLASS

	Range of tolerance		
	d ±	m ±	s ±
A	0.025	0.005	0.025
C	0.025	0.013	0.025
E	0.025	0.025	0.025
F	0.013	0.005	0.025
G	0.025	0.025	0.05-0.13
H	0.013	0.013	0.025
J	0.05-0.15	0.005	0.025
K	0.05-0.15	0.013	0.025
L	0.05-0.15	0.025	0.025
M	0.05-0.15	0.08-0.2	0.05-0.13
N	0.05-0.15	0.08-0.2	0.025
U	0.08-0.25	0.13-0.38	0.13

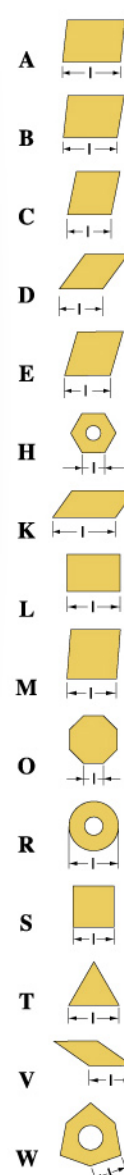
4

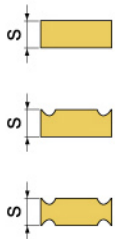
刀片溝孔
INSERT FEATURES



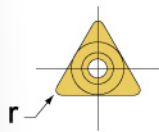
5

刀片邊長
EDGE LENGTH



6刀片厚度
TIP THICKNESS

Index	S(mm)
01	1.59
T1	1.98
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

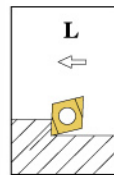
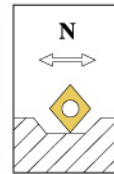
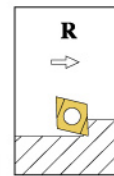
7刀片R角
CORNER RADIUS

Index	S(mm)
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
24	2.4
00	0

00: Round insert (inch)
MO: Round insert (meter)

8刀口角度
CUTTING EDGE

- E** Rounded
- F** Sharp
- T** Chamfered
- S** Chamfers and rounded

9刃口方向
CUTTING DIRECTION**10**排屑溝
CHIP BREAKER

Chip breaker design



● 產品型號說明
ISO Identification

C - **N** - **M** - **G** - **12** - **08** - **04** - **(E)** - **(N)** - **(MS)**

1 **2** **3** **4** **5** **6** **7** **8** **9** **10**



追求卓越 精益求精
Excellent pursuit of Excellence ▶▶▶



自動化生產
Automatic production

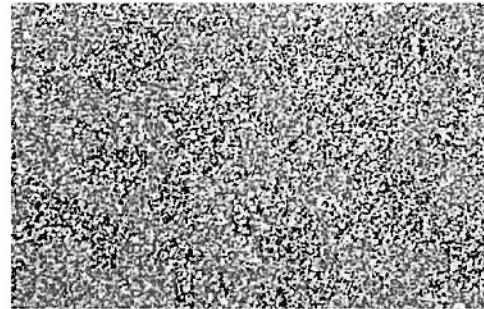


G12XF

硬度 (Hardness) HRA92.7，結晶粒度 (Grain size) $0.5\ \mu\sim 0.6\ \mu$ ，抗折力 TRS 320kg/mm^2 (450ksi)。

極細微粒材質，質地均勻分散碳化鉻微粒，極為優越於加工高強度合金鋼，亦適合研磨銳利刀片。

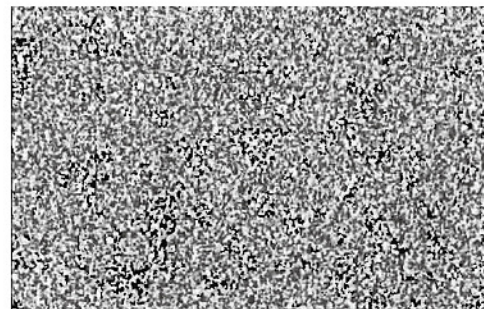
Ultra fine submicron grain size grade carbide, micron chrome carbide distributes in matrix, excels in sharpening cutting edge and machining high strength Alloyed Steel.

**G10CF**

硬度 (Hardness) HRA92，結晶粒度 (Grain size) $0.7\ \mu\sim 0.8\ \mu$ ，抗折力 TRS 290kg/mm^2 (410ksi)。

超微粒材質，結晶粒極為均勻，質地均勻分散碳化鉻微粒，此材質通過美國太空總署航太認證，適合加工高強度航太合金及高強度鎳基合金，亦適合加工工具合金鋼及高強度鑄鐵。

Submicron grain size grade carbide, unique grain structure, micron chrome carbide in matrix, able to retain a sharp cutting edge during the machining of high strength Ni-base alloy and aerospace alloy, also longer tool life for alloyed steel and high strength cast iron.

**G15M**

硬度 (Hardness) HRA91.4，結晶粒度 (Grain size) $1\ \mu\sim 2\ \mu$ ，抗折力 TRS 170kg/mm^2 (240ksi)。

此材質為 P. M 級材質 Tic + Tac 含20%，ISO 規格在M15~M20、P20~P40，由於高含量碳化鉭 (Tac)耐熱性佳，適合於加工碳鋼、不鏽鋼及合金鋼。

This carbide grade is equivalent to ISO grade M15~M20, P20~P40, high Tantalum carbide content, Tic + Tac total content 20%, high heat-resistance. Used in cutting carbon steel, stainless steel and alloyed steel.

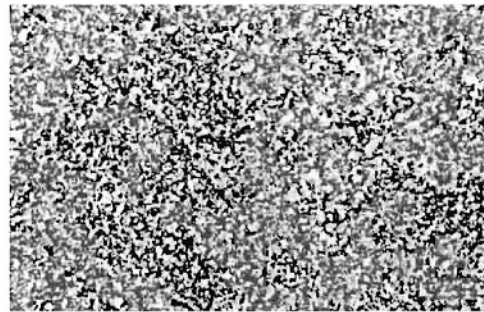
Materials
材料與材質Coating
鍍層Milling Insert
銑刀系列Turning Insert
車刀系列Drilling Insert
鑽刀系列Customized products
特殊系列Blank
素材

G20P

硬度 (Hardness) HRA90.5，結晶粒度 (Grain size) $1\mu\sim2\mu$ ，抗折力TRS 180kg/mm² (255ksi)。

此材質為 PM 級材質，高含鈷量及 Tic+Tac 含量 21%，ISO規格在M20~M30、P20~P30，由於高鈷含量及Tac含量，韌性佳及耐熱性亦佳，適合車、銑碳鋼、合金鋼及不鏽鋼、鑄鐵等。

This carbide grade is equivalent to ISO grade M20~M30, P20~P30 with high cobalt content and high Tantalum carbide content, Tic + Tac total content 21%, good toughness and heat-resistance. Used in machining carbon steel, alloyed steel and stainless steel, cast iron.

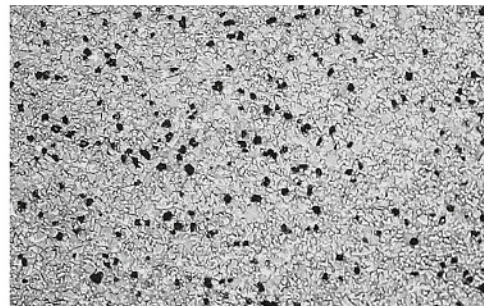
**G40M**

硬度 (Hardness) HRA89，結晶粒度 (Grain size) $1\mu\sim2\mu$ ，抗折力TRS 260kg/mm² (370ksi)。

此材質在ISO規格在M30~M40，由於碳化鉬、碳化鈮顆粒均勻分布在基地上，有良好熱抵抗，適合加工鎳基合金。

This carbide grade is equivalent to ISO grade M30~M40. It contains unique Tantalum carbide particle and Niobium carbide particle in matrix. With high temperature resistance and wear resistance.

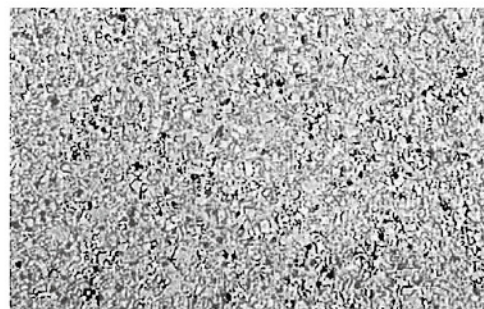
Used in turning and milling high Ni-base alloy.

**G11C**

硬度 (Hardness) HRA89.5，結晶粒度 (Grain size) 1.5μ ，抗折力TRS 250kg/mm² (360ksi)。

此材質碳化鎢結晶大小配比，ISO規格在K20~K30，由於結晶顆粒比，耐衝擊性佳、韌性佳，適合進刀量大加工，經TIN、TICN或TIALN鍍膜適合加工鑽、銑車，刀刃不易崩裂，適合加工碳鋼、合金鋼。

This carbide grade is equivalent to ISO grade K20~K30. Its conglomerate of coarse and fine grain sizes carbide particle, makes its resist high impact with its high toughness and strength. After coated with TIN, TICN or TIALN, it is good for heavy machining such as milling, turning, and drilling carbon steel and alloyed steel.



G10KTA

硬度 (Hardness) HRA92.5，結晶粒度 (Grain size) $1.3\ \mu$ ，抗折力TRS 160kg/mm² (230ksi)。

此材質為ISO規格K10，由於含有部份碳化鉬成份，耐磨性佳，適合加工鑄鐵、非鐵金屬、銅、鋁合金。

This carbide grade is equivalent to ISO grade K10. It contains Tantalum carbide with high wear resistance.

Used in milling and turning cast iron, non-ferrous metal, copper and aluminum alloy.

Materials
材料與材質Coating
鍍層Milling Insert
銑刀系列Turning Insert
車刀系列Drilling Insert
鑽刀系列Customized products
特殊系列Blank
素材**G20H**

硬度 (Hardness) HRA92，結晶粒度 (Grain size) $0.8\ \mu$ ，抗折力TRS 240kg/mm² (340ksi)。

超微粒材質，ISO規格為K10~K20，硬度高、韌性佳，銲接性良好，適合製作端銑刀、鉸刀、銲接倒角刀，適合加工碳鋼、合金鋼、不鏽鋼、鑄鐵、鋁合金及木工刀具。

Submicron grain carbide, equivalent to ISO grade K10~K20, high tension strength, good toughness and good for brazing with steel bar. Used in grinding solid carbide endmill, solid carbide chamfer cutter and solid carbide reamer cutter, also in machining carbon steel, stainless steel, alloyed steel, cast iron, copper, aluminum alloy and wood working tool.

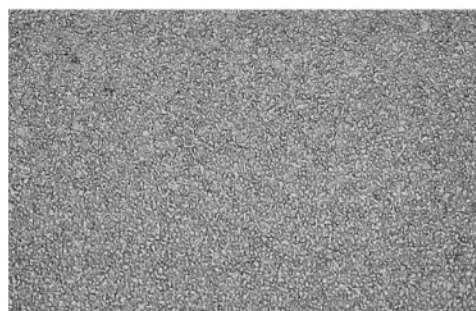
**G6CF**

硬度 (Hardness) HRA93，結晶粒度 (Grain size) $0.6\ \mu\sim 0.8\ \mu$ ，抗折力TRS 211kg/mm² (300ksi)。

此材質為ISO K05，由於含有碳化鈮及碳化鉻有良好的熱抵抗及耐磨耗，適合加工合金鋼、鑄鐵合金鑄鐵及車削航太合金材料、。

This carbide grade is equivalent to ISO grade K05. With Vanadium carbide and Chromium carbide content.

High temperature resistance and wear resistance. Used to machine alloy steel, cast iron, alloyed cast iron and aerospace alloy.



物理蒸鍍 Physical Vapor Deposit

• 所有鍍層皆為PVD • All of our coating layers are implemented by means of PVD technology.

鍍層名稱 Coating Layer	物 理 性 質					應 用 範 圍 Application
	微硬度 Micro-hardness HV(50g)	顏 色 Coating Color	耐氧化溫度 Max. Working Temperature	厚 度 Thickness	特 性 Key Characteristics	
TiN	2000	金黃色 Gold	600°C	3 μ	良好泛用性，潤滑性佳。 Good general cutting used, good lubrication.	適合車、銑碳鋼及不鏽鋼。 Turning, milling carbon steel, stainless steel.
TiCN	3000	灰色 Gray	400°C	3 μ	硬度高、耐磨耗、韌性佳。 High hardness, good wear resistance, enhanced toughness.	適合車碳鋼、合金鋼。 Turning, carbon steel, alloyed steel.
GSS+ (TiSiN)	3800	古銅色 Bronze	1000°C	4 μ	進化版的矽鈦，更高的耐磨性，硬度、韌性、親和性、緊密性 Advanced TiSiN coated, improved hardness, toughness, adhesion and inertness. Improved fracture resistance and chipping resistance.	泛用性極佳，適合加工鋼鐵，例如合金工具鋼、鉻鋼等。 Wide application and universal use. Used in machining steel such as carbon steel, stainless steel, alloyed steel.
GSU+ (TiSiN)	3700	紫灰色 Violet-Gray	1100°C	4 μ	超硬奈米矽鈦多層低摩擦細數、高抗氧化溫度不易黏屑抗熱裂及抗氧化 Multilayer, nanolayer Low friction coefficient Reduce built-up edge Improved resistance to thermal cracks and oxidation.	易黏屑的材料如不鏽鋼、快削鋼、鉻鋼等 Reliable performance in machining stainless steel, free-cutting steel, chromium-vanadium steel, etc.

物理蒸鍍 Physical Vapor Deposit

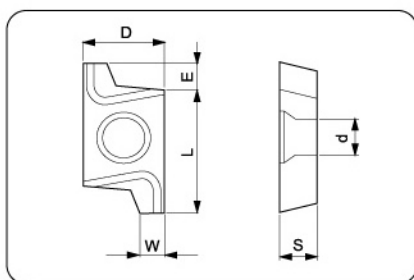
• 所有鍍層皆為PVD • All of our coating layers are implemented by means of PVD technology.

鍍層名稱 Coating Layer	物理性質					應用範圍 Application
	微硬度 Micro-hardness HV(50g)	顏色 Coating Color	耐氧化溫度 Max. Working Temperature	厚度 Thickness	特性 Key Characteristics	
GSA+ (TiSiN)	4300	古銅色 Bronze	1200°C	3 μ	耐熱溫度高，抗氧化性好，泛用性高 High heat resistant temperature, high antioxidant, for most kinds of material.	適合溼式及乾式切削： 20-40度加工。 Suit for wet & dry machining and hardness is around 20-40 hrc.
AiTIN+	3300	紫黑色 Violet-Black	800°C	3 μ	泛用性高，含高鋁，抗熱性高 Universal purposes With higher Al content and heat resistance.	高效能乾切，可用於加工鑄鐵等 Dry high-performance machining. Used in machining cast iron, etc.
S+ (AlTiN)	3400	亮鐵灰色 Anthracite	900°C	3 μ	熱處理、高硬度、高抗氧化性、高耐磨耗 Suit for heat treatment and high hardness material, high antioxidation and strong wear resistance.	因其傑出的耐熱及耐磨特性，適合難加工材料。乾式高速銑削硬料(大於54HRC之鋼鐵)或難磨削之材質時有相當好的效果。 Machining under extreme conditions, with outstanding thermal and mechanical loading capacity. High-performance machining of very abrasive or hard materials (steel hardness > 54 HRC) in dry high-speed machining application, dry machining would be better performance.
E+ (AlTiN)	3300	黑色 Dark	800°C	3 μ	熱處理、高低硬度、高抗氧化性、高硬度、低熱傳導係數 Suit for heat treatment, most kinds of material, high antioxidation, high hardness, and low heat conduction coefficient.	適合加工難切削之材料、硬化鋼、硬化材料。 適合環境：乾式切削、半乾燥。 Used in hard cutting and in the high-performance machining. Processing of hardened steel and abrasive material. Semi-dry (MMS) or dry processing.

Materials
材料與材質Coating
鍍層Milling Insert
銑刀系列Turning Insert
車刀系列Drilling Insert
鑽刀系列Customized products
特殊系列Blank
素材

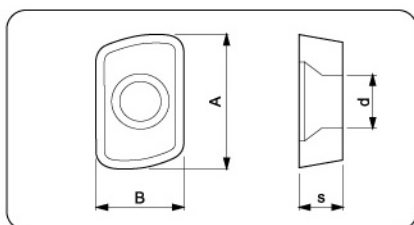


ARGT直角端銑刀 Shoulder End Miller ARGT Inserts



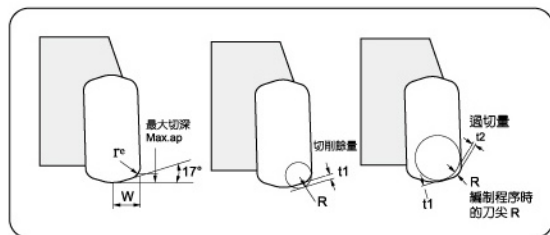
刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension					
			D	S	d	E	W	L
	GW1871-NC	RTH070204-NC	4.3	2.38	2.20	1.50	1.30	8.05

AEPR圓角銑刀 Radius End Miller AEPR Inserts



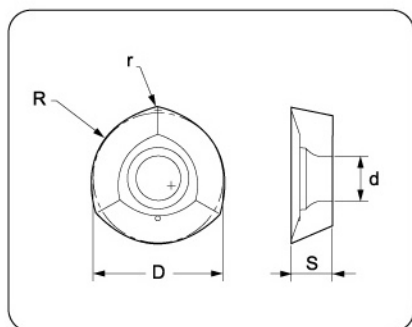
刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension			
			A	B	s	d
	GW1554-1	EPMW060308-MO	10.0	6.35	3.18	2.9
	GW1554	EPMT060308-MP	10.0	6.35	3.18	2.9
	GW1555	EPMT060308-FT	10.0	6.35	3.18	2.9

ENHU高進給銑刀 High Feed Milling cutter



* 尺寸圖請參考上圖AEPR圓角銑刀 Dimention refer to AEPR Inser Above.

刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			A	B	s	d	R1
	GW1863-1	LNMU030312-TU	11.6	6.0	4.30	2.90	-
	GW1936	LOGU030310-KY	11.9	6.2	4.88	3.44	0.9
	GW1946	ENMU100412-DJ	10.0	6.0	4.00	3.04	1.2
	GW1946-NC	ENHU100412-DJ	10.0	6.0	4.00	3.04	1.2
	GW1948	ENMU060318-HI	10.0	6.0	4.20	2.80	1.8
	GW1948-NC	ENHU060318-HI	10.0	6.0	4.20	2.80	1.8



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			D	S	d	R	r
	GW1135 6R	QPMT0903-6R-FW	9.52	3.18	3.40	5.796	0.40
	GW1069 8R	QPMT12T3-8R-FW	12.70	3.97	4.40	7.720	0.40
	GW1134 10R	QPMT1504-10R-FW	15.87	4.76	4.40	9.660	0.40

加工條件 Machining Condition Guide

加工材質 Machined Material	材質硬度 (HB) Material Hardness	切削速度 (Vc) m/min	進給 Feed mm/tooth
碳鋼 Carbon steel	180~280	180~310	0.1~0.15
合金鋼 Alloyed steel	180~280	180~310	0.1~0.15
高合金鋼 High alloyed steel	200~300	130~230	0.05~0.15
不鏽鋼 Stainless steel	260以下	180~310	0.05~0.15
灰口鑄鐵 Gray cast iron	FC25以下 HB220以下	180~310	0.1~0.2
球墨鑄鐵 Ductile cast iron	FCD45 HB160以下	140~240	0.1~0.2
	FCD55 HB210以下	100~200	0.05~0.15

Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

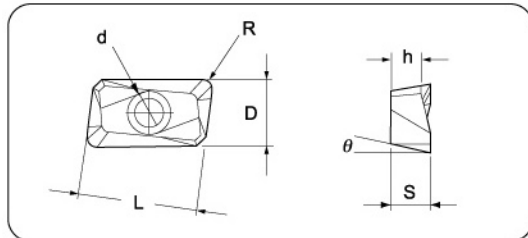
Turning Insert
車刀系列

Drilling Insert
鑽刀系列

Customized products
特殊系列

Blank
素材

I 直角端銑刀片 (正面直角加工; 肩削加工) Inserts for Shoulder Cutter and Long Edge Cutter



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension					
			L	D	S	θ	r	d
	GW1317-1	APMT1604-MS	16.5	9.5	4.76	11°	0.8	4.5
	GW713	APMT1604-HS	16.5	9.5	4.76	11°	0.8	4.5
	GW1738	APMT160408-T2	16.5	9.5	4.76	11°	0.8	4.5
	GW1271	APMT1135-MS	11.0	6.3	3.50	11°	0.8	2.7
	GW1699	APMT1135-HS	11.0	6.3	3.50	11°	0.8	2.7
	GW1607	APMT11T308-SV	11.0	6.8	3.59	11°	0.8	2.8
	GW1387	APHT1003-AL	11.3	6.6	3.60	11°	0.4	2.7
	GW1369-1	APHT1604-AL	16.5	9.5	4.76	11°	0.8	4.4
	GW2008	XOMT060204	6.4	4.0	2.40	15°	0.4	1.9
	GW2009	XOMT060208	6.4	4.0	2.40	15°	0.8	1.9

■ 技術資料 Technical Information

1. 切削速率(轉速)與工作進盤給關係
Relationship between cutting speed (RPM)
and working table speed.

轉速 (RPM) x 齒數 (Tooth) x 0.3~0.5
= 工作盤進給速率 (mm/min)
RPM x Number of tooth x 0.3~0.5
= Work table feed speed (mm/min)

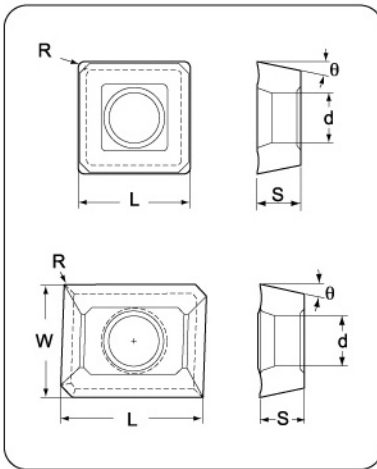
2. 加工速率 V_c (m/min) , 刀具外徑 D (mm)

$$RPM = \frac{V_c \times 100}{D \times \pi}$$

RPM = 主軸轉速 Spindle speed

■ 加工條件 Machining Condition Guide

加工材質 Machined Material	切削速率 V_c Cutting Speed (m/min)	進給 Feed mm/齒 (mm/tooth)
碳 鋼 Carbon steel	120 ~ 250	0.06 ~ 0.12
合金鋼 Alloyed steel	110 ~ 160	0.06 ~ 0.10
不鏽鋼 Stainless steel	110 ~ 160	0.06 ~ 0.10
PH 不鏽鋼 PH Stainless steel	95 ~ 150	0.06 ~ 0.10
鑄 鐵 Cast iron	115 ~ 220	0.06 ~ 0.13
鋁合金 Aluminum alloy	300 ~ 1000	0.04 ~ 0.20
硬化鋼 Hardened steel	30 ~ 60	0.04 ~ 0.10



2 螺旋型端銑刀片

Insert for Helical End Miller and Heavy Duty Helical Slop Rough Milling



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension					
			L	W	S	R	θ	d
	GW727	SDMT090308-SP	9.52	--	3.20	0.80	15°	4.50
	GW206	SPMT120408-TP	12.70	--	4.76	0.80	11°	5.60
	GW734	ADMT150308-SAP	15.00	9.52	3.20	0.80	15°	4.50
	GW724	APMT150422R-SAP	15.84	12.70	4.76	1.20	11°	5.60

技術資料 Technical Information

加工條件 Machining Condition Guide

進給調整係數

$$f_z = f_s \times k_{ap} \times k_{ae}$$

$$k_{ap} = a_p / L_c$$

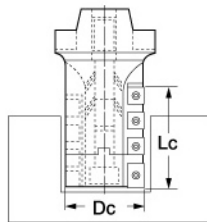
$$k_{ae} = a_e / D_c$$

a_p = 切深
depth of cut

a_e = 切寬度
width of cut

L_c = 刃長
length of flute

D_c = 刃寬度
diameter of cutter



a_p/L_c	k_{ap}	a_e/D_c	k_{ae}
6	1.0	1/1	1.0
9	1.0	1/2	1.0
12	1.0	1/5	1.1
0.5x D_c	1.0	1/10	1.2
1x D_c	0.7	1/20	1.3
$a_p=L_c$	0.5		

加工材質 Machined Material	加工速度 V_c $a_p/a_e=1$ Speed m/min (刀徑d)					進給 f_s Feed mm/tooth
	ø40	ø50	ø63	ø80	ø100	
碳鋼 Carbon steel	70~150	70~150	70~150	70~150	70~150	0.015~0.2
合金鋼 Alloyed steel	60~100	60~120	60~120	60~120	60~120	0.10~0.15
不鏽鋼 Stainless steel	60~100	60~120	60~120	60~120	60~120	0.06~0.1
鑄鐵 Cast iron	60~150	60~150	60~150	60~120	60~120	0.15~0.25
鋁合金 Aluminum alloy	200~500	200~500	200~500	200~500	200~500	0.06~0.12

Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

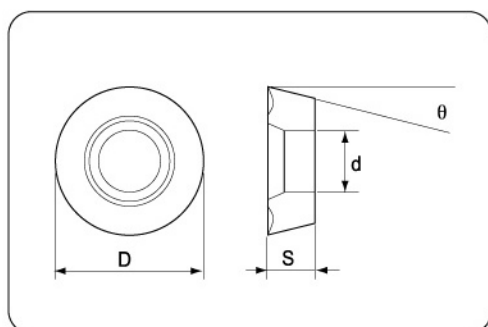
Turning Insert
車刀系列

Drilling Insert
鑽刀系列

Customized products
特殊系列

Blank
素材

3 圓刀端銑刀 Contour Milling Cutter Inserts



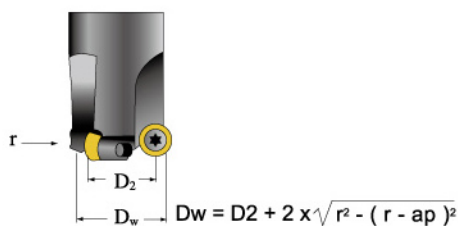
刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension			
			D	d	S	θ
	GW1597A 2.5R	RDMW0501-MO	5.00	2.20	1.50	15°
	GW1382 3.5R	RDMW0702-MO	7.00	2.72	2.38	15°
	GW1149-1 4R	RDMW0802-MO	8.00	3.40	2.48	15°
	GW1638 5R	RDMW1003-MO	10.00	4.60	3.18	15°
	GW690-1 5R	RDMW10T3-MO	10.00	4.55	3.97	15°
	GW1066 6R	RDMW1204-MO	12.00	4.40	4.76	15°
	GW717-1 8R	RDGW1604-MO	16.00	5.50	4.76	15°
	GW1610-1 8R	RDMW1604-MO	16.00	5.50	4.76	15°
	GW546 5R	RPMW1003-MO	10.00	4.60	3.18	11°
	GW1502-1 6R	RPMW1204-MO	12.00	4.40	4.76	11°
	GW1149 4R	RDMT0802-MS	8.00	3.40	2.48	15°
	GW690 5R	RDMT10T3-MS	10.00	4.55	3.97	15°
	GW1066-1 6R	RDMT1204-MS	12.00	4.40	4.76	15°
	GW717 8R	RDGT1604-MS	16.00	5.50	4.76	15°
	GW1610 8R	RDMT1604-MS	16.00	5.50	4.76	15°
	GW1336 6R	RPGW1204-MT	12.00	4.40	4.76	11°
	GW1502 6R	RPMT1204-MS	12.00	4.40	4.76	11°
	GW1063 7R	RCMT14T3-MS	14.00	3.50	4.00	7°



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension			
			D	d	S	θ
	GW1382A 3.5R	RDHT0702-AL	7.00	2.80	2.38	15°
	GW1149-1NC 4R	RDHT0802-AL	8.00	3.40	3.20	15°
	GW1577 5R	RDHT1003-AL	10.00	4.55	3.18	15°
	GW1651 5R	RCHT1003-AL	10.00	4.40	3.18	7°
	GW1650 5R	RCHT10T3-AL	10.00	4.40	3.97	7°
	GW1650-1 5R	RPHT10T3-AL	10.00	4.40	3.97	11°
	GW1066-NC 6R	RDHT1204-AL	12.00	-	4.76	15°
	GW1578 8R	RDHT1604-AL	16.00	5.50	4.76	15°

技術資料 Technical Information

加工條件 Machining Condition Guide



D_w: 工件加工後直徑
Working diameter

D₂: 固定刀片間距
Diameter of cutting inserts
center to center

r: 刀片半徑 Insert radius

ap: 加工切深 Axial depth of cut

加工材質 Machined Material	粗銑 Semi-Finish		精銑 Finish	
	加工速率 Speed Vc m/min	進給 Feed f mm/tooth	加工速率 Speed Vc m/min	進給 Feed f mm/tooth
碳鋼 Carbon steel	180~260	0.15~0.25	200~300	0.10~0.15
合金鋼 Alloyed steel	100~160	0.10~0.20	100~200	0.08~0.10
不鏽鋼 Stainless steel	120~180	0.10~0.15	150~220	0.08~0.10
鑄鐵 Cast iron	180~260	0.12~0.25	200~350	0.08~0.15
鋁合金 Aluminum alloy	400~750	0.05~0.10	700~1000	0.04~0.08
硬化鋼 Hardened steel	-	-	50~100	0.03~0.08

Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

Turning Insert
車刀系列

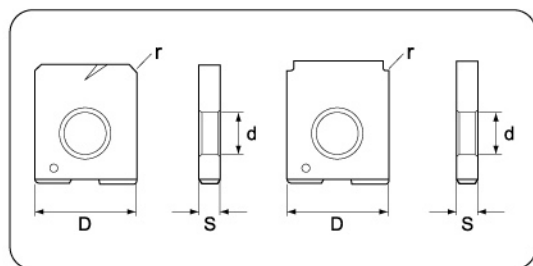
Drilling Insert
鑽刀系列

Customized products
特殊系列

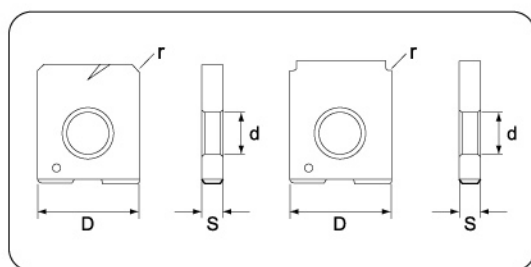
Blank
素材



R 角精銑刀 Radius Precision Inserts for End Miller (Outer radius and Inner radius)



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			D	S	d	L	r
	GW1397-OR-FN08R	WPOV12-FN08R	12.0	2.5	5.0	14.0	0.8
	GW1397-OR-FN10R	WPOV12-FN10R	12.0	2.5	5.0	14.0	1.0
	GW1397-OR-FN20R	WPOV12-FN20R	12.0	2.5	5.0	14.0	2.0
	GW1397-OR-FN30R	WPOV12-FN30R	12.0	2.5	5.0	14.0	3.0
	GW1478-OR-FN10R	WPOV16-FN10R	16.0	3.0	5.0	16.0	1.0
	GW1478-OR-FN20R	WPOV16-FN20R	16.0	3.0	5.0	16.0	2.0
	GW1478-OR-FN30R	WPOV16-FN30R	16.0	3.0	5.0	16.0	3.0
	GW1478-OR-FN40R	WPOV16-FN40R	16.0	3.0	5.0	16.0	4.0
	GW1479-OR-FN10R	WPOV20-FN10R	20.0	3.0	5.0	18.0	1.0
	GW1479-OR-FN20R	WPOV20-FN20R	20.0	3.0	5.0	18.0	2.0
	GW1479-OR-FN30R	WPOV20-FN30R	20.0	3.0	5.0	18.0	3.0
	GW1479-OR-FN40R	WPOV20-FN40R	20.0	3.0	5.0	18.0	4.0
	GW1479-OR-FN50R	WPOV20-FN50R	20.0	3.0	5.0	18.0	5.0
	GW1397-OR-FS08R	WPOV12-FS08R	12.0	2.5	5.0	14.0	0.8
	GW1397-OR-FS10R	WPOV12-FS10R	12.0	2.5	5.0	14.0	1.0
	GW1397-OR-FS20R	WPOV12-FS20R	12.0	2.5	5.0	14.0	2.0
	GW1397-OR-FS30R	WPOV12-FS30R	12.0	2.5	5.0	14.0	3.0



Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

Turning Insert
車刀系列

Drilling Insert
鑽刀系列

Customized products
特殊系列

Blank
素材

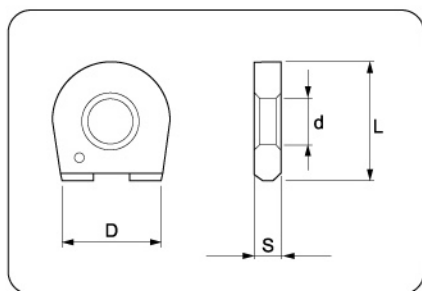
刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			D	S	d	L	r
	GW1397-IR-FN08R	WPIV12-FN08R	12.0	2.5	5.0	14.0	0.8
	GW1397-IR-FN10R	WPIV12-FN10R	12.0	2.5	5.0	14.0	1.0
	GW1397-IR-FN20R	WPIV12-FN20R	12.0	2.5	5.0	14.0	2.0
	GW1397-IR-FN30R	WPIV12-FN30R	12.0	2.5	5.0	14.0	3.0
	GW1478-IR-FN10R	WPIV16-FN10R	16.0	3.0	5.0	16.0	1.0
	GW1478-IR-FN20R	WPIV16-FN20R	16.0	3.0	5.0	16.0	2.0
	GW1478-IR-FN30R	WPIV16-FN30R	16.0	3.0	5.0	16.0	3.0
	GW1478-IR-FN40R	WPIV16-FN40R	16.0	3.0	5.0	16.0	4.0
	GW1479-IR-FN10R	WPIV20-FN10R	20.0	3.0	5.0	18.0	1.0
	GW1479-IR-FN20R	WPIV20-FN20R	20.0	3.0	5.0	18.0	2.0
	GW1479-IR-FN30R	WPIV20-FN30R	20.0	3.0	5.0	18.0	3.0
	GW1479-IR-FN40R	WPIV20-FN40R	20.0	3.0	5.0	18.0	4.0
	GW1479-IR-FN50R	WPIV20-FN50R	20.0	3.0	5.0	18.0	5.0

加工條件 Machining Condition Guide

加工材質 Machined Material	粗銑 Semi-Finish		精銑 Finish	
	加工速率 Vc Speed	進給 Fz Feed	加工速率 Vc Speed	進給 Fz Feed
碳鋼 Carbon steel	170~230	0.1~0.3	170~230	0.10~0.15
合金鋼 Alloyed steel	110~200	0.1~0.3	170~250	0.10~0.15
不鏽鋼 Stainless steel	110~200	0.1~0.3	180~235	0.08~0.12
鑄鐵 Cast iron	150~270	0.1~0.3	265~275	0.08~0.12
硬化鋼 Hardened steel	-	-	45~90	0.03~0.06



WGR 球型精銑刀 Inserts WGR Type Ball Nose End Mills



刀片槽型 Insert shape	訂購編號 Ordering Code		刀片規格 Insert ISO Code	尺寸 Dimension			
				D	S	d	L
	GW1295-FS	4R	WGR04-FS	8.0	2.0	3.0	9.5
	GW1294-FS	5R	WGR05-FS	10.0	2.5	4.0	11.5
	GW1293-FS	6R	WGR06-FS	12.0	2.5	5.0	12.0
	GW648-FS	8R	WGR08-FS	16.0	3.0	5.0	14.0
	GW1299-FS	10R	WGR10-FS	20.0	3.0	5.0	16.0
	GW1337-FS	12.5R	WGR12.5-FS	25.0	4.0	6.0	21.5
	GW1504-FS	15R	WGR15-FS	30.0	5.0	8.0	25.0
	GW1476-FS	16R	WGR16-FS	32.0	6.0	8.0	26.0
	GW1295-F	4R	WGR04-F	8.0	2.0	3.0	9.5
	GW1294-F	5R	WGR05-F	10.0	2.5	4.0	11.5
	GW1293-F	6R	WGR06-F	12.0	2.5	5.0	12.0
	GW648-F	8R	WGR08-F	16.0	3.0	5.0	14.0
	GW1299-F	10R	WGR10-F	20.0	3.0	5.0	16.0
	GW1337-F	12.5R	WGR12.5-F	25.0	4.0	6.0	21.5
	GW1504-F	15R	WGR15-F	30.0	5.0	8.0	25.0
	GW1476-F	16R	WGR16-F	32.0	6.0	8.0	26.0

技術資料 Technical Information

加工條件 Machining Condition Guide

$D_w = 2 \times \sqrt{r^2 - (r - ap)^2}$
 D_w : 工件加工後直徑 Working diameter
 r : 刀片半徑 Insert radius
 ap : 加工切深 Axial depth of cut

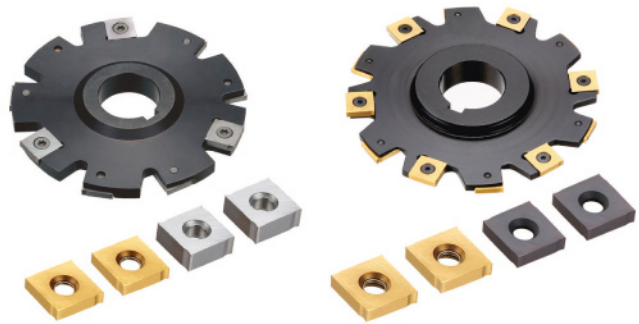
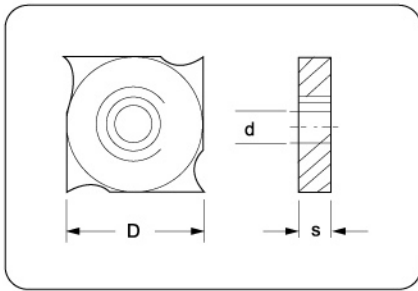
每齒進給(Feed) f_z mm/tooth 平均切屑厚度(h_m) mm

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - ap)^2}}{r} \times \frac{\sqrt{r^2 - (r - ap)^2}}{r}}$$

$$h_m = \frac{\sqrt{r^2 - (r - ap)^2}}{r} \times \frac{\sqrt{r^2 - (r - ap)^2}}{r}$$

f_z : 每齒進給 Feed per tooth a_e : 橫向圓弧切深 Radial depth of cut
 h_m : 平均切屑厚度 Average chip thickness

加工材質 Machined Material	粗銑(Semi-Finish)		精銑 (Finish)	
	加工速率 Vc Speed	進 給 Fz Feed	加工速率 Vc Speed	進 給 Fz Feed
碳鋼 Carbon steel	150~250	0.1~0.3	180~300	0.10~0.15
合金鋼 Alloyed steel	110~200	0.1~0.3	140~240	0.10~0.15
不鏽鋼 Stainless steel	110~200	0.1~0.3	120~200	0.08~0.12
鑄 鐵 Cast iron	90~140	0.1~0.3	100~160	0.08~0.12
硬化鋼 Hardened steel	-	-	50~100	0.03~0.06



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension		
			D	d	s
	GW1034A T3.2	SNFX-1203	12.7	5.0	3.20
	GW1034B T4.0	SNFX-1204	12.7	5.0	4.00
	GW1034B T4.5	SNFX-12045	12.7	5.0	4.50
	GW1034B T5.4	SNFX-1205	12.7	5.0	5.40
	GW1034B T7.0	SNFX-1207	12.7	5.0	7.00
	GW1035 T2.3	SNFX-1102	11.0	3.7	2.30
	GW1035 T3.2	SNFX-1103	11.0	3.7	3.20

技術資料 Technical Information

加工條件 Machining Condition Guide

$$h_m = \frac{\sqrt{ar}}{D \times f_z}$$

f_z = 每齒進給 Feed per tooth

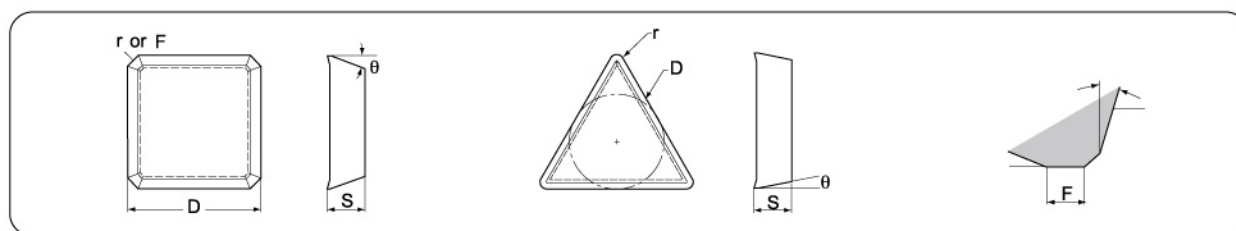
D = 刀具直徑 (Cutter diameter)

ar = 切深 Depth of cut

h_m = 鐵屑厚度 Effective chip thickness

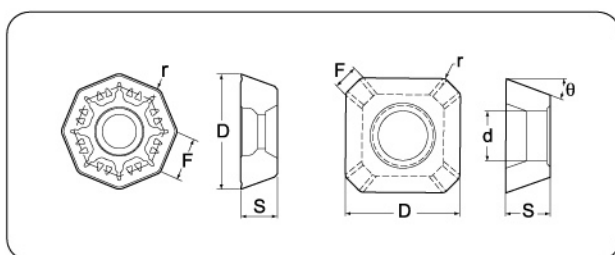
加工材質 Machined Material	加工速率 Vc Speed (m/min)	進給 h_m Feed (mm)
碳鋼 Carbon steel	180~220	0.10~0.14
合金鋼 Alloyed steel	70~110	0.10~0.12
不鏽鋼 Stainless steel	120~140	0.10~0.12
PH 不鏽鋼 PH Stainless steel	55~70	0.12~0.20
鑄鐵 Cast iron	140~280	0.10~0.12
鋁合金 Aluminum alloy	275~450	0.04~0.12
高溫合金 High temp alloys	25~30	0.05~0.10

I 平面銑刀片 Face Milling



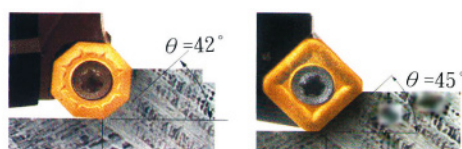
刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension					
			D	L	S	F	r	θ
	GW175-445	SEKN1203-AFTN	12.70	-	3.18	1.40	-	20°
	GW145-545	SEKN1504-AFTN	15.87	-	4.76	1.40	-	20°
	GW1270	SECN1904-AFN	19.04	-	4.76	3.80	-	20°
	GW116-525	SPKN1504-PPTR	15.87	-	4.76	1.40	-	11°
	GW258-425	SPKN1203-PPTR	12.70	-	3.18	1.40	-	11°
	GW258-42508	SPUN120308	12.70	-	3.18	1.40	0.8	11°
	GW176-435	SPKN1204-PPTR	12.70	-	4.76	1.40	-	11°
	GW895	SFKN1504-AFTN	15.87	-	4.76	1.70	-	25°
	GW257-322	TPKN1603-PPTR	9.52	-	3.18	1.40	-	11°
	GW182-433	TPKN2204-PPTR	12.70	-	4.76	1.40	-	11°
	GW257-32208	TPUN160308	9.52	-	3.18	-	0.8	11°
	GW182-43312	TPUN220412	12.70	-	4.76	-	1.2	11°

2 高進給銑刀片 OE/OD/ON/SE/WD High Speed Feed Rate Inserts



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			D	S	F	r	θ
	GW784	OEMX12T3-PAT	12.70	4.00	6.00	0.8	20°
	GW784A	OEHW12T3-MO	12.70	4.00	6.00	0.8	20°
	GW1188	ODMX1204-PAT	12.70	4.76	6.00	0.8	15°
	GW1188-1	ODMW1204-MO	12.70	4.76	6.00	0.8	15°
	GW1549N	ONMU1305-SW	13.00	5.50	5.00	0.4	0°
	GW1644	ONGU1305-SWT	13.00	5.50	5.00	0.8	0°
	GW1370-1	SEGW1204ADTR-MO	12.70	4.76	-	-	20°
	GW859	SEMW1204ADTR-MO	12.70	4.76	-	-	20°
	GW859B-A	SEMT1204ADTR	12.70	4.76	-	-	20°
	GW859B	SEMT1204-B	12.70	4.76	-	-	20°
	GW1802	SEHT13T3-AL	13.40	3.97	2.1	0.8	20°
	GW1643	SEMT13T3ADR-SWU	13.40	3.97	1.8	0.8	20°
	GW1643-NC	SEHT13T3-AL	13.40	3.97	2.1	0.8	20°
	GW1631	WDNW120420-MO	12.00	4.76	-	2.0	15°

■ 技術資料 Technical Information



CNC設定進給 CNC programmed feed rate

$$\frac{h_m}{\sin \theta} = \frac{f h_m}{0.707} = \frac{0.08}{0.707} = 0.113 \text{ mm}$$

■ 加工條件 Machining Condition Guide

加工材質 Machined Material	粗銑 Semi-Finish		精銑 Finish	
	加工速率 Speed Vc m/min	進給 Feed f mm/tooth	加工速率 Speed Vc m/min	進給 Feed f mm/tooth
碳鋼 Carbon steel	180~220	0.3~0.7	220~300	0.08~0.15
合金鋼 Alloyed steel	70~110	0.2~0.5	100~200	0.08~0.15
不鏽鋼 Stainless steel	90~130	0.2~0.5	170~220	0.05~0.10
鑄鐵 Cast iron	150~290	0.2~0.5	200~350	0.05~0.15
鋁合金 Aluminum alloy	270~450	0.2~0.35	700~1000	0.05~0.15
硬化鋼 Hardened steel	-	-	50~100	0.03~0.06

Materials
材料與材質

Coating
鍍層

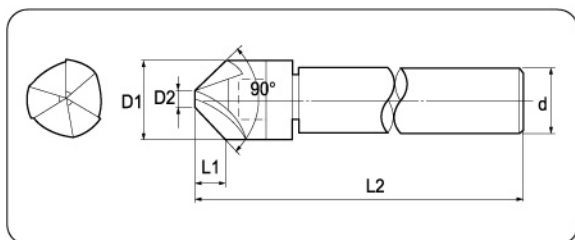
Milling Insert
銑刀系列

Turning Insert
車刀系列

Drilling Insert
鑽刀系列

Customized products
特殊系列

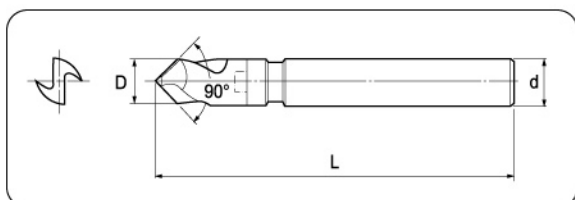
Blank
素材



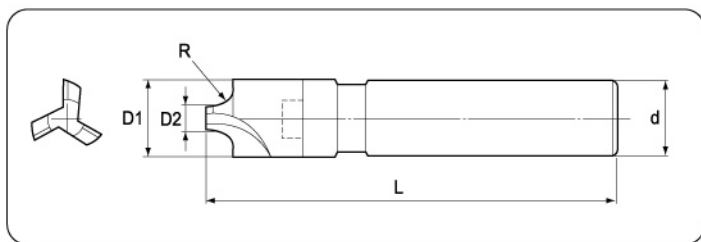
訂購編號 Ordering Code	材質-鍍層 Grade-Coating	刃 數 Flute No.	尺寸 Dimension				
			D1	D2	L1	L2	d
CKEM-6	G20H-TIN	3 Flute	6	1.50	3.50	50	6
CKEM-12	G20H-TIN	3 Flute	12	2.80	4.60	60	10
CKEM-16	G20H-TIN	3 Flute	16	3.20	6.40	64	10
CKEM-20	G20H-TIN	3 Flute	20	3.50	8.25	56	12
CKEM-25	G20H-TIN	3 Flute	25	3.80	10.60	74	12
CKEM-30	G20H-TIN	3 Flute	30	3.80	13.10	80	12

整體碳化鎢銲接中心鑽頭

Solid Carbide Head Center Driller-brazed Alloyed Steel Shank



訂購編號 Ordering Code	材質-鍍層 Grade-Coating	刃 數 Flute No.	尺寸 Dimension		
			D	L	d
CBCM-12	G20H-TIN	2 Flute	12	94	12
CBCM-16	G20H-TIN	2 Flute	16	99	16
CBCM-20	G20H-TIN	2 Flute	20	103	20
CBCM-25	G20H-TIN	2 Flute	25	105	25



Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

Turning Insert
車刀系列

Drilling Insert
鑽刀系列

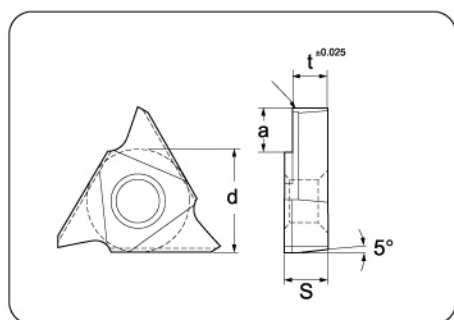
Customized products
特殊系列

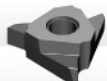
Blank
素材

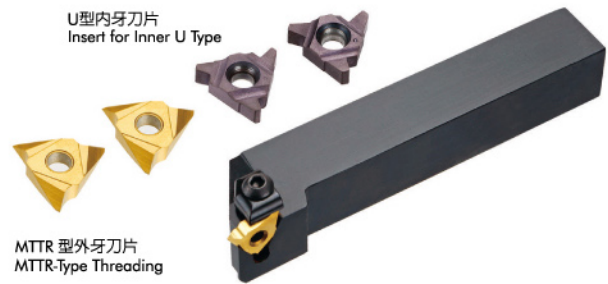
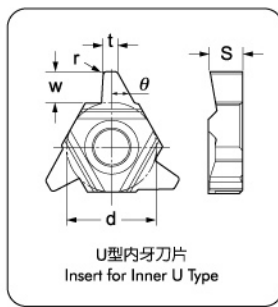
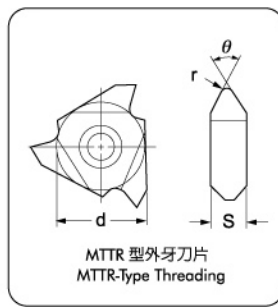
訂購編號 Ordering Code	材質-鍍層 Grade-Coating	刃 數 Flute No.	尺寸 Dimension				
			D1	D2	R	L	d
FEM -12xR1	G20H-TIN	3 Flute	12	8	10	85	12
FEM -12xR1.5	G20H-TIN	3 Flute	12	7	1.5	85	12
FEM -12xR2	G20H-TIN	3 Flute	12	6	2.0	85	12
FEM -12xR2.5	G20H-TIN	3 Flute	12	5	2.5	85	12
FEM -12xR3	G20H-TIN	3 Flute	12	4	3.0	85	12
FEM -16xR3.5	G20H-TIN	3 Flute	16	7	3.5	89	16
FEM -16xR4	G20H-TIN	3 Flute	16	6	4.0	89	16
FEM -16xR5	G20H-TIN	3 Flute	16	4	5.0	89	16
FEM -20xR6	G20H-TIN	3 Flute	20	6	6.0	93	20
FEM -25xR8	G20H-TIN	3 Flute	25	7	8.0	100	25

加工條件 Machining Condition Guide

品 名 Cutter and driller	加 工 材 質 Machined Material	轉 數 VC m/min	進 給 FS mm/rev
倒 角 刀 Chamfer Cutter	不鏽鋼 Stainless steel	20m~25m	0.1
	鋁合金 Aluminum alloy	100m~120m	0.3
	合金鋼 Alloyed steel	25m~30m	0.2
	鑄 鐵 Cast iron	30m~40m	0.2
中 心 鑽 Center Driller	不鏽鋼 Stainless steel	25m~30m	0.08~0.12
	鋁合金 Aluminum alloy	150m~200m	0.5~0.6
	合金鋼 Alloyed steel	40m~50m	0.15~0.2
	鑄 鐵 Cast iron	50m~60m	0.15~0.2
R角銑刀 Corner Radius End Miller	不鏽鋼 Stainless steel	30m~35m	0.1~0.15
	鋁合金 Aluminum alloy	150m~200m	0.5~0.6
	合金鋼 Alloyed steel	50m~60m	0.2~0.3
	鑄 鐵 Cast iron	55m~65m	0.2~0.3



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			d	S	t	a	r
	GW1584 T4.0	MGTR22-400	12.70	4.76	4.00	5.0	0.3
	GW1584 T3.5	MGTR22-350	12.70	4.76	3.50	5.0	0.3
	GW1584-1 T3.0	MGTR22-300	12.70	4.76	3.00	4.0	0.3
	GW1584-1 T2.5	MGTR22-250	12.70	4.76	2.50	4.0	0.3
	GW1584-1 T2.0	MGTR22-200	12.70	4.76	2.00	3.0	0.2
	GW1596 T1.75	MGTR22-175	12.70	4.76	1.75	3.0	0.2
	GW1596 T1.5	MGTR22-150	12.70	4.76	1.50	3.0	0.2
	GW1596 T1.25	MGTR22-125	12.70	4.76	1.25	2.5	0.2
	GW1596 T1.0	MGTR22-100	12.70	4.76	1.00	2.5	0.2
	GW1277 T4.0	MGTL22-400	12.70	4.76	4.00	5.0	0.3
	GW1277 T3.5	MGTL22-350	12.70	4.76	3.50	5.0	0.3
	GW1277-1 T3.0	MGTL22-300	12.70	4.76	3.00	4.0	0.3
	GW1277-1 T2.5	MGTL22-250	12.70	4.76	2.50	4.0	0.3
	GW1277-1 T2.0	MGTL22-200	12.70	4.76	2.00	3.0	0.2
	GW1277-1 T1.75	MGTL22-175	12.70	4.76	1.75	3.0	0.2
	GW1277-1 T1.5	MGTL22-150	12.70	4.76	1.50	3.0	0.2
	GW1277-1 T1.25	MGTL22-125	12.70	4.76	1.25	2.5	0.2
	GW1277-1 T1.0	MGTL22-100	12.70	4.76	1.00	2.5	0.2
	GW874 T3.0	MGTR16-300	9.52	4.76	3.00	3.0	0.3
	GW874 T2.0	MGTR16-200	9.52	4.76	2.00	3.0	0.2
	GW874 T1.5	MGTR16-150	9.52	4.76	1.50	3.0	0.2
	GW874 T1.0	MGTR16-100	9.52	4.76	1.00	1.5	0.2

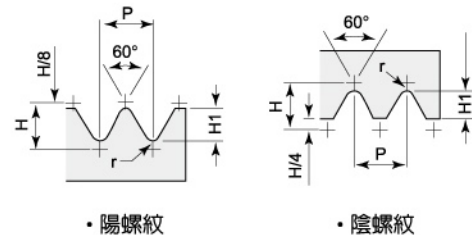


刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension					
			d	S	θ	r	t	w
	GW873-6002	MTTR22-6002	12.70	4.76	60°	0.20	-	-
	GW873-6004	MTTR22-6004	12.70	4.76	60°	0.40	-	-
	GW873-5502	MTTR22-5502	12.70	4.76	55°	0.20	-	-
	GW874-6002	MTTR16-6002	9.52	4.76	60°	0.20	-	-
	GW874-5502	MTTR16-5502	9.52	4.76	55°	0.20	-	-
	GW1713	SAGE-22UIR5.0	12.70	4.76	33°	0.50	1.55	3.65
	GW1713-1	SAGE-22UIR6.0	12.70	4.76	33°	0.50	1.83	4.40

牙刀刃端r角可依客戶要求訂製造(We accept order of changing the radius of cutting edge)

■ 外徑牙刀切削深度及切削次數

P	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50
H1	0.46	0.61	0.77	0.92	1.07	1.23	1.53	1.84	2.15	2.45	2.76
r	0.11	0.14	0.18	0.22	0.25	0.29	0.36	0.43	0.50	0.58	0.65
1	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35	0.40
2	0.13	0.15	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35
3	0.10	0.10	0.12	0.15	0.20	0.20	0.20	0.25	0.25	0.25	0.30
4	0.05	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
5		0.06	0.10	0.10	0.12	0.15	0.15	0.20	0.20	0.25	0.25
6			0.05	0.07	0.10	0.10	0.10	0.15	0.20	0.20	0.20
7					0.05	0.08	0.10	0.15	0.15	0.20	0.20
8						0.05	0.10	0.10	0.15	0.15	0.15
9							0.08	0.10	0.10	0.15	0.15
10							0.05	0.09	0.10	0.10	0.15
11								0.05	0.10	0.10	0.10
12									0.10	0.10	0.10
13										0.05	0.10
14											0.06



■ 加工條件 Machining Condition Guide

加工材質 Machined Material	刀片材質 Insert Material	切削速率 Speed m/min sf	進給 Feed mm/rev
碳 鋼 Carbon steel	G12XF	100~130	0.03~0.1
合金鋼 Alloyed steel	G12XF	135~270	0.03~0.1
不鏽鋼 Stainless steel	G12XF / G20P	50~100	0.05~0.15
球墨鑄鐵 Ductile cast iron	G12XF	115~230	0.05~0.15
灰口鑄鐵 Gray cast iron	G12XF	135~270	0.05~0.15
鋁合金 Aluminum alloy	G11C	245~610	0.05~0.15
高溫合金 High temp alloy	G12XF	20~55	0.03~0.1

加工材質 Machined Material	材質硬度 Material Hardness	切削速率 Vc Cutting speed (m/min)
軟 鋼 Low carbide steel	HB180以下	100~180
碳 鋼 Carbon steel	HB180~280	100~150
合金鋼 Alloyed steel	HB180~280	100~150
不鏽鋼 Stainless steel	HB200以下	80~150
鑄 鐵 Cast iron	HB220以下	60~100

Materials
材料與材質

Coating
鍍層

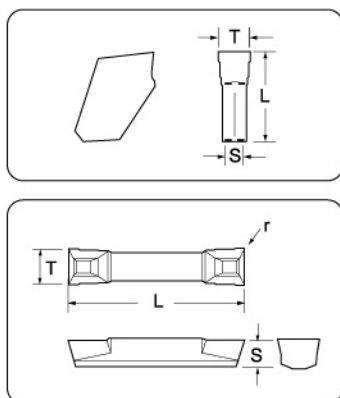
Milling Insert
銑刀系列

Turning Insert
車刀系列

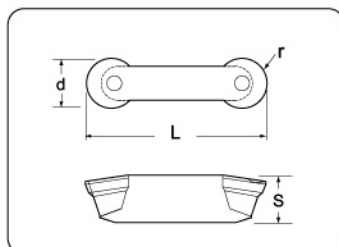
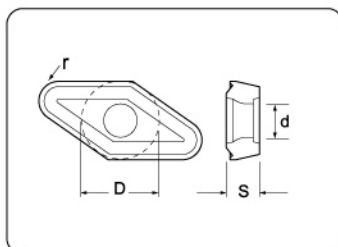
Drilling Insert
鑽刀系列

Customized products
特殊系列

Blank
素材



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension			
			L	S	T	r
	GW1667	GFN3-MT	9.50	2.50	3.0	0.20
	GW1088A	GTN3-MT	10.70	2.50	3.0	0.20
	GW1553	DGM3020CT	20.00	5.00	3.0	0.40
	GW404	DGM4020CT	20.00	5.00	4.0	0.40
	GW1656	DGM5025CT	25.00	6.00	5.0	0.40
	GW1609	DGM3020CTF	20.00	3.00	3.0	0.40
	GW1598	DGM4020CTF	20.00	3.00	4.0	0.40
	GW1657	DGM5025CTF	25.00	5.00	5.0	0.40
	GW1669	DGM3025CE	25.00	5.00	3.0	0.40
	GW1793	DGN3102MT	20.00	6.20	3.08	0.25
	GW1828	DGN2202MT	20.00	6.10	2.18	0.20



Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

Turning Insert
車刀系列

Drilling Insert
鑽刀系列

Customized products
特殊系列

Blank
素材

刀片槽型 Blade shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			D	L	S	d	r
	GW829	GPX-4R.30-AL	-	30.0	7.90	8.00	4.00
	GW888	GPGT190640-DP	15.87	-	6.87	6.90	4.00

加工條件 Machining Condition Guide

加工材質 Machined Material	外徑切削 Turning		切槽 Grooving	
	加工速率 Vc (min)	進給 fs (mm/rev)	加工速率 Vc (min)	進給 fs (mm/rev)
展性鋁合金 (未時效硬化) Malleable alloyed Aluminum (Non-age-harden)	1500~2000	0.1~0.3	800~1000	0.05~0.1
展性鋁合金 (時效硬化) Malleable alloyed Aluminum (Age-harden)	600~900	0.1~0.3	600~700	0.05~0.1
鑄造鋁合金 (未時效硬化) 矽量 < 12% Aluminum cast alloy (Non-age-harden), Si < 12%	700~1000	0.1~0.3	300~600	0.05~0.1
鑄造鋁合金 (時效硬化) 矽量 < 12% Aluminum cast alloy (Age-harden), Si < 12%	400~600	0.1~0.3	250~400	0.05~0.1

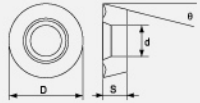
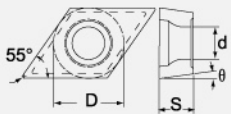
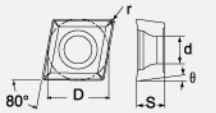
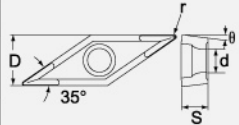
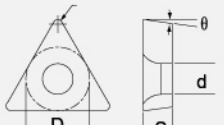


外徑負角車刀片 *Negative Inserts for Turning Outside Dimension*



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				外型 Type
			D	S	r	d	
	GW1608	TNMW110302-MO	6.36	3.18	0.2	3.2	
	GW742-1	TNMG160404-P	9.52	4.76	0.4	3.8	
	GW939	TNMG160406-P	9.52	4.76	0.6	3.8	
	GW821	TNMG160408-P	9.52	4.76	0.8	3.8	
	GW742-2	TNMG160404-SP	9.52	4.76	0.4	3.8	
	GW821-1	TNMG160408-SP	9.52	4.76	0.8	3.8	
	GW739	TNMG220408-SP	12.70	4.76	0.8	5.1	
	GW821-2	TNMG160408-MAT	9.52	4.76	0.8	3.8	
	GW821-3	TNMG160408-MUT	9.52	4.76	0.8	3.8	
	GW821-4	TNMG160408-MUP	9.52	4.76	0.8	3.8	
	GW938	CNMG120404-SP	12.70	4.76	0.4	5.1	
	GW882N	CNMG120408-SP	12.70	4.76	0.8	5.1	
	GW882-1	CNMW120408-MO	12.70	4.76	0.8	5.1	
	GW882-2	CNMG120408L-UP	12.70	4.76	0.8	5.1	
	GW882-3	CNMG120408-MUP	12.70	4.76	0.8	5.1	
	GW1383	SNMG150412-SE	15.84	4.76	1.2	6.2	
	GW1160-1	SNMG120408-SP	12.70	4.76	0.8	5.1	
	GW1846	SNMG190608-SP	19.05	6.35	0.8	7.9	
	GW1278	WNMG080404-SP	12.70	4.76	0.4	5.1	
	GW880-1	WNMG080408-SP	12.70	4.76	0.8	5.1	
	GW880H	WNMG080408-MUP	12.70	4.76	0.8	5.1	
	GW740	DNMG150404-SP	12.70	4.76	0.4	5.1	
	GW974-1	VNMG160404-FP	9.52	4.76	0.4	3.8	
	GW1009	VNMG160408-FP	9.52	5.76	0.8	3.8	



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension					外型 Type
			D	S	r	d	θ	
	GW1651	RCGT1003-MS	10.00	3.18	-	4.4	7°	
	GW1650	RCGT10T3-MS	10.00	3.97	-	4.4	7°	
	GW1650-1	RPGT10T3-MS	10.00	3.97	-	4.4	11°	
	GW1027	DCMW070204-MO	6.35	2.38	0.4	2.8	7°	
	GW1026	DCMW11T302-MO	9.52	3.97	0.2	4.4	7°	
	GW1027-1NC	DCGT070204-FY	6.35	2.38	0.4	2.8	7°	
	GW1026-1NC	DCGT11T302-FY	9.52	3.97	0.2	4.4	7°	
	GW1026A	DCHT11T308-ST	9.52	4.00	0.8	4.5	7°	
	GW1859	DCGT11T302	9.59	4.00	0.2	4.5	7°	
	GW1859-1	DCGT11T304	9.59	4.00	0.4	4.5	7°	
	GW1927-2	CCGT060204-SP	6.35	2.38	0.4	2.8	7°	
	GW766	VCGW160404-MO	9.52	4.76	0.4	4.4	7°	
	GW766-2	VCMW160404-MO	9.52	4.76	0.4	4.4	7°	
	GW1256	VCEW110304-MO	6.35	3.18	0.4	2.8	7°	
	GW1256-1	VCGT110304-FP	6.35	3.18	0.4	2.8	7°	
	GW766-1	VCMT16T404-FP	9.52	4.76	0.4	4.4	7°	
	GW1389	TCMT16T304-ST	9.52	3.97	0.4	4.4	7°	
	GW802	TCGT16T304-ST	9.52	4.00	0.4	4.4	7°	
	GW1155	TCMW090204-MO	5.56	2.38	0.4	2.6	7°	
	GW1389-1	TCMW16T304-MO	9.52	3.97	0.4	4.4	7°	
	GW1431	TCMT16T304-SP	9.52	3.97	0.4	4.4	7°	
	GW1432	TCMT16T308-SP	9.52	3.97	0.8	4.4	7°	

Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

Turning Insert
車刀系列

Drilling Insert
鑽刀系列

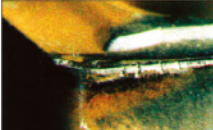
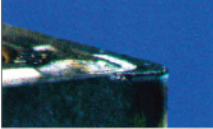
Customized products
特殊系列

Blank
素材

■ 外徑加工條件表 Cutting & Turning Data Suggestion

加工材質 Machined Material	負角刀片 Negative Insert		正角刀片 Positive Insert	
	vc m/min	fn mm/min	vc m/min	fn mm/min
碳鋼 Carbon steel	100~425	0.1~0.5	135~450	0.025~0.25
合金鋼 Alloyed steel	70~250	0.1~0.3	60~200	0.025~0.25
不鏽鋼 Stainless steel	110~300	0.1~0.3	130~300	0.025~0.25
PH不鏽鋼 PH stainless steel	125~450	0.1~0.4	95~175	0.025~0.25
鑄鐵 Cast iron	350~1000	0.25~0.35	180~800	0.05~0.20
鋁合金 Aluminum alloy	25~90	0.1~0.3	25~90	0.025~0.2
硬化鋼 Hardened steel	45~65	0.1~0.3	20~90	0.025~0.2

■ 刀片損壞分析及解決方案

圖示 Pictures	現象 Result	原因 Reason of cause	解決方案 Problem solution
	熱裂 Thermal Cracking	切削速率太高，產生高熱，冷卻不當 Vc is higher or cooling too fast.	1.使用含有碳化鈮材質，增加熱抵抗 Choose grade with higher Tac content. 2.使用正角刀片，降低切削速度進給及切深 Use positive insert, slow down cutting speed and feed or depth of cut.
	脆裂 Chipping	刀片材質太脆硬 Insert grade is too brittle.	1.使用含有鈷量較高材質，增加韌性 Choose grade with higher cobalt content. 2.使用負角刀片增加切削速度 Use negative insert and increase cutting speed.
	過度磨耗 Excess Wear	刀片材質太軟或加工速度太快 Insert grade is too soft or speed too high.	1.使用較硬或耐磨材質 Insert grade select hardness is higher or wear resistance is higher. 2.降低切削速率及進給 Decrease cutting speed and feed.
	凹陷 Notching	加工材料產生加工硬化而高度磨耗所造成 Cut material hardened wears the insert.	1.增加刀片切削邊緣角 Increase cutting rake angle. 2.降低切削速率及進給 Decrease the cutting speed and feed.
	積屑 Built-up Edge	加工切削速率太慢造成積屑 Cutting speed too slow causes built-up edge.	1.提高切削速率 Increase cutting speed. 2.使用較低摩擦力之鍍層如TIN Choose coating with lower friction such as TIN.
	變形 Deformation	切削速率太快或進給量太大 Cutting speed too high or feed too larg.	1.使用更耐熱材質或較硬材質 Use insert grade with higher heat resistance or choose grade with higher hardness. 2.降低切削速率及進給 Decrease cutting speed and feed.
	熱裂 Cracking	切削產生高熱屑片黏在刀片上 Cutting case too high temp chip welded on insert.	1.使用較硬材質刀片 Choose grade with higher hardness. 2.降低切削速率及進給 Decrease cutting speed and feed.

■ 技術資料 Technical Information

(一) 切削速度 Cutting Speed (Vc)

$$V_c = \frac{\pi \times D \times S}{1000} \text{ m/min}$$

$$S = \frac{1000 \times V_c}{\pi \times D} \text{ r.p.m.}$$

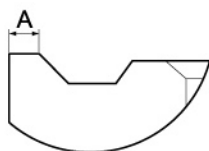
Vc = 切削速度 (Cutting speed) m/min

D = 被加工材料直徑 (Cut material outer dimension) mm

S = 主軸轉速 (Spindle speed) r.p.m

(二) 加工量進給與斷屑槽關係-每轉進給須大於斷屑槽 Land 寬(>A)

The relationship between feed and chipbreak-Feed per turn larger than that of the land of the chip breaker



Land A mm	Feed fn mm/rev
0.0635	0.08~0.13
0.0762	0.10~0.25
0.2547	0.27~0.40
0.1524	0.17~0.25
0.2667	0.28~0.40

(三) 切削量移除率 Metal removal (cm³/min)

$$\theta z = V_c \times f_n \times a_p$$

fn = 每轉進給 (Feed per turning) mm/rev

ap = 切深 (Depth of cut) mm

(四) 消耗動力 Power demand (KW)

$$P_{kw} = \frac{K_s \times A_e \times A_p \times F}{60 \times 1000 \times \eta}$$

Ks = 切削抵抗 (Specific cutting force) kg/m²

Ae = 切寬 (Width of cut) mm

Ap = 切深 (Depth of cut) mm

F = 工作台進給 (Table feed) mm/min

η = 機台效率 (Efficiency of machine=0.7~0.8)

品 項	Value of Ks
低碳鋼 Low carbon steel	190
中碳鋼 Carbon steel	210
高碳鋼 High carbon steel	240
低合金鋼 Low alloyed steel	190
高合金鋼 High alloyed steel	245
鑄鐵 Cast iron	93
球墨鑄鐵 Ductile iron	120
銅合金 Copper alloy	70

Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

Turning Insert
車刀系列

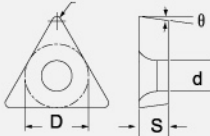
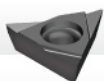
Drilling Insert
鑽刀系列

Customized products
特殊系列

Blank
素材

全鎢鋼防震刀桿 Solid carbide shank



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension					外型 Type
			D	S	r	d	θ	
	GW1320-1	TCGT110204-FY	16.35	2.38	0.4	2.80	7°	
	GW1368-1-2	TPGT080202-FY	4.76	2.38	0.2	2.34	11°	
	GW1368-1-4	TPGT080204-FY	4.76	2.38	0.4	2.34	11°	
	GW1368-1-8	TPGT080208-FY	4.76	2.38	0.8	2.34	11°	
	GW1649-1-2	TPGT090202-FY	5.56	2.38	0.2	2.65	11°	
	GW1649-1-4	TPGT090204-FY	5.56	2.38	0.4	2.65	11°	
	GW1649-1-8	TPGT090208-FY	5.56	2.38	0.8	2.65	11°	
	GW1028	TPGT09T204-FY	5.56	2.78	0.4	2.80	11°	
	GW1608	TPMW110302-FY	6.35	3.18	0.2	3.40	11°	
	GW1612-1-2	TPGT110302-FY	6.35	3.18	0.2	3.40	11°	
	GW1612-1-4	TPGT110304-FY	6.35	3.18	0.4	3.40	11°	
	GW1612-1-8	TPGT110308-FY	6.35	3.18	0.8	3.40	11°	

■ 內徑加工面粗度 Surface Quality

(一) 刀刃R角與進刀量 Relationship between insert radius and feed to the surface quality

刀刃R角 Insert radius	面粗度 Ra			
	0.4	1.6	3.2	6.3
	進給 mm / 轉			
0.2R	0.05	0.08	0.13	
0.4R	0.07	0.11	0.17	0.22

(二) 刀柄材質防震效果 Surface quality affected by material of tooling shank

$\frac{L}{D} = 4$ 以下 鋼柄 Steel Bar

L = 加工深度 Depth of cut

D = 加工孔徑 Diameter of cutting hole

$\frac{L}{D} = 5\sim7$ 全鎢鋼柄 Solid carbide Bar

■ 加工條件 Machining Condition Guide

加工材質 Machined Material	加工形態 Machining Condition	$\frac{L}{D} = 3$ 以下		$\frac{L}{D} = 3\sim4$		$\frac{L}{D} = 4\sim5$		$\frac{L}{D} = 6\sim7$	
		vc m/min	fs mm/rev	vc m/min	fs mm/rev	vc m/min	fs mm/rev	vc m/min	fs mm/rev
碳鋼 Carbon steel	輕切 Finish	90~150	0.05~0.15	80~140	0.05~0.15	80~120	0.05~0.15	100~180	0.05~0.15
合金鋼 Alloyed steel	中切 Semi-finish	60~120	0.15~0.30	50~110	0.15~0.25	40~90	0.15~0.25	80~130	0.15~0.30
不鏽鋼 Stainless steel	輕切 Finish	100~180	0.05~0.15	100~180	0.05~0.15	80~160	0.05~0.15	100~180	0.05~0.15
	中切 Semi-finish	50~90	0.15~0.25	40~80	0.15~0.25	40~80	0.15~0.25	70~130	0.15~0.25
鋁合金 Aluminum alloy	輕切 Finish	200~400	0.05~0.15	200~400	0.05~0.15	200~300	0.05~0.15	200~400	0.05~0.15
	中切 Semi-finish	150~250	0.05~0.15	150~250	0.05~0.15	150~250	0.05~0.15	150~250	0.05~0.15
鑄鐵 Cast iron	輕切 Finish	80~140	0.05~0.15	80~130	0.05~0.15	80~120	0.05~0.15	80~150	0.05~0.15
	中切 Semi-finish	60~100	0.1~0.4	60~100	0.1~0.4	50~90	0.1~0.3	60~110	0.1~0.3

Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

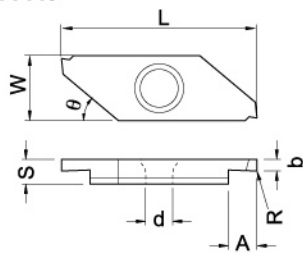
Turning Insert
車刀系列

Drilling Insert
鑽刀系列

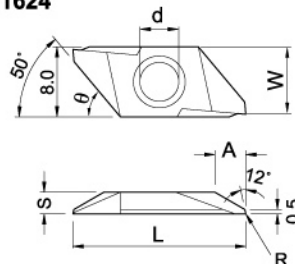
Customized products
特殊系列

Blank
素材

GW1449



GW1624



MKGR切槽 (FT)、切斷刀片 (PT)、後掃刀片 (BT)、牙刀 (TH)

MKGR Type Inserts for Grooving (FT) & Parting (PT)

& Turning (BT) & Threading (TH)

GW1449 $\theta = 40^\circ$

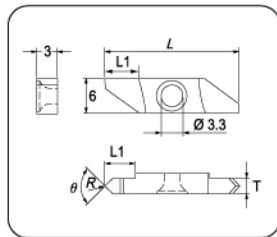
GW1624 $\theta = 50^\circ$



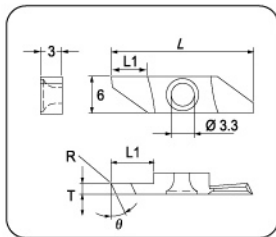
訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension						
		L	W	S	d	A	b	R
GW1449-PT100	GW1449-PT100	25.0	8.0	3.18	4.8	12.7	2.7	0.10
GW1449-PT150	GW1449-PT150	25.0	8.0	3.18	4.8	3.7	3.7	0.10
GW1449-PT200	GW1449-PT200	25.0	8.0	3.18	4.8	3.7	3.7	0.10
GW1624-PT050	GW1624-PT050	20.0	8.0	2.50	4.5	1.3	1.3	0.15
GW1624-PT075	GW1624-PT075	20.0	8.0	2.50	4.5	1.8	1.8	0.05
GW1624-PT100	GW1624-PT100	20.0	8.0	2.50	4.5	2.5	2.5	0.05
GW1624-PT150	GW1624-PT150	20.0	8.0	2.50	4.5	3.5	3.5	0.05
GW1624-PT200	GW1624-PT200	20.0	8.0	2.50	4.5	5.0	5.0	0.05
GW1624-FT100	GW1624-FT100	20.0	8.0	2.50	4.5	2.5	2.5	0.05
GW1624-FT150	GW1624-FT150	20.0	8.0	2.50	4.5	3.5	3.5	0.05
GW1624-FT200	GW1624-FT200	20.0	8.0	2.50	4.5	5.0	5.0	0.05
GW1624-BT2802	GW1624-BT2802	20.0	8.0	2.50	4.5	7.5	7.5	0.10
GW1624-BT3502	GW1624-BT3502	20.0	8.0	2.50	4.5	7.5	7.5	0.10
GW1624-TH60.20.02	GW1624-TH60.20.02	20.0	8.0	2.50	4.5	6.0	6.0	0.20
GW1624-TH55.20.02	GW1624-TH55.20.02	20.0	8.0	2.50	4.5	6.0	6.0	0.20

I 小型單孔螺絲固定刀片 - Small Size Single Screw Lock Type

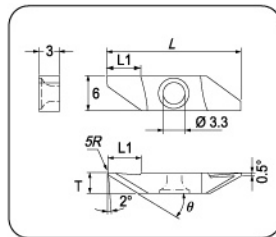
TG 右/左向牙刀片
Left / Right handed threading



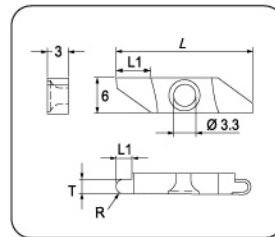
PG 右/左向切斷刀片
Left / Right handed parting



BT 右/左向後掃刀片
Left / Right back turning



FG 右/左向插掃刀片
Left / Right grooving turning

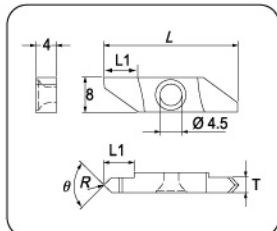


訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
		L	L1	T	θ	R
GW1668-55°THED-R	TG2863-5501-R	28.0	5.0	2.0	55°	0.1
GW1668-60°THED-R	TG2863-6001-R	28.0	5.0	2.0	60°	0.1
GW1661-55°THED-L	TG2863-5501-L	28.0	5.0	2.0	55°	0.1
GW1661-60°THED-L	TG2863-6001-L	28.0	5.0	2.0	60°	0.1
GW1668-PG-100R	PG2863-100R	28.0	4.0	1.0	15°	0.1
GW1668-PG-150R	PG2863-150R	28.0	5.0	1.5	15°	0.1
GW1668-PG-200R	PG2863-200R	28.0	5.0	2.0	15°	0.1
GW1661-PG-100L	PG2863-100L	28.0	4.0	1.0	15°	0.1
GW1661-PG-150L	PG2863-150L	28.0	5.0	1.5	15°	0.1
GW1661-PG-200L	PG2863-200L	28.0	5.0	2.0	15°	0.1
GW1668-BT-35°-R	BT2863-35°-R	28.0	3.0	3.0	35°	0.05
GW1661-BT-35°-L	BT2863-35°-L	28.0	3.0	3.0	35°	0.1
GW1668-BT-20°-R	BT2863-20°-R	28.0	3.0	3.0	20°	0.1
GW1661-BT-20°-L	BT2863-20°-L	28.0	3.0	3.0	20°	0.1
GW1668-FG-100R	FG2863-100R	28.0	1.7	1.0	-	0.1
GW1668-FG-150R	FG2863-150R	28.0	3.0	1.5	-	0.2
GW1668-FG-200R	FG2863-200R	28.0	4.0	2.0	-	0.2
GW1661-FG-100L	FG2863-100L	28.0	1.7	1.0	-	0.1
GW1661-FG-150L	FG2863-150L	28.0	3.0	1.5	-	0.2
GW1661-FG-200L	FG2863-200L	28.0	4.0	2.0	-	0.2

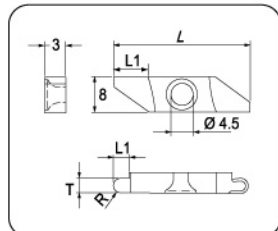
Materials
材料與材質Coating
鍍層Milling Insert
銑刀系列Turning Insert
車刀系列Drilling Insert
鑽刀系列Customized products
特殊系列Blank
素材

2 單孔螺絲固定刀片 - Single Screw Lock Type

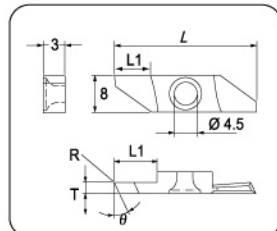
TG 右向牙刀片
Right handed threading



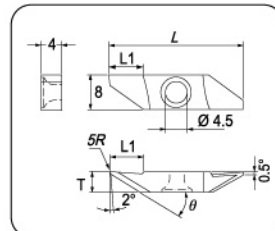
RG 右向圓槽刀片
Right radius grooving



PG 右向切斷刀片
Right parting

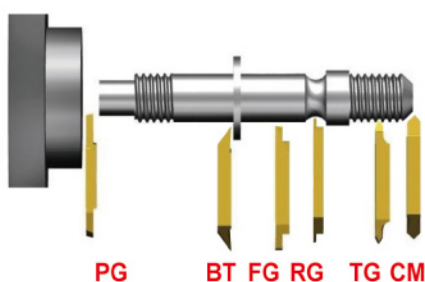


BT 右向後掃刀片
Right back turning



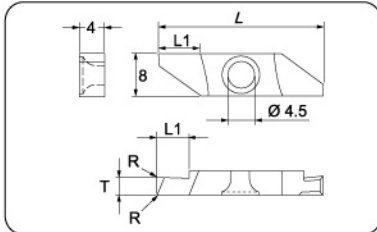
刀片槽型 Blade shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			L	L1	T	θ	R
	GW1359-55°THED-R	TG35.843.5501-R	35.0	6.0	2.0	55°	0.1
	GW1359-60°THED-R	TG35.843.6001-R	35.0	6.0	2.0	60°	0.1
	GW1359-RG-100R	RG35844-050R	35.0	2.2	1.0	-	0.5
	GW1359-RG-200R	RG35844-100R	35.0	3.7	2.0	-	1.0
	GW1359-RG-300R	RG35844-150R	35.0	4.2	3.0	-	1.5
	GW1359-RG-400R	RG35844-200R	35.0	4.0	4.0	-	2.0
	GW1359-PG-100R	PG35843-100R	35.0	6.5	1.0	15°	0.05
	GW1359-PG-150R	PG35843-150R	35.0	8.5	1.5	15°	0.1
	GW1359-PG-200R	PG35843-200R	35.0	8.5	2.0	15°	0.1
	GW1359-PG-250R	PG35843-250R	35.0	8.5	2.5	15°	0.1
	GW1359-PG-300R	PG35843-300R	35.0	8.5	3.0	15°	0.1
	GW1359-BT35-310R	BT35843-010-35°-R	35.0	3.5	3.0	35°	0.1
	GW1359-BT35-410R	BT35844-010-35°-R	35.0	5.0	4.0	35°	0.1
	GW1359-BT35-420R	BT35844-020-35°-R	35.0	5.0	4.0	35°	0.2
	GW1359-BT20-210R	BT35842-010-20°-R	35.0	3.5	2.0	20°	0.1
	GW1359-BT20-310R	BT35843-010-20°-R	35.0	6.0	3.0	20°	0.1
	GW1359-BT20-320R	BT35843-020-20°-R	35.0	6.0	3.0	20°	0.2

刀片加工示意圖 Inserts machining figure

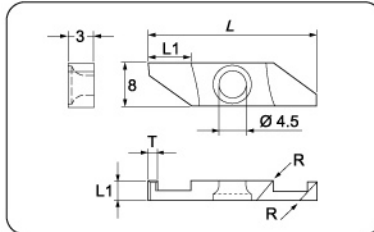


2 單孔螺絲固定刀片 - Single Screw Lock Type

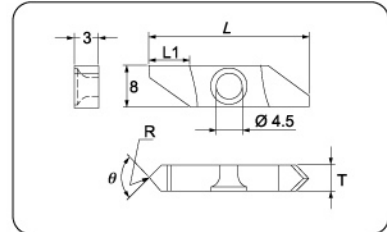
FG 右向插掃刀片
Right grooving turning



FT 端面切槽刀片
Face grooving



CM 倒角
Chamfer



刀片槽型 Blade shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			L	L1	T	θ	R
	GW1359-FG-100R	FG35844-100R	35.0	2.5	1.0	-	0.1
	GW1359-FG-150R	FG35844-150R	35.0	3.0	1.5	-	0.1
	GW1359-FG-200R	FG35844-200R	35.0	4.0	2.0	-	0.1
	GW1359-FG-250R	FG35844-250R	35.0	6.0	2.5	-	0.1
	GW1359-FG-300R	FG35844-300R	35.0	8.0	3.0	-	0.1
	GW1359-FG-350R	FG35844-350R	35.0	8.0	3.5	-	0.1
	GW1359-FG-400R	FG35844-400R	35.0	8.0	4.0	-	0.1
	GW1359-FT-050R	FT35844-050R	35.0	6.0	0.5	s=1.5	0.1
	GW1359-FT-100R	FT35844-100R	35.0	6.0	1.0	s=1.8	0.1
	GW1359-FT-150R	FT35844-150R	35.0	6.0	1.5	s=1.8	0.1
	GW1359-90°-CM	CM35844-90°	35.0	6.0	4.0	90°	0.2

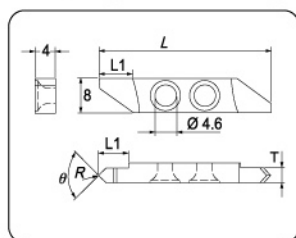
加工條件 Machining Condition Guide

加工材質 Machined Material	車削加工 Turning			切斷加工 Parting		
	切削速率 VC m/min	切 深 AP /min	進 給 fs mm /rev	切削速率 VC m/min	切 深 AP /min	進 給 fs mm /rev
快削鋼 Free cutting steel	100~200	0.05~4.0	0.01~0.25	75~150	0.05~3.0	0.01~0.15
低碳鋼 Low carbon steel	70~160	0.05~4.0	0.01~0.25	60~120	0.05~3.0	0.01~0.12
中碳鋼 Carbon steel	55~120	0.05~4.0	0.01~0.20	50~100	0.05~3.0	0.01~0.00
合金鋼 Alloyed steel	45~100	0.05~4.0	0.01~0.15	35~80	0.05~3.0	0.01~0.08
不鏽鋼 Stainless steel	50~120	0.05~4.0	0.01~0.15	50~100	0.05~3.0	0.01~0.08
鋁合金 Aluminum alloy	200~1000	0.05~4.0	0.01~0.20	150~400	0.5~3.0	0.01~0.10
銅合金 Copper alloy	90~500	0.05~4.0	0.01~0.30	90~300	0.5~3.0	0.01~0.20
鈦合金 Titanium alloy	25~70	0.05~4.0	0.01~0.08	25~50	0.5~3.0	0.01~0.06

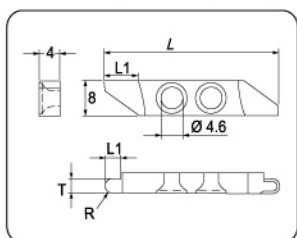
Materials
材料與材質Coating
鍍層Milling Insert
銑刀系列Turning Insert
車刀系列Drilling Insert
鑽刀系列Customized products
特殊系列Blank
素材

3 雙孔螺絲固定刀片 - Double Screw Lock Type

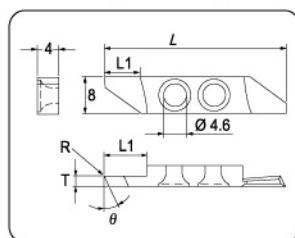
TG 右/左向牙刀片
Left / Right handed threading



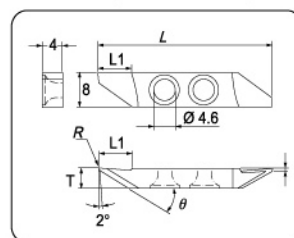
RG 右/左向圓槽刀片
Left / Right radius grooving



PG 右/左向切斷刀片
Left / Right handed parting



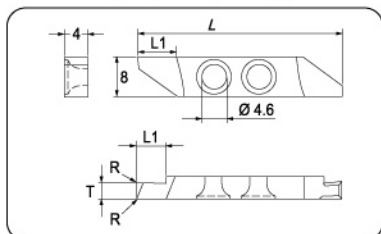
BT 右/左向後掃刀片
Left / Right back turning



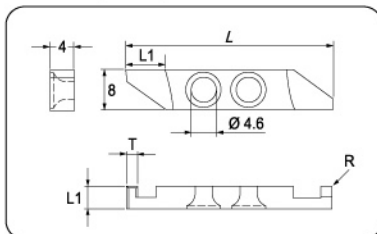
刀片槽型 Blade shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			L	L1	T	θ	R
	GW1335P-55°THED-R	TG37.844.5501-R	37.5	6.0	3.0	55°	0.1
	GW1335P-60°THED-R	TG37.844.6001-R	37.5	6.0	3.0	60°	0.1
	GW1335P-55°THED-L	TG37.844.5501-L	37.5	6.0	3.0	55°	0.1
	GW1335P-60°THED-L	TG37.844.6001-L	37.5	6.0	3.0	60°	0.1
	GW1335P-RG-100R	RG37844-050R	37.5	2.2	1.0	-	0.5
	GW1335P-RG-200R	RG37844-100R	37.5	3.7	2.0	-	1.0
	GW1335P-RG-300R	RG37844-150R	37.5	4.2	3.0	-	1.5
	GW1335P-RG-400R	RG37844-200R	37.5	5.0	4.0	-	2.0
	GW1335P-RG-100L	RG37844-050L	37.5	2.2	1.0	-	0.5
	GW1335P-RG-200L	RG37844-100L	37.5	3.7	2.0	-	1.0
	GW1335P-RG-300L	RG37844-150L	37.5	4.2	3.0	-	1.5
	GW1335P-RG-400L	RG37844-200L	37.5	5.0	4.0	-	2.0
	GW1335P-PG-100R	PG37844-100R	37.5	6.5	1.0	20°	0.05
	GW1335P-PG-150R	PG37844-150R	37.5	8.5	1.5	20°	0.1
	GW1335P-PG-200R	PG37844-200R	37.5	8.5	2.0	20°	0.1
	GW1335P-PG-250R	PG37844-250R	37.5	8.5	2.5	20°	0.1
	GW1335P-PG-300R	PG37844-300R	37.5	8.5	3.0	20°	0.1
	GW1335P-PG-100L	PG37844-100L	37.5	6.5	1.0	20°	0.05
	GW1335P-PG-150L	PG37844-150L	37.5	8.5	1.5	20°	0.1
	GW1335P-PG-200L	PG37844-200L	37.5	8.5	2.0	20°	0.1
	GW1335P-PG-250L	PG37844-250L	37.5	8.5	2.5	20°	0.1
	GW1335P-PG-300L	PG37844-300L	37.5	8.5	3.0	20°	0.1
	GW1335P-BT35-310R	BT37843-010-35°R	37.5	3.5	3.0	35°	0.1
	GW1335P-BT35-410R	BT37844-010-35°R	37.5	5.0	4.0	35°	0.1
	GW1335P-BT35-420R	BT37844-020-35°R	37.5	5.0	4.0	35°	0.2
	GW1335P-BT20-210R	BT37842-010-20°R	37.5	3.5	2.0	20°	0.1
	GW1335P-BT20-310R	BT37843-010-20°R	37.5	6.0	3.0	20°	0.1
	GW1335P-BT20-320R	BT37843-020-20°R	37.5	6.0	3.0	20°	0.2
	GW1335P-BT35-310L	BT37843-010-35°L	37.5	3.5	3.0	35°	0.1
	GW1335P-BT35-410L	BT37844-010-35°L	37.5	5.0	4.0	35°	0.1
	GW1335P-BT35-420L	BT37844-020-35°L	37.5	5.0	4.0	35°	0.2
	GW1335P-BT20-210L	BT37842-010-20°L	37.5	3.5	2.0	20°	0.1
	GW1335P-BT20-310L	BT37843-010-20°L	37.5	6.0	3.0	20°	0.1
	GW1335P-BT20-320L	BT37843-020-20°L	37.5	6.0	3.0	20°	0.2

3 雙孔螺絲固定刀片 - Double Screw Lock Type

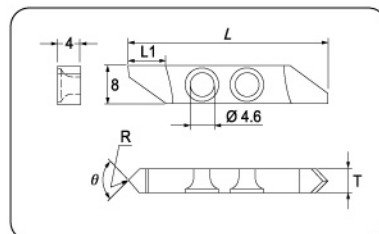
FG 右/左向插掃刀片
Left / Right grooving turning



FT 端面切槽刀片
Face grooving

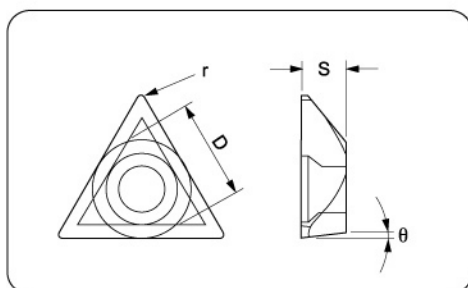


CM 倒角
Chamfer



刀片槽型 Blade shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			L	L1	T	θ	R
	GW1335P-FG-100R	FG37844-100R	37.5	2.5	1.0	-	0.1
	GW1335P-FG-150R	FG37844-150R	37.5	3.0	1.5	-	0.1
	GW1335P-FG-200R	FG37844-200R	37.5	4.0	2.0	-	0.1
	GW1335P-FG-250R	FG37844-250R	37.5	6.0	2.5	-	0.1
	GW1335P-FG-300R	FG37844-300R	37.5	8.0	3.0	-	0.1
	GW1335P-FG-350R	FG37844-350R	37.5	8.0	3.5	-	0.1
	GW1335P-FG-400R	FG37844-400R	37.5	8.0	4.0	-	0.1
	GW1335P-FG-100L	FG37844-100L	37.5	2.5	1.0	-	0.1
	GW1335P-FG-150L	FG37844-150L	37.5	3.0	1.5	-	0.1
	GW1335P-FG-200L	FG37844-200L	37.5	4.0	2.0	-	0.1
	GW1335P-FG-250L	FG37844-250L	37.5	6.0	2.5	-	0.1
	GW1335P-FG-300L	FG37844-300L	37.5	8.0	3.0	-	0.1
	GW1335P-FT-050R	FT37844-050R	37.5	6.0	0.5	S=1.5	0.1
	GW1335P-FT-100R	FT37844-100R	37.5	6.0	1.0	S=1.8	0.1
	GW1335P-FT-150R	FT37844-150R	37.5	6.0	1.5	S=1.8	0.1
	GW1335P-90°-CM	CM37844-90°	37.5	6.0	4.0	90°	0.2
	GW1335P-MG-085R	MG37844-085R	37.5	2.0	0.85	-	0.05
	GW1335P-MG-100R	MG37844-100R	37.5	2.5	1.00	-	0.1
	GW1335P-MG-125R	MG37844-125R	37.5	3.0	1.25	-	0.1
	GW1335P-MG-150R	MG37844-150R	37.5	3.7	1.50	-	0.1
	GW1335P-MG-175R	MG37844-175R	37.5	4.0	1.75	-	0.1
	GW1335P-MG-200R	MG37844-200R	37.5	5.0	2.00	-	0.1
	GW1335P-MG-250R	MG37844-250R	37.5	6.0	2.50	-	0.1
	GW1335P-MG-300R	MG37844-300R	37.5	8.0	3.00	-	0.1
	GW1335P-MG-350R	MG37844-350R	37.5	8.0	4.00	-	0.1
	GW1335P-MG-400R	MG37844-400R	37.5	9.0	4.50	-	0.1
	GW1335P-MG-450R	MG37844-450R	37.5	9.0	4.50	-	0.1
	GW1335P-MG-500R	MG37844-500R	37.5	9.0	5.00	-	0.1

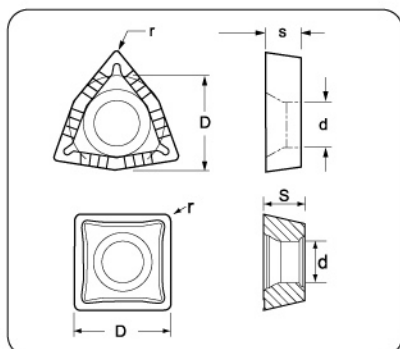
Materials
材料與材質Coating
鍍層Milling Insert
銑刀系列Turning Insert
車刀系列Drilling Insert
鑽刀系列Customized products
特殊系列Blank
素材



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension				
			D	S	d	r	θ
	GW1439N	TCEX16T308	9.52	3.97	4.4	0.8	7°
	GW1489A 0.2R	TPEX13T302	7.94	3.97	3.7	0.2	11°
	GW1489A 0.4R	TPEX13T304	7.94	3.97	3.7	0.4	11°

■ 特點說明 Features:

- 適用於多種形狀上的倒角，如圓孔、錐孔、溝槽、外邊。
 - 亦可做雕刻、定位的加工作業，
 - 適合多數材料的應用。
- Suit for most kinds of shape in chamfer process, ex: central hole, taper hole, grooving , outer side.
 - Also could do the engraving, positioning mark work.
 - Suit for most kinds of material machining application.



Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

Turning Insert
車刀系列

Drilling Insert
鑽刀系列

Customized products
特殊系列

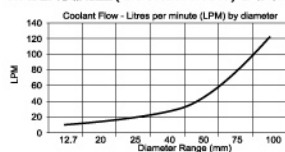
Blank
素材

刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension			
			D	d	s	r
	GW1130	WCMT-0302	5.56	2.78	2.38	0.80
	GW1129	WCMT-0402	6.36	2.97	2.38	0.80
	GW1128	WCMT-0503	7.96	3.40	3.18	0.80
	GW1127-1	WCMT-06T3	9.52	3.80	3.97	0.80
	GW1126	WCMT-0804	12.70	4.40	4.76	1.20
	GW2505N	SPMT-050204	5.00	2.25	2.38	0.40
	GW2469N	SPMT-060204	6.00	2.58	2.38	0.40
	GW2464N	SPMT-07T308	7.94	2.85	3.97	0.80
	GW2468N	SPMT-09T308	9.78	4.05	3.97	0.80

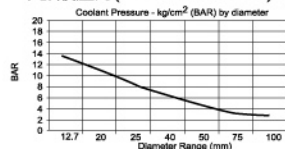
技術資料 Technical Information

加工條件 Machining Condition Guide

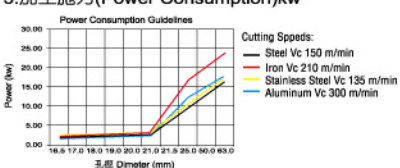
1. 冷卻液流量 (Coolant Flow) 公升/分 (l/min)



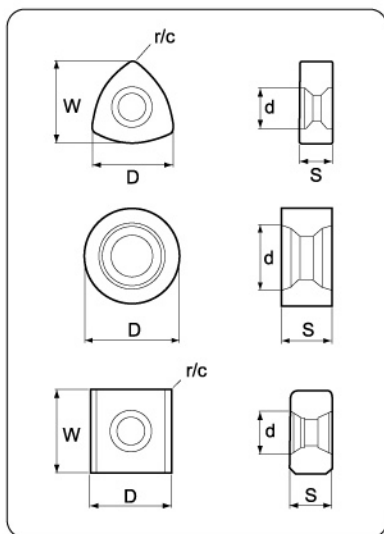
2. 冷卻液壓力 (Coolant Pressure) kg/cm²



3. 加工施力 (Power Consumption) kw



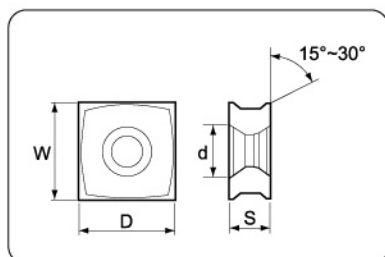
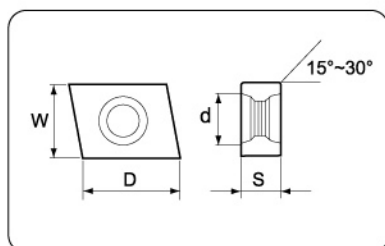
加工材質 Machined Material	刀片材質 鍍層 Insert material coating	切削速度 m/min sfs	進刀量 Feed mm/rev(轉)			
			Ø20以下	Ø20-Ø24	Ø20-Ø24	Ø45以上
低碳鋼 Low carbon steel	G12XF TIN	100~200	0.04~0.01	0.06~0.15	0.08~0.17	0.1~0.2
碳鋼 Carbon steel	G12XF TIN	100~200	0.04~0.01	0.06~0.15	0.08~0.17	0.1~0.2
合金鋼 Alloyed steel	G12XF TIN	100~200	0.04~0.01	0.06~0.12	0.08~0.17	0.1~0.2
不鏽鋼 Stainless steel	G12XF TIN	100~200	0.04~0.01	0.06~0.12	0.08~0.15	0.1~0.2
鋁合金 Aluminum alloy	G11C TIN	150~250	0.05~0.1	0.1~0.2	0.12~0.23	0.2~0.3
鑄鐵 Cast iron	G11C TIN	70~120	0.06~0.1	0.08~0.15	0.08~0.2	0.1~0.3



I 加工H型鋼、軌道用銑刀片 Inserts for milling H-Beam and rails

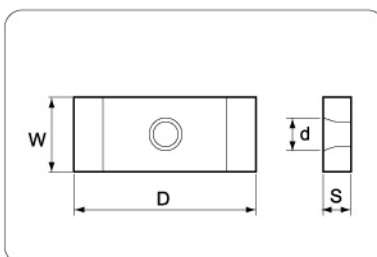


刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension					
			D	W	S	d	R-Face	r/c
	GW102	QNAC150608-ZC	16.3	-	6.35	5.4	-	0.8
	GW109	SNHW1306-ZC	13.5	13.5	6.35	5.4	-	0.3C
	GW1245	SNHW130710-10R	13.5	13.5	8.00	5.4	10.0	1.0
	GW654-7	RNHC1206	12.0	-	6.35	5.4	-	-
	GW275	RPKN2004-MO	20.0	-	4.76	-	-	$\theta 11^\circ$
	GW1444-1	SNGT1508-13R	15.88	15.88	7.93	5.3	13.0	-
	GW1444	SNGT1508-19R	15.88	15.88	7.93	5.3	19.0	-
	GW1465	SNGQ1206-MO-1C	12.7	12.7	6.35	4.4	-	1.0C
	GW1465-1	SNGQ1206-MO-10R	12.7	12.7	6.35	4.4	one side 10R	-
	GW1465-2	SNGQ120604-MO	12.7	12.7	6.35	4.4	-	0.40
	GW1465-3	SNGQ120620-MO	12.7	12.7	6.35	4.4	-	2.00
	GW1466	SNGQ1507-UG	15.88	15.88	7.94	5.3	 12	-



2 TSSN, TSCN, TSLN

- TSSN-ZC Type Precision Face Milling Inserts
- TSCN-ZC Type Precision Side Milling and Face Milling Inserts
- TSLN-ZC Type Precision Side Milling and Face Milling Inserts



刀片槽型 Insert shape	訂購編號 Ordering Code	刀片規格 Insert ISO Code	尺寸 Dimension			
			D	W	S	d
	GW1197-6ZC	SNHU1606-ZC	16.0	16.0	6.50	5.30
	GW1517-5ZC	SNHU1205-ZC	12.7	12.7	5.50	5.00
	GW1420	SNHU120610	12.7	12.7	6.50	4.60
	GW1422	LWHX2807R8	28.0	12.7	7.50	4.60
	GW1421	LNHX3006R2	30.0	12.7	6.50	4.60
	GW919-ZC	LNHU1606-ZC	16.0	12.0	6.40	5.80
	GW1481-ZC	LNHU1205-ZC	12.7	10.0	5.40	4.80
	GW1482-ZC	CNHU1205-ZC	10.5	10.0	5.40	4.80
	GW2456-ZC	CNHU1508-ZC	16.0	15.0	8.00	5.50
	GW2457-ZC	CNHU1206-ZC	12.7	12.7	6.35	4.40

Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

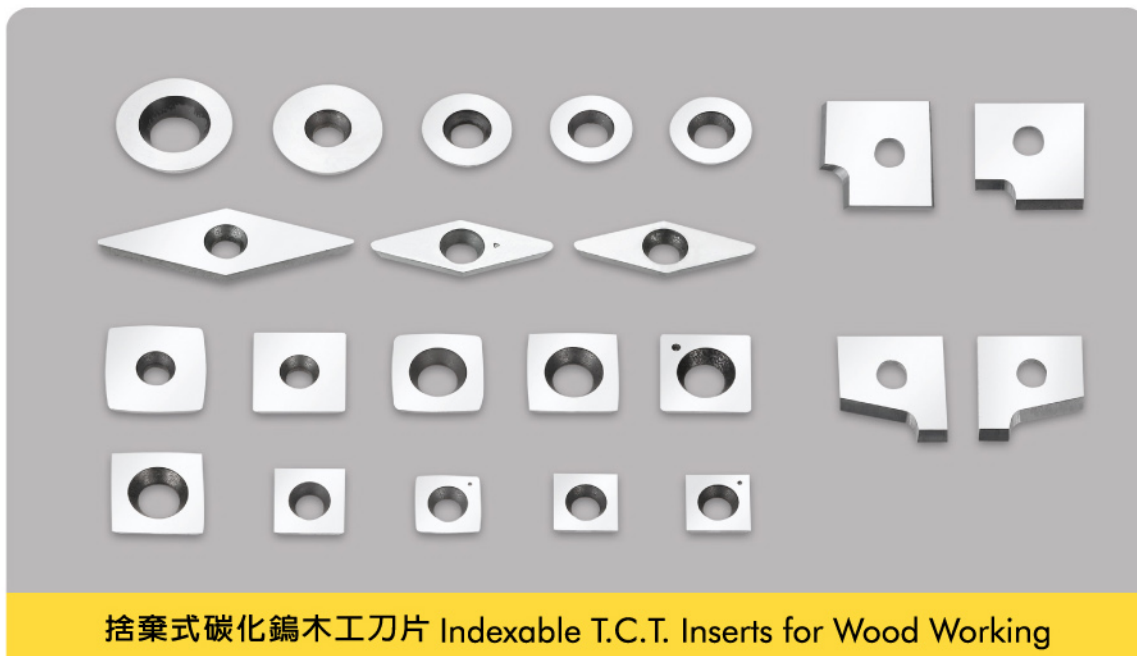
Turning Insert
車刀系列

Drilling Insert
鑽刀系列

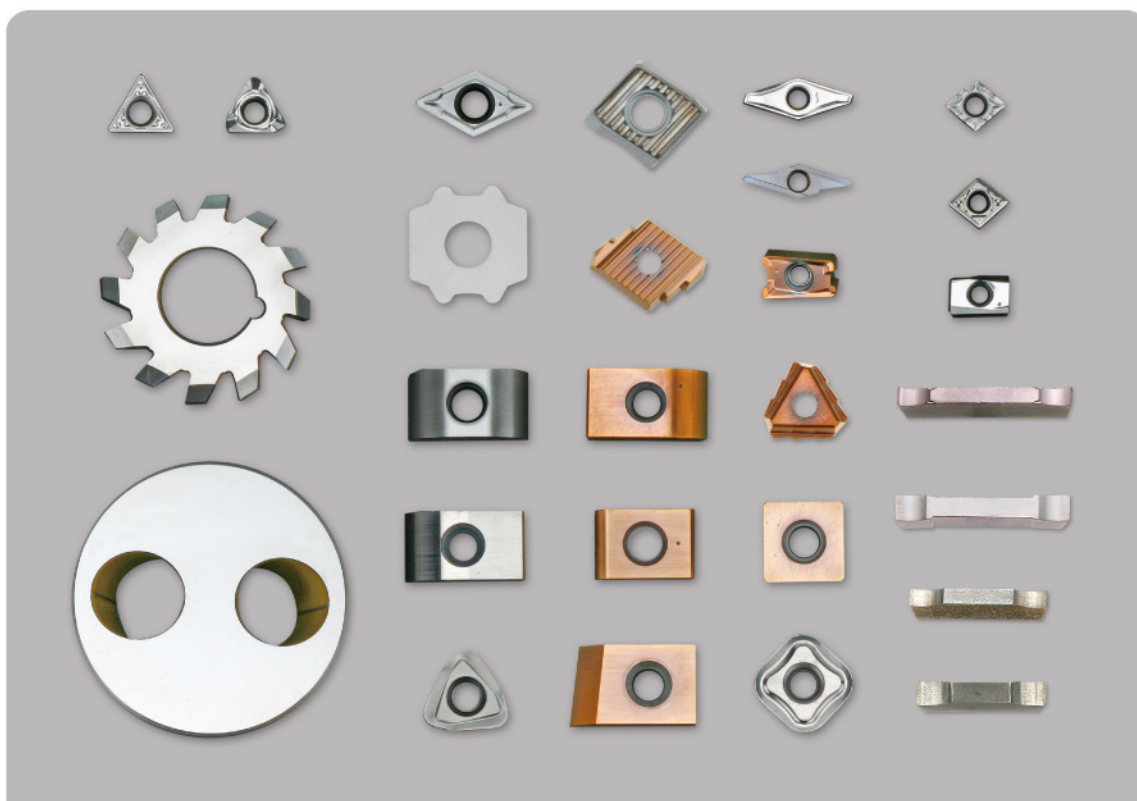
Customized products
特殊系列

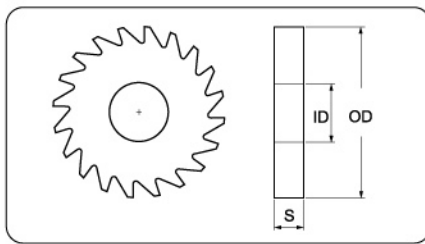
Blank
素材

- 木工平刀 Planner Cutter Inserts for Wood Working
- 木工車刀片 Turning Inserts for Wood Working
- 異形木工刀片 Shaper cutter Inserts for Wood Working



訂製規格刀片 Customized products





Materials
材料與材質

Coating
鍍層

Milling Insert
銑刀系列

Turning Insert
車刀系列

Drilling Insert
鑽刀系列

Customized products
特殊系列

Blank
素材

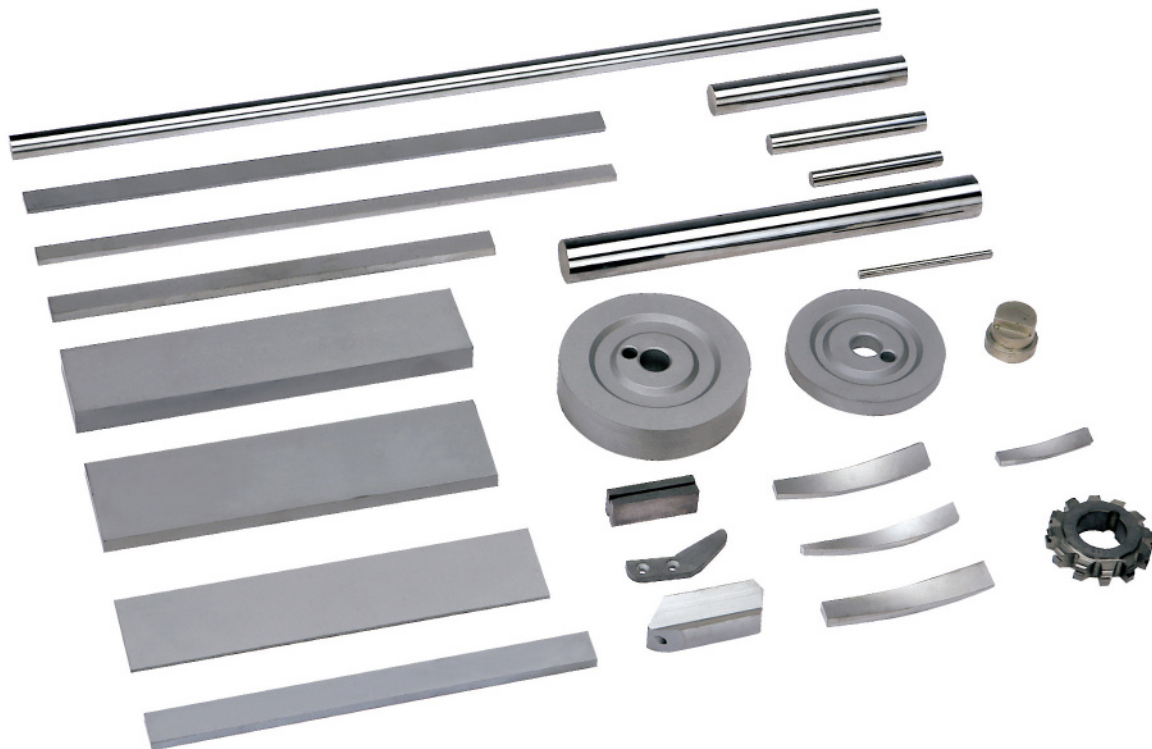
刀片槽型 Blade shape	尺寸 Dimension			
	OD	ID	S	T
TCT Ø125 x Ø1"x S x T	125	25.4	1.0~3.0	72T 56T
TCT Ø100 x Ø1"x S x T	100	25.4	0.8~4.0	72T 56T
TCT Ø90 x Ø1"x S x T	90	25.4	0.8~4.0	72T 56T
TCT Ø85 x Ø1"x S x T	85	25.4	0.8~4.0	72T 56T
TCT Ø80 x Ø1"x S x T	80	25.4	0.6~4.0	56T
TCT Ø75 x Ø1"x S x T	75	25.4	0.5~4.0	56T
TCT Ø70 x Ø1"x S x T	70	25.4	0.5~4.0	56T 40T
TCT Ø65 x Ø1"x S x T	65	25.4	0.5~4.0	56T 40T
TCT Ø60 x Ø1"x S x T	60	25.4	0.5~4.0	56T 40T
TCT Ø55 x Ø1"x S x T	55	25.4	0.5~4.0	40T
TCT Ø50 x Ø1"x S x T	50	25.4	0.5~4.0	40T
TCT Ø45 x Ø1"x S x T	45	25.4	0.5~4.0	40T
TCT Ø40 x Ø10 x S x T	40	10.0	0.5~4.0	40T
TCT Ø40 x Ø8 x S x T	40	8.0	0.5~4.0	40T
TCT Ø32 x Ø12 x S x T	32	12.0	0.5~4.0	30T
TCT Ø30 x Ø10 x S x T	30	10.0	0.5~4.0	30T
TCT Ø25 x Ø10 x S x T	25	10.0	0.5~4.0	30T

技術資料 Technical Information

齒深(mm) = 外徑 ÷ 齒數 x 0.045

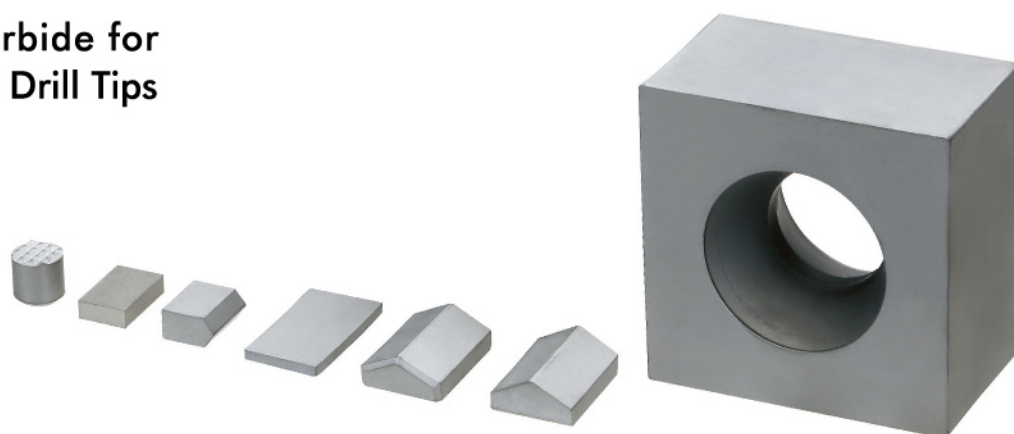
Depth of tooth(mm) = OD ÷ Numbers of tooth x 0.045

Tungsten Carbide for Tools & Cutters,
Such as Turning Tools,
Milling Cutters,
Reamers etc.



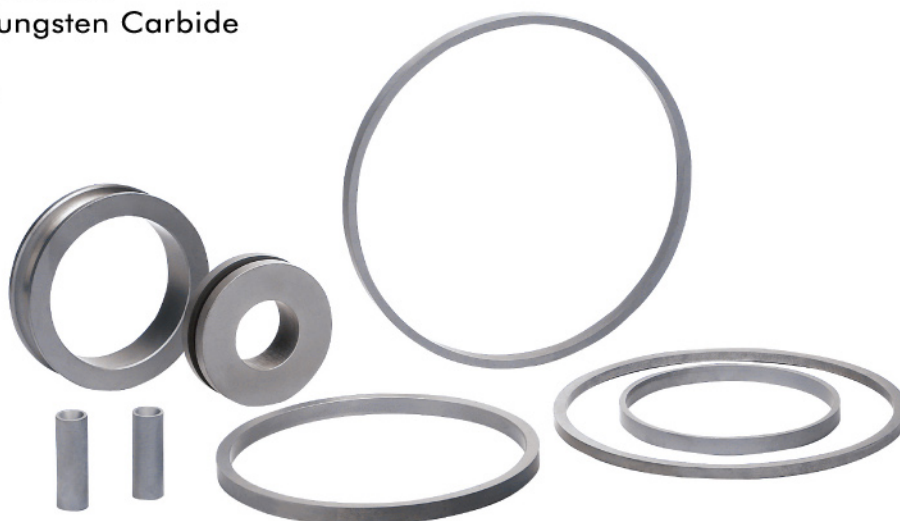
材質編號/ISO號 Material/ ISO No.	密度 Density g/ml	硬度 Hardness HRA	抗折力 AVE T.R.S kg/mm ²	適合加工材料 Applications	備註 Remarks
G10H / K05~K10	14.75	92.7	303	熱處理鋼材、碳鋼、合金鋼、不鏽鋼、鑄鐵 Hard steel, Carbon steel, Alloyed steel, Stainless steel, Cast iron.	超微粒 Sub-micron
G20H / K20~K30	14.5	91.4	289	碳鋼、合金鋼、不鏽鋼、鑄鐵、銅、鋁 Carbon steel, Alloyed steel, Stainless steel, Cast iron, Copper, Aluminum.	超微粒 Sub-micron
G10CF / K10	14.4	92	290	熱處理鋼材、碳鋼、合金鋼、不鏽鋼 Hardened steel, Carbon steel, Alloyed steel, Stainless steel.	車刀、銑刀 Turning tool, Milling cutter.
G20P / P20~P30	12.48	91.1	208	碳鋼、合金鋼、不鏽鋼 Carbon steel, Alloyed steel, Stainless steel.	車刀、銑刀 Turning tool, Milling cutter.
G15M / M15~M25	12.4	91.4	190	碳鋼、合金鋼、不鏽鋼 Carbon steel, Alloyed steel, Stainless steel.	車刀、銑刀、鉸刀 Turning tool, Milling cutter, Reamers.
G20KS / K30	14.8	89.5	200	木工刀、耐磨件 Wooden cutter, Abrasive part.	木工刀 Wooden cutter.
G10KS / K20	14.85	90.5	190	瓷磚、耐磨件 Tile, Abrasive part.	瓷磚刀 Tile cutter.
G10KTA / K10	14.85	92.5	180	鑄鐵、碳鋼、銅、鋁 Cast iron, Carbon steel, Copper, Aluminum.	車刀、銑刀 Turning tool, Milling cutter.
G6F / K05~K10	14.8	93.0	280	球墨鑄鐵、碳鋼、銅 Ductile iron, Carbon steel, Copper.	車刀、銑刀 Turning tool, Milling cutter.
G12XF / K10~K20	14.1	92.7	320	熱處理鋼材、合金鋼、鈦合金 Hardened steel, Alloyed steel, Titanium alloy.	端銑刀 End milling cutter.
G20M / M20	12.6	89.5	210	碳鋼、合金鋼 Carbon steel, Alloyed steel.	銑刀、鑽頭 Milling cutter, Drilling tool.
G11C / K30~K40	14.2	89.5	290	碳鋼、合金鋼、鑄鐵 Carbon steel, Alloyed steel, Cast iron.	車刀、鑽頭 Turning tool, Drilling tool.

Tungsten Carbide for Mining-earth Drill Tips



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G11C	14.5	88.6	250	地質鑽頭 Earth Drill Tips	
G13C	14.0	88.0	289	地質鑽頭 Earth Drill Tips	-
G16C	13.6	86.0	295	地質鑽頭 Earth Drill Tips	

- 耐腐蝕、耐酸用碳化鎢－環狀鎢鋼
- 鋸輪用碳化鎢－精軋鋸輪
- Corrosion Resistant Tungsten Carbide for Sealing
- Tungsten Carbide for Finish Rodmill Roller



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GSN2	14.5	90.0	210	化學幫浦、凡爾墊圈、噴嘴 Pump & Valve, Nozzle liners	鎳基碳化鎢 Ni-base carbide

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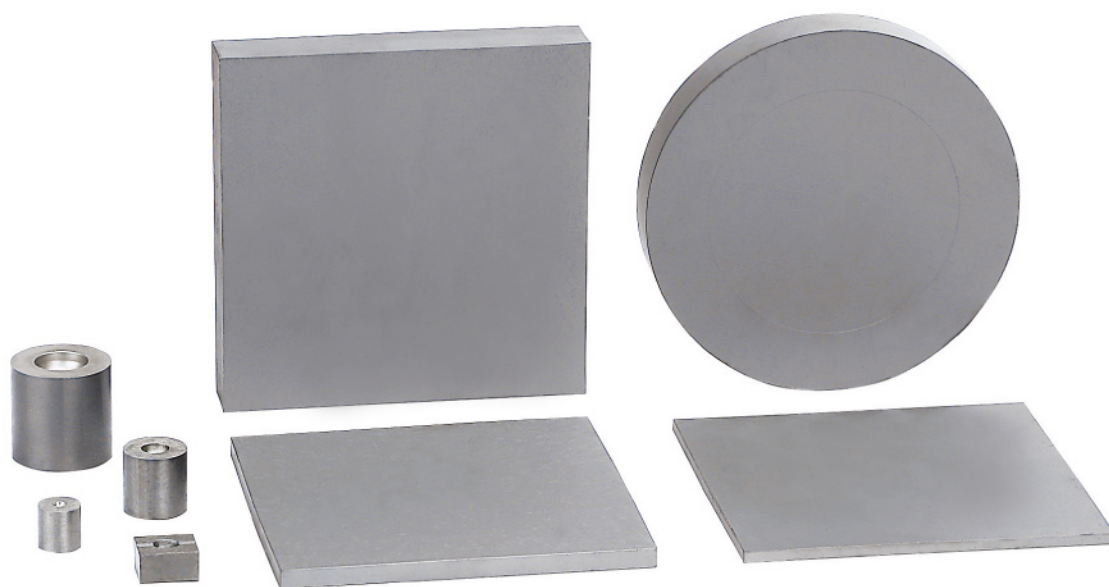
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- Tungsten Carbide for Header Nibs, Drawing Core Nibs, Lead-Frame Punch & Die



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G10K	14.9	92.4	175	抽線眼模、噴砂嘴 Drawing die nibs, Sandblasting nozzle	-
G13C	14.0	88.0	289	打頭模、衝模 Head nibs, Punch & die	-
G16C	13.9	86.0	295	打頭模、衝模 Head nibs, Punch & die	-
G20C	13.4	85.0	253	打頭模、衝模 Head nibs, Punch & die	-
G25C	13.1	84.0	264	打頭模、衝模 Head nibs, Punch & die	-
G50H	13.9	90.0	282	打頭模、衝模 Head nibs, Punch & die	超微粒 Submicron
G11C	14.2	89.5	290	抽線眼模 Drawing die nibs	-
G12XF	14.1	92.7	310	電子腳衝模、打頭模 Lead-frame punch & die, Head nibs	超細微粒 Ultra fine

- Tungsten Carbide for Tools & Cutters.
Such as Powder Metallurgy Impacting Mold, Wire Drawing Die, Press Mold, Hot Forging Mold, Cold Forging Mold, etc.



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G13C / C13	14.0	97.0	289	壓造模具、熱鍛模具、礦山工具 Press mold, Hot forging mold, Mining tool.	粉末冶金整形模 Powder metallurgy sizing mold
G20C / C14	13.4	86.0	253	熱鍛模具、冷鍛模具 Hot forging mold, Cold forging mold.	-
G25C / C17	13.1	83.0	264	熱鍛模具、冷鍛模具 Hot forging mold, Cold forging mold.	-

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Line QR Code



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