



厦门金鹭特种合金有限公司
XIAMEN GOLDEN EGRET SPECIAL ALLOY CO., LTD.

Фрезерный инструмент

--Indexable Milling Project Team

Update : Nov.2016

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1 Фрезерные сплавы



1.1

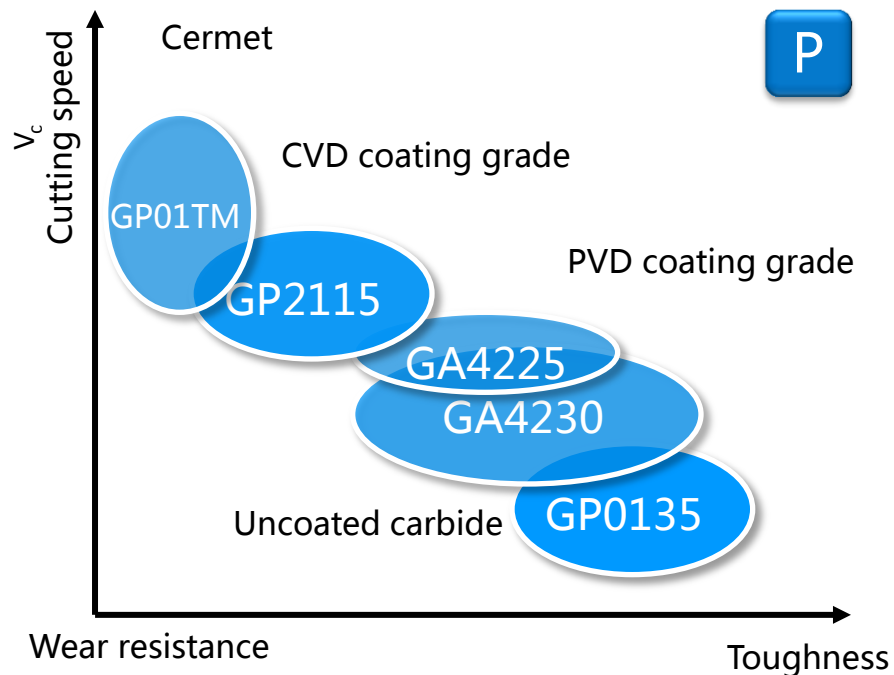
Фрезерные сплавы

ISO		P Сталь					K Чугун				M Нержавеющая сталь					S Жаропрочные сплавы					N Цветные сплавы				H Закаленные стали			
		P01	P10	P20	P30	P40	K01	K10	K20	K30	M01	M10	M20	M30	M40	S01	S10	S20	S30	S40	N01	N10	N20	N30	H01	H10	H20	H30
Покры- тие	CVD	GP2115					GK2115					GM2125						GS2140*										
												GM2140																
	PVD	GA4225					GK4125										GS4115								GH4125			
		GA4230																GS4130										
	Цементи- ро- ванный карбид			GP0135			GK0115														GA0115			GN9125				
Керамика		GP01TM																										

*黑色斜体为待开发牌号

1.2

Сплавы для обработки сталей



1

GP2115 (Новинка)

Для полу-чистовой обработки с покрытием CVD Al_2O_3 для обработки закаленных и жаропрочных сталей и сплавов.

Подходит для обычного и высокоскоростного фрезерования.

2

GA4225

С PVD покрытием на цементированном карбиде, подходит для обработки закаленных сталей.

3

GA4230 (Наиболее популярен)

Сплав для общего фрезерования сталей до 50 HRC, широко используется для чистовой, полу-чистовой и черновой обработок.

4

GP0135

Цементированный карбид без покрытия, широко используется для малой скорости резания при большой жесткости.

5

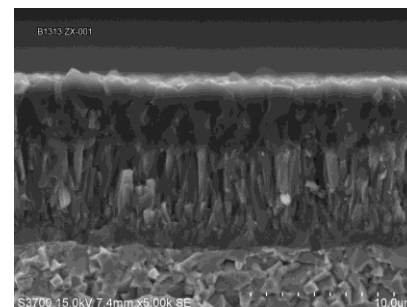
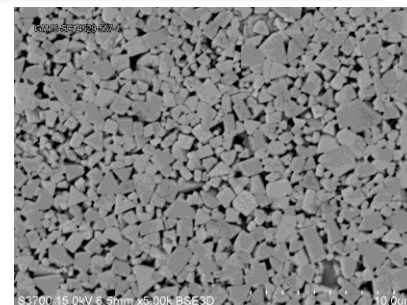
GP01TM

Керамическое зерно без покрытия, великолепная стойкость к пластической деформации и адгезионная стойкость, применим для чистовой и получистовой обработки без водяного охлаждения.

(1) Сплав для обработки стали GP2115-CVD

Material

- Totally new steel milling basal body with great toughness and red hardness.
- Medium thickness MT-Ti (C,N) +Al₂O₃ coating , excellent wear-resistance contribute to stable cutting.
- Exchangable Grade:
WKP25S/GC4220/GC4230/MP1500/KCPK30.etc
- The first choice for steel milling, also available for shoulder milling
- GP2115 have better wear-resistance compare with GA4230, especially in high speed milling
- Medium and high speed cutting for steel(Semi-finish and finish)
- Especially suitable for big workpiece milling with high wear-resistance demand
- 6 kind of insert have been pass the test of our customers
- We can provide the test sample according to customer' s demand.



Application

Product in stock

Insert Code	Stock
PRDMW1204M0T-BM-GP2115	501
PSEET13T3AGEN-PM-GP2115	110
PSNEU1206ANEN-GM-GP2115	198
PSNEU1206ANEN-GW-GP2115	94
PSNEU1206ANEN-GH-GP2115	57

Steel Milling GP2115-CVD Coating——German Report

HENGST KESSLER PRÄZISIONSWERKZEUGE		LEISTUNGSAfterWEIS				Machine tool Mazak VC SMART 530C	
		☐ DREHEN ☒ FRÄSEN ☐ BOHREN				☒ CNC ☐ Nein	
Kunde		Kunden-Nr.		Spindel Power KW		11KW	
Unterschrift / Kunde		Datum		Material		C-45	
Aussteller		Itd. Nr.		CMC-Code		01.2	
Werkstück		Projekt		Hardness		☒ HRC ☐ HR	
Zeichnungs-Nr.		Maschinen-Nr.		Kostenstelle		210	
Operation		Tool		Angebot (K)		Tensile Strength	
Roughing		MFB145-063R06A22-SN12		45°		700	
Cutting Condition		1		2		3	
Speed v_c (m / min)		260		180		260	
RPM n (U / min)		1313		910		1313	
Feed f (mm / min)		1970		1365		1970	
Number of teeth (z_n)		6		6		6	
Feed per tooth f_z (mm / tooth)		0.25		0.25		0.25	
Feed per Rev f_n (mm / rev)		1.5		1.5		1.5	
Depth of cut a_p / a_e (mm)		2.5 / 41		2.5 / 41		2.5 / 41	
Contact time (min)		4		5.7		4	
Insert		SNEU		SNEU		HNGJ0905AN	
Dimension		1206		1206		0905	
Geometry		ANEN-GM		ANEN-GM		ENLD	
Grade		GA4230		GA4230		KCPK30	
Manufacturer		US Tools		US Tools		US Tools	
Wear		VB 0,12 / 0,29		VB 0,10 / 0,35		VB 0,32	
Tool Life End		☐ Ja ☐ Nein		☒ Ja ☐ Nein		☒ Ja ☐ Nein	
Wear criteria		reifläche / Pocket wear		reifläche/Pocket wear		Freifläche	
Performance criteria		2		3		6	
Chip form		5		6		7	
Piece/ Number of cutting edge		2		3		6	
Tool life min / cutting edge		8min		17min		24min	
Pitch in %							
Surface Condition		☒ Machined ☐ Geschält ☐ Kaltfließgepreßt ☐ Gebrannt		☐ Schmiedehaut ☐ Leichte Gußhaut ☐ Schw. Gußhaut ☐		☒ Continuous ☐ Unterbrochen ☐	
Coolant		☒ dry ☐ Emulsion ☐ Air ☐ Oil		☒ Good ☐ Schlecht		☐ Maschine ☐ Werkzeug ☐ Aufspannung ☐ Werkstück	
Heat Treatment		☐ Geglüht ☐ Durchgehärtet ☐ Oberflächegehärtet		☒ None ☐ Sandeinschlüsse ☐ Ungleiche Härte		☐ Operation ☐ Schichten ☐ Vorschlichten ☒ Roughing ☐ Grobschuppen	
Material Failure		☒ None ☐ Sandeinschlüsse ☐ Ungleiche Härte		☐ Operation ☐ Schichten ☐ Vorschlichten ☒ Roughing ☐ Grobschuppen		☐ Stability ☐ Schlecht ☐ Aufspannung ☐ Werkstück	
Notes:		Wkz. 1: Tooldiameter 63mm Z6. Axial Runout 0,012mm. Spindel load at the beginning of the trial 67%, at tool life end 78%. After 8min tool life VB 0,12mm. Strong Pocket wear 0,34mm. Wkz. 2: Tooldiameter 63mm Z6. Axial Runout 0,013mm. Spindel load at the beginning of the trial 51%, at tool life end 67%. After 11,4min tool life VB 0,05mm. Strong Pocket wear 0,32mm . After 17min tool life VB 0,1mm. Very heavy Pocket wear . Wkz. 3: Tooldiameter 63mm Z6. Axial Runout 0,009mm. Spindel load at the beginning of the trial 56%, at tool life end 70%. After 16min tool life flank wear 0,15mm. No Pocket wear. After 24min tool life VB 0,32mm. Light Pocket wear. Wkz. 4: Tooldiameter 63mm Z6. Axial Runout 0,01mm. Spindel load at the beginning of the trial 59%, at tool life end 80%. After 16min tool life flank wear 0,15mm. No Pocket wear. After 24min tool life VB 0,37mm. Light Pocket wear. Wkz. 5: Tooldiameter 63mm Z6. Axial Runout 0,011mm. Spindel load at the beginning of the trial 67%, at tool life end 74%. After 24min tool life flank wear 0,09mm. Heavy Pocket wear 0,35mm. After 28min tool life VB 0,15mm. Heavy Pocket wear.					

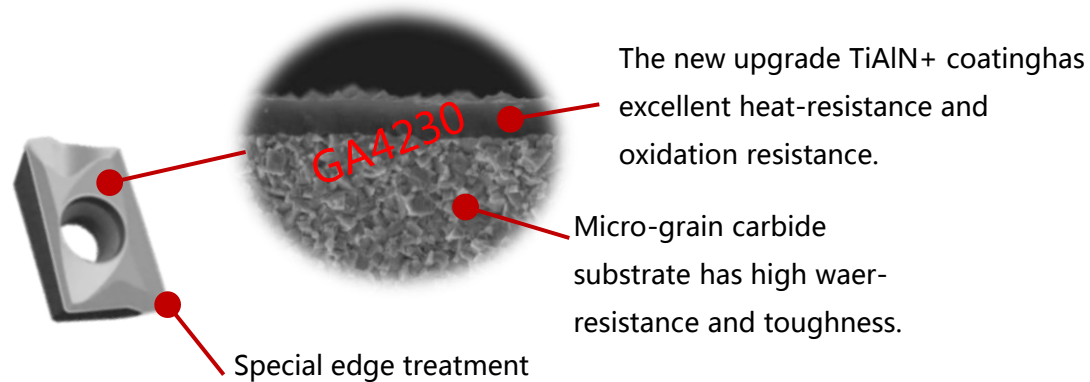


Application: High speed face milling, $V_c=260\text{m/min}$
 Result: GP2115 equal to SS GC4230, AK KCPK30; much better than GESAC GA4230

(2) Сплав для обработки сталей GA4230-PVD

Material

Generally milling grade ,the maximum hardness can achieve 50 HRC ,widely used for light,medium and heavy milling .The first choice for mold milling.



The difference with GA4225

- Basal body with difference process technology
GA4230 have better toughness than GA4225.
- Different Coating

GA4230 have the new upgrade TiAlN coating with better heat-resistance and oxidation resistance , GA4225 with AlCrN coating

- Upgraded edge treatment

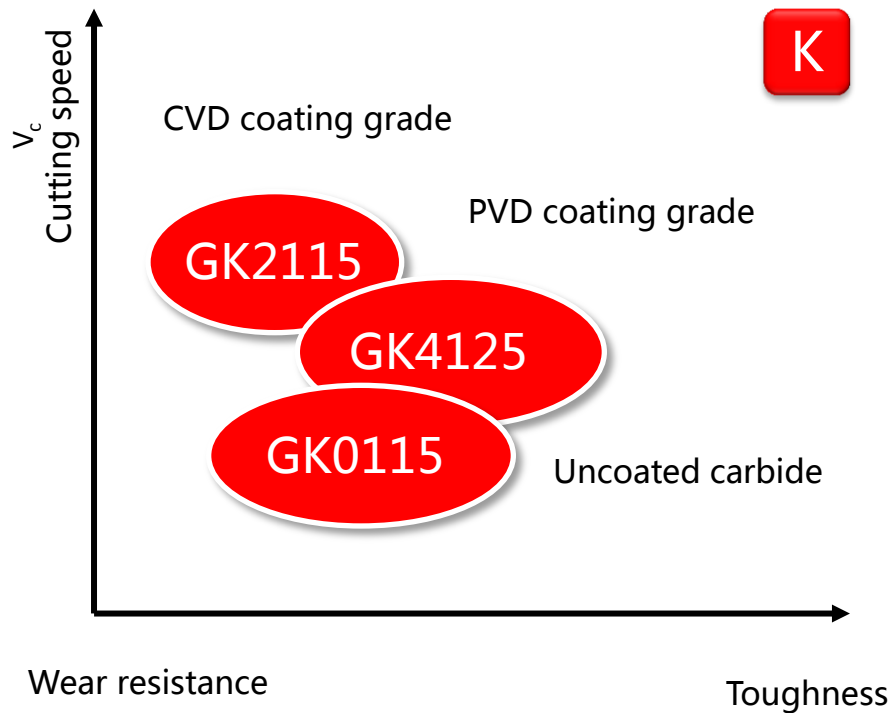
GA4230 products have special edge treatment to improve the edge security.

Steel General milling Grade GA4230-Test Case

Customers Test Reports

No.	Insert	Competitor	Tool life	material	Cutting dada	Applciation	Customer
1	GESAC GA4230 RDEW1204M0T-PM	GESAC GA4225 RDEW1204M0T-PM	120%	40Cr (220-250HB)	Vc=168m/min fz=1.37mm/z ap=0.25mm	Rough Profile Milling	Domestic
2	GESAC GA4230 RDEW1204M0T-PM	GESAC GA4225 RDEW1204M0T-PM	130%	50# Steel 22-23HRC	Vc=158m/min fz=0.687mm ap=1mm	Rough Pocket milling	Domestic
3	GESAC GA4230 RPEW1204M0T	MITSUBISHI VP15TF RPEW1204M0-JS	130-150%	DAC Mold steel 46HRC	Vc=316m/min fz=0.31mm ap=1mm	Semi-finish Pocket Milling	Domestic
4	GESAC GA4230 RDEW1204M0T-PM	DIJAE JC5118 RDMT1204M0T	120%	42CrMo 28-32HRC	Vc=236m/min fz=0.5mm ap=0.1mm	Rough Profile Milling	Domestic
5	GESAC GA4230 RDEW1204M0T-PM	SH4020 RDMW1204M0TN.HS	100%	P20 (30-32HRC)	Vc=158m/min fz=1.09mm/z ap=0.7mm	Rough Profile Milling	Domestic
6	GESAC GA4230 APMT1135DER-PM	Tagutec DP5320 APMT1135PDER	115%	40Cr (263-283HB)	Vc=113m/min fz=0.44mm/z ap=0.3mm	Rough Profile Milling	Domestic
7	GESAC GA4230 RPEW1003M0T	Tagutec DP5320 RPMW1003M0	90-100%	H13 Mold Steel 45HRC	Vc=151/310m/min fz=0.875/0.45mm ap=0.5mm	Semi-finish and Finish profile Milling	Domestic
8	GESAC GA4230 APMT1135PDER-PM	Toshiba AH120 APMT1135PDER-M04	100%	H13 Mold Steel 46HRC	Vc=173m/min fz=0.57mm ap=2mm	Shoulder Milling	Domestic

1.3 Сплавы для чугуна



1

GK2115^{NEW}

CVD покрытие, подходит для финишной и полу-черновой обработки серого чугуна,

2

высокая износостойкость.

GK4125

Новое TiAlN покрытие на микро-зернистой подложке, имеет высокую адгезионную стойкость, отличная стойкость и износостойкость. Подходит для общей обработки чугуна с шаровидным графитом и серого чугуна при полу-чистовой и полу-черновой фрезеровке.

3

GK0115

Керамическое зерно без покрытия, великолепная стойкость к пластической деформации и адгезионная стойкость, используется для чистовой и полу-чистовой обработки.

(1) Сплав для обработки чугуна GK4125-PVD

Material

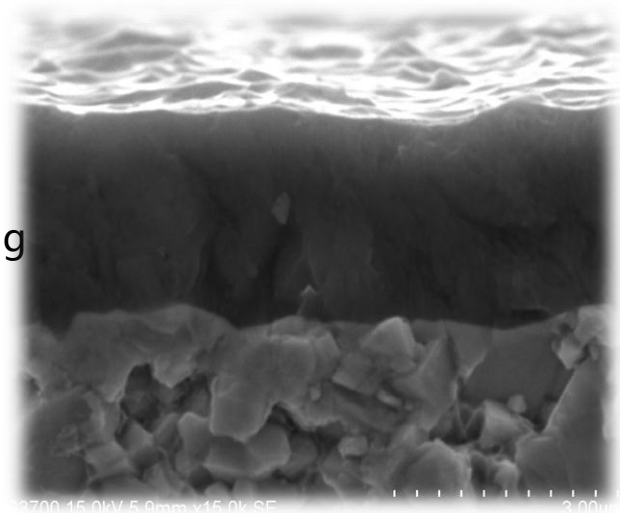
The new TiAlN coating on micro-grain carbide substrate has high adhesion strength ,excellent wear-resistance and toughness. Suitable for general cutting of nodular iron and gray iron in semi-finish and interrupt condition.

➤ The advantage of GK4125

- (1) Suitable for different kinds of cast iron cutting.
- (2) Achieving the best performance in medium and low cutting speed.
- (3) Cutting field very widely, mainly used for instable cutting
- (4) The best performance in nodular cast iron

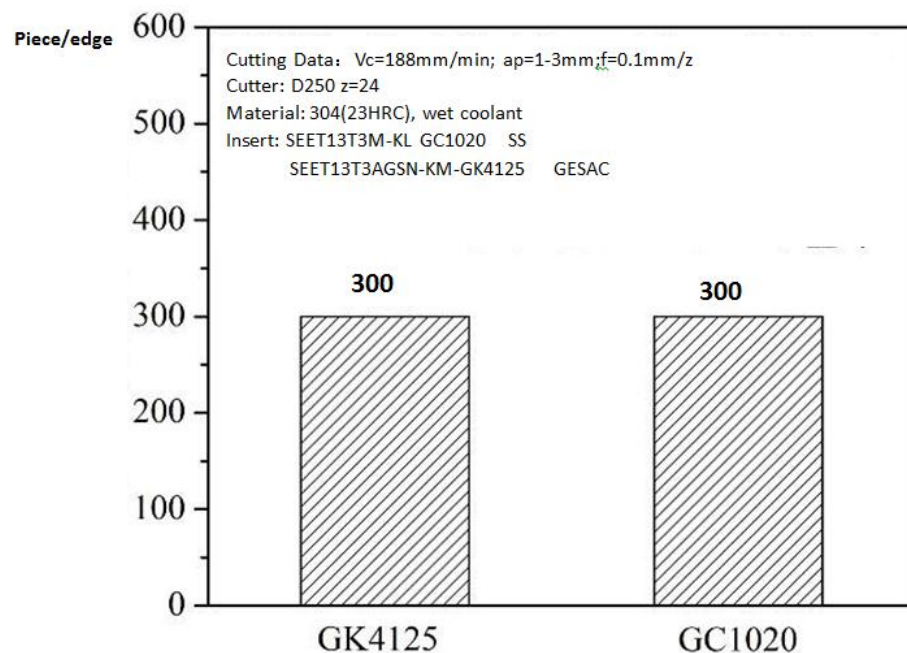
Exchangeable Grade :

Sandvik GC1020 Seco MK2050



Cast Iron Milling Grade GK4125-PVD Coating——Test Report

➤ Case 1 : Face Finish Milling Exhaust Pipe (QT450)



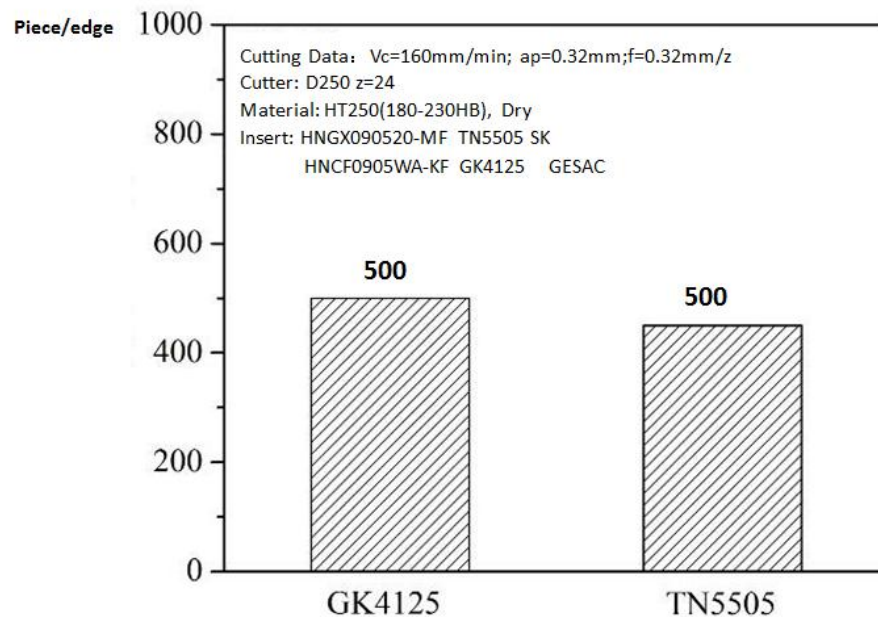
Customer Feedback :

The tool life of GESAC can achieve 300piece / edge , and our finish surface is better than SS.

➤ Case 2 : Face Finish Milling Cylinder Liner (HT250)



Workpeice



Customer Feedback :

The tool life of GESAC is more stable than SK.

(2) Сплав для обработки чугуна GK2115-CVD

Material

① Super micro-grain carbide substrate with Al₂O₃ Coating.

Excellent wear-resistance

② Special Binding Course

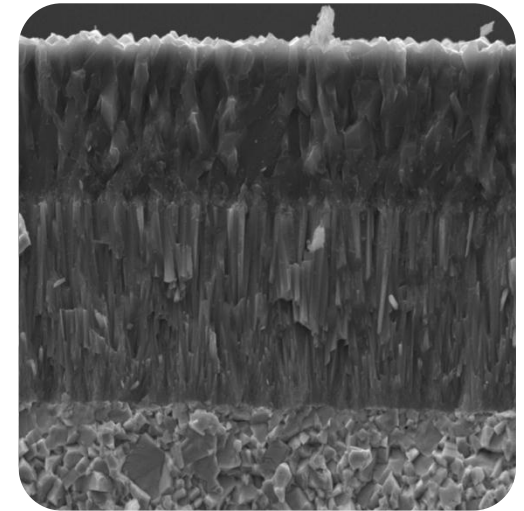
Improve the strength of binding

③ Tough MT-TiCN Coating

The perfect combination of toughness and wear-resistance.

④ Micro-grain Carbide Substrate Basal Body

Specific cast iron grade with excellent toughness and wear-resistance.



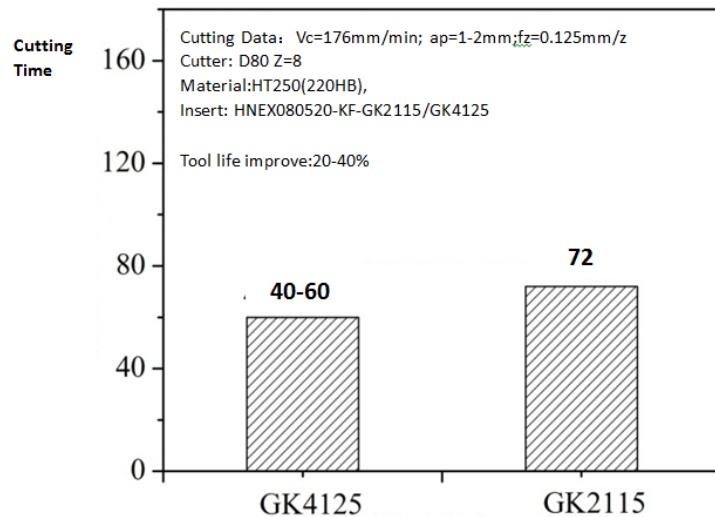
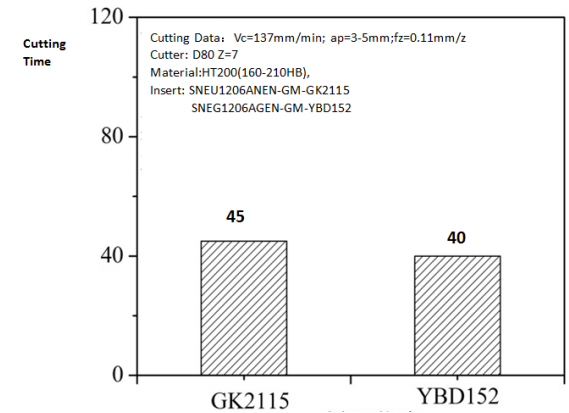
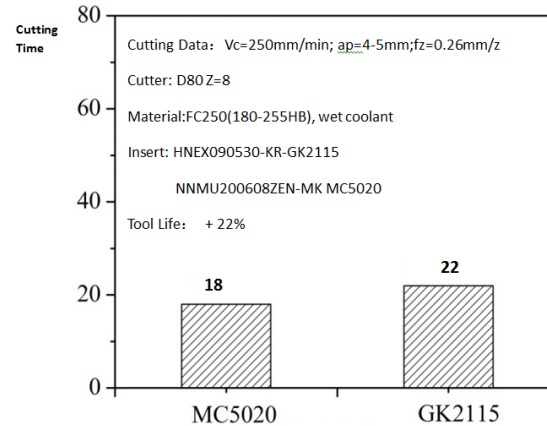
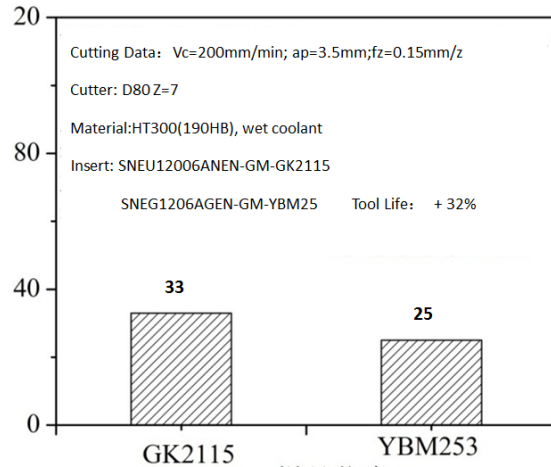
The difference with GK4125

➤ Differences

GK4125 coating with TiAlN-PVD

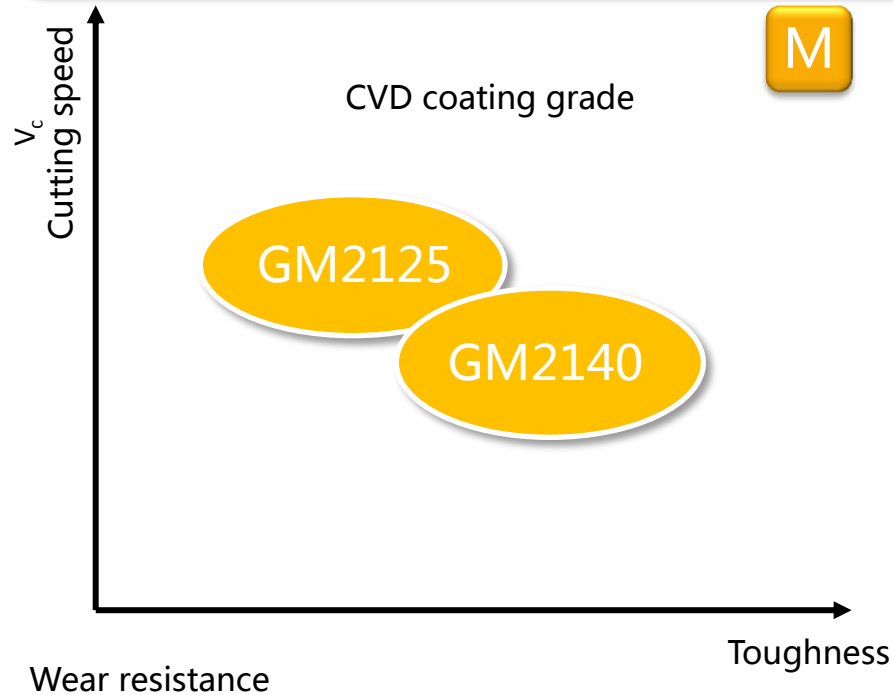
GK2125 use CVD coating, which have great toughness and wear-resistance.

Cast Iron Milling Grade GK2115-CVD Coating-Test Report



According to test feedback from customer. The performance of GK2115 grade can achieve over 90% compare with the common CVD grades in market, such as KW WKP25S , SS GC3220、 JS MK1500、 KT TT6800、 ZCC YBD151/ YBM251.

1.4 Сплавы для Нержавеющих сталей



1

GM2125 (Developing)

High strength CVD coating on great toughness carbide substrate .The first choice for stainless steel finish and semi-finish cutting under low and medium speed condition.

2

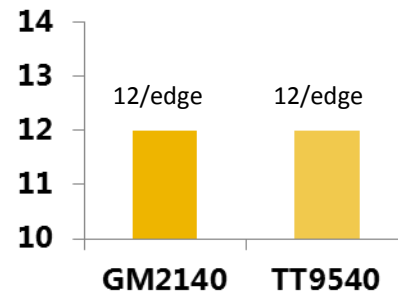
GM2140 (Developing)

Stainless steel rough milling CVD grade , great toughness combine with excellent antioxidant during high heat. The first choice for stainless steel rough cutting under low and medium speed condition.

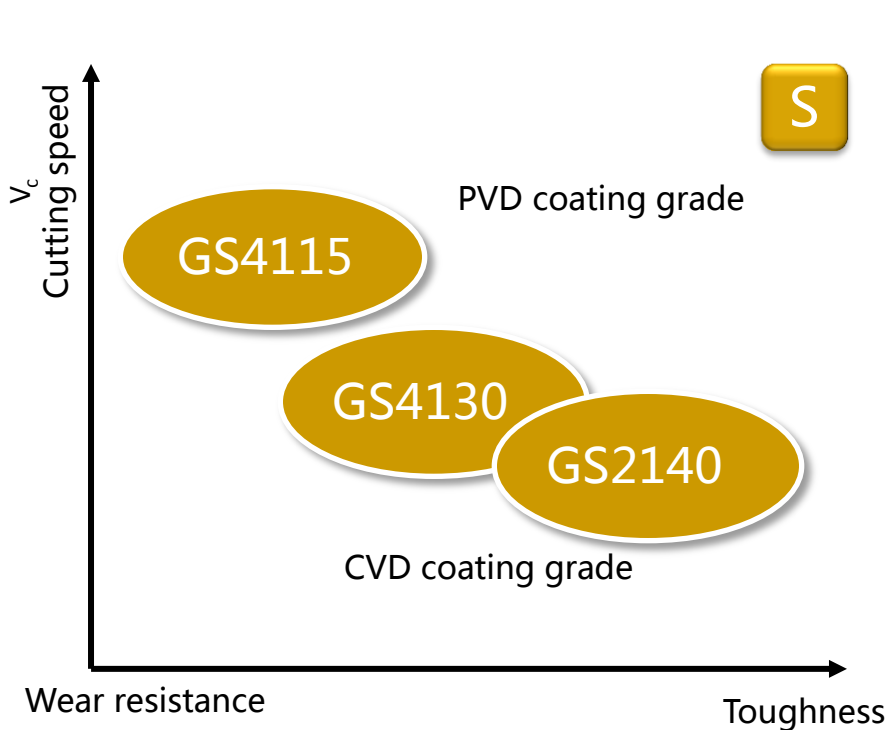


Case1

Cutting Data : $V_c=316\text{m/min}$, $a_p=2.5\text{mm}$,
 $f=0.28\text{mm/z}$;
Workpiece : 1Cr12Ni3Mo2VNbN-5b;
Insert : RPET1204M0-MM-GM2140
RYMX1205-MM-TT9540



1.5 Сплавы для Жаропрочных сплавов



1

GS4115 (Developing)

High strength PVD coating with great wear-resistance. mainly used for adhesion stainless steel and Heat-resistance material milling under stable condition

2

GS4130 (Developing)

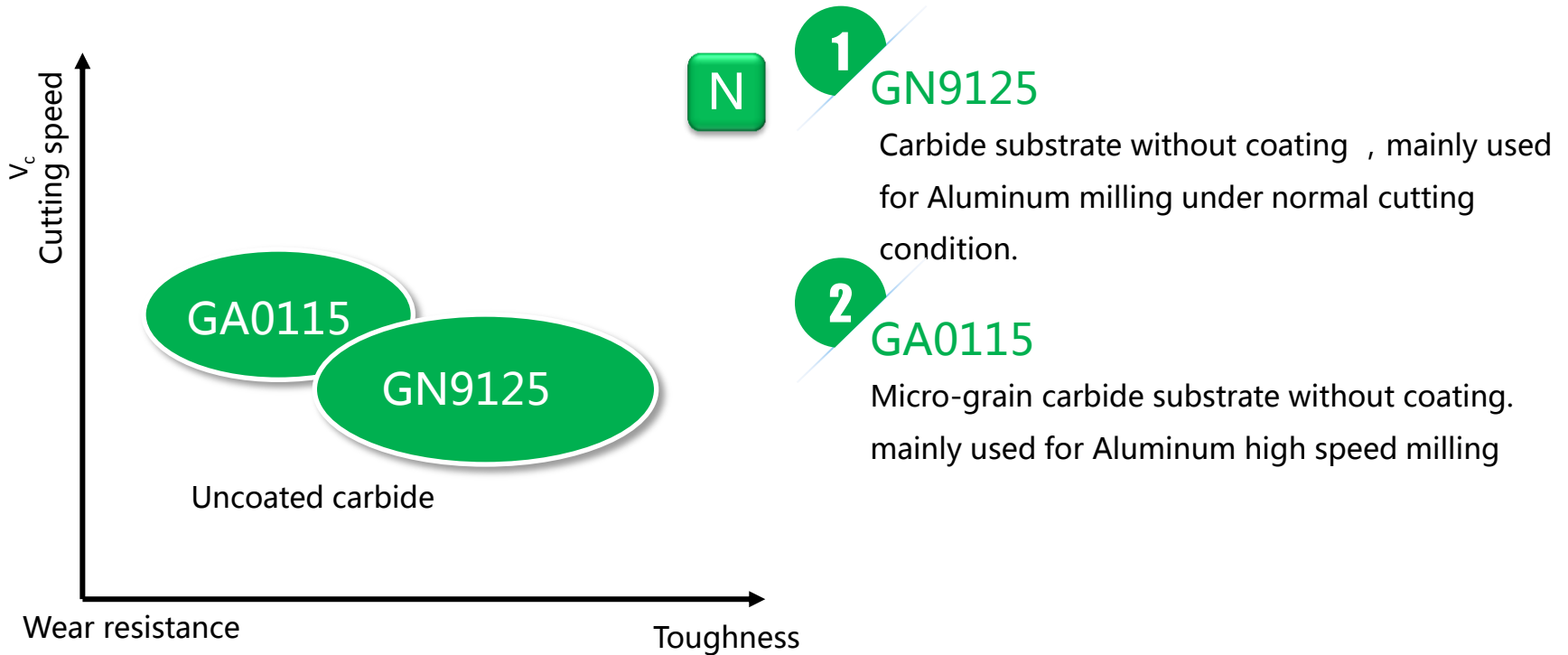
PVD Coating , the best choice for titanium milling.suitable for semi-finish and semi-rough heat-resistance material cutting. Our high feed milling products work with this grade very well.

3

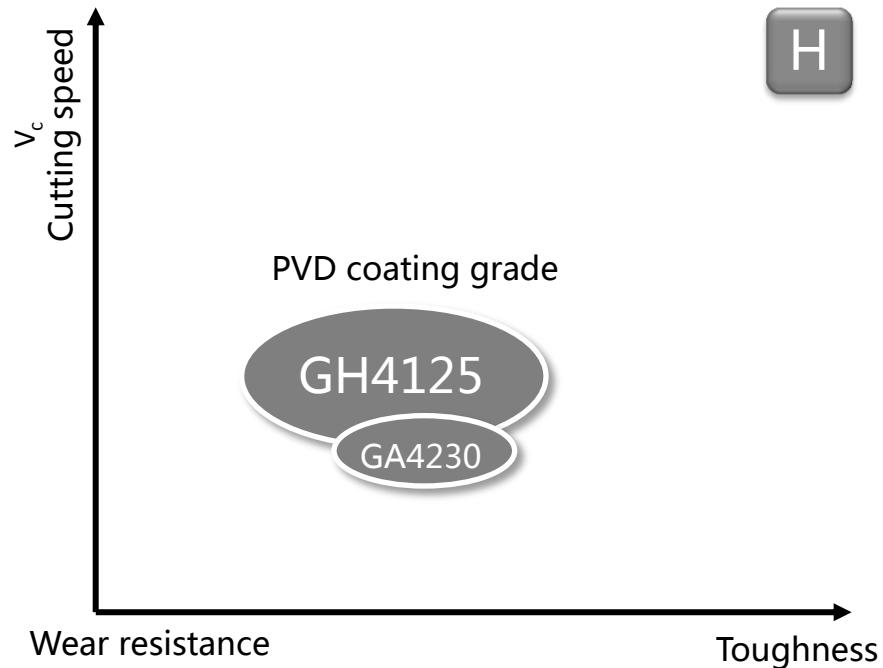
GS2140 (Planning)

CVD coating , The first choice for titanium milling under high tough demand.

1.6 Сплавы для Цветных сплавов



1.7 Сплавы для Закаленных сталей



1

GH4125(Developing)

Super micro-grain carbide substrate ,The best choice for 50-60HRC material cutting, worked with QTD ball nose products very well.

2

GA4230

The maximum hardness can achieve 50 HRC under normal cutting condition

2

Ознакомление с фрезерным инструментом



2.1 Ознакомление

» Фрезерование поверхности

【SEET+MFA145】



Single-side 45°
General Face Milling

【ODKT+MFA143】



Single-side 43°
General Face Milling

【SNEU+MFB145&MFB245】



Double-side 45°
General Face Milling

【HNEX+MFB160】



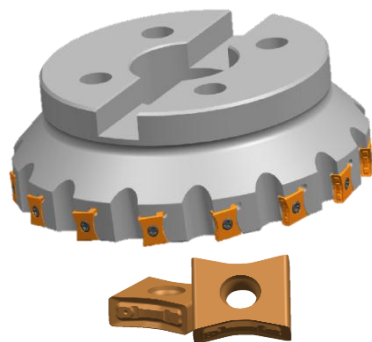
Double-side 60° Cast
iron Face Milling

- 【SEET+MFA145】 : 7 geometries and 4 grades ,Cover finish to rough milling for general materials ; Cutter Diameter : $\Phi 50\text{-}\Phi 125\text{mm}$.
- 【ODKT+MFA143】 : 5 geometries and 4 grades ,Cover finish to rough milling for general materials ; Cutter Diameter : $\Phi 40\text{-}\Phi 200\text{mm}$.
- 【SNEU+MFB145&MFB245】 : 5 geometries and 4 grades ,Cover finish to semi-finish milling for general materials ; Cutter Diameter : $\Phi 40\text{-}\Phi 315\text{mm}$.
- 【HNEX+MFB160】 : 5 geometries and 2 grades , suitable for finish to rough milling for cast iron Diameter : $\Phi 80\text{-}\Phi 315\text{mm}$.

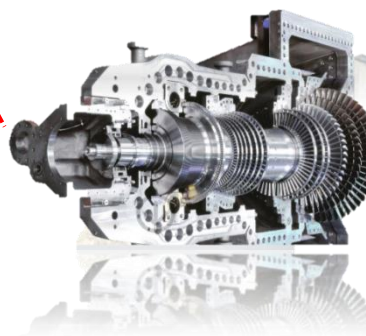
»» Для тяжелого фрезерования

[LNMT+MVA190]

NEW



**Tangential Double side 4 Heavy edge
Milling Tool**



- **[LNMT+MVA190]** : 2 geometries and 4 grades ,High efficiency milling from semi-finish to rough milling for general material. Stronger edge suit continue cutting large workpiece. ; Cutter diameter : $\Phi 50\text{-}\Phi 250\text{mm}$.

» Высокопроизводительные фрезы

【UD/UP+MKA110】



单面三刃快进给刀具

【SDMT+MKB113】



单面四刃快进给刀具

■ 【UD/UP+MKA110】 : 4 geometries and 3 grades .suit face and pocket milling from semi-finish to rough application
Cutter diameter : $\Phi 20$ - $\Phi 100$ mm.

■ 【SDMT+MKB113】 : 4 geometries , 4 grades , suit face and pocket milling with high feed application
Cutter Diameter : $\Phi 32$ - $\Phi 125$ mm.

2.4 Ознакомление

» Фрезерование уступов

【APMT+MEA190】



Single-side general
shoulder milling

【APKT+MEB190】



Single-side Helical
Edge Shoulder Milling

【ANKX+MEC190】



Double-side
Helical Edge
Shoulder Milling

【WNGU+MEE190】



Double-side 6 Edge
Shoulder Milling

【SDKT+MES190】

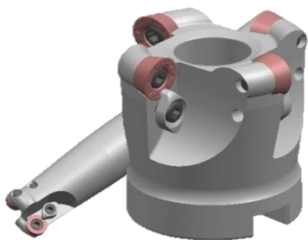


Single-side 4
Edge Shoulder
Milling

- 【 APMT+MEA190 】 : 4 geometries , 4 grades , Semi-finish to rough milling for general material
Cutter Diameter : $\Phi 16$ - $\Phi 125$ mm.
- 【 APKT+MEB190 】 : 4 geometries , 4 grades , 5 corner radius, finish to rough milling for general material
Cutter Diameter : $\Phi 16$ - $\Phi 125$ mm.
- 【 ANKX+MEC190 】 : 3 geometries , 4 grades , Semi-finish to rough milling for general material
Cutter Diameter : $\Phi 32$ - $\Phi 100$ mm.
- 【 WNGU+MEE190 】 : 1 geometries , 3 grades , finish to rough milling for cast iron
Cutter Diameter : $\Phi 50$ - $\Phi 125$ mm.
- 【 SDKT +MES190 】 : 1 geometries , 5 grades , Semi-finish to rough milling for general material
Cutter Diameter : $\Phi 40$ - $\Phi 125$ mm.

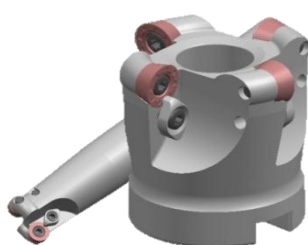
»» Профильное фрезерование

【RD+MPA100】



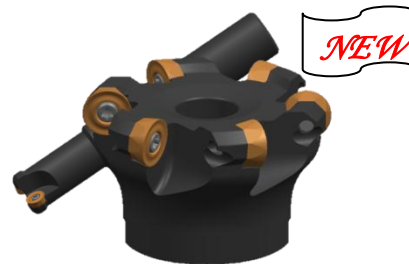
Single-side 15° Profile
Rough Milling

【RP+MPB100】



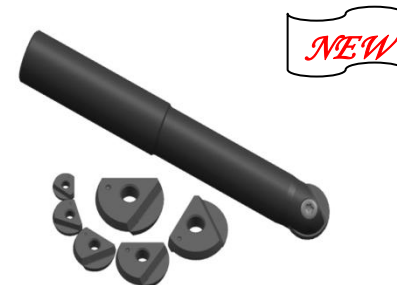
Single-side 11° Profile
Rough Milling

【RC+MPC100】



Single-side 7°
Profile Milling

【QTD+MBA100】



Ball Nose Profile
Finish Milling

- 【RD+MPA100】 : 5 geometries , 4 grades , Semi-finish to rough milling for general material ;
Cutter Diameter : $\Phi 10$ - $\Phi 125$ mm.
- 【RP+MPB100】 : 5 geometries , 4 grades , Semi-finish to rough milling for general material ;
Cutter Diameter : $\Phi 10$ - $\Phi 125$ mm.
- 【RC+MPC100】 : 5 geometries , 4 grades , Semi-finish to rough milling for stainless steel ;
Cutter Diameter : $\Phi 20$ - $\Phi 125$ mm.
- 【QTD+MBA100】 :
6 different radius insert , finish to semi-finish milling for high hardness steel ($\leq \text{HRC}55$) and cast iron
Cutter Diameter : $\Phi 12$ - $\Phi 32$ mm.

» Трехсторонние фрезы и фрезерование фасок

【SNEX+MSA104-108】



Narrow Slot Milling

【CNEU++MSA110-113】



Medium Slot Milling

【SPMT++MCA145】



45° Chamfer Milling

- 【SNEX+MSA104-108】 : 5 geometries , 4 grades , mainly used for small slotting and cut off for steel and cast iron
Cutter Diameter : $\Phi 100\text{-}\Phi 125\text{mm}$
- 【CNEU++MSA110-113】 : Slot width :10-13mm , 4 grades , mainly used for steel and cast iron machining
Cutter Diameter : $\Phi 80\text{-}\Phi 160\text{mm}$.
- 【SPMT++MCA145】 : CM geometry , 4 grades , used for chamfering and small face milling
Cutter Diameter : $\Phi 25\text{-}\Phi 32\text{mm}$.

Благодарим за внимание !

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