GÜHRING

Sharp extra short for 40 % higher milling performance

new

1D 超短刃長 提升40%銑削加工效率

RF100 SHARP

Solid carbide milling cutter for top performance
in soft, tough and high-alloyed materials

特別適用於軟質、韌性高及高合金鋼銑削，能展現最佳性能

OUR SHARPEST MILLING CUTTER

Specialist for soft, tough and high-alloyed materials

Milling soft, tough and high-alloyed materials presents particular challenges when it comes to the tool. If you choose the wrong one, you will end up with chips that stick and jam – causing the tool to break. With our sharpest solid carbide milling cutter to date, you don‘t have to worry as you’ll achieve high-quality machining results.

如果您對於銑削軟質、堅韌及高合金材料是一種挑戰，如果您選擇了錯誤的刀具，最終會產生刃口口粘屑，從而導致刀具斷裂。請使用我們迄今為止最鋒利的鎢鋼銑刀，您無需擔心，因為您將獲得高品質的加工結果。

exceptionally easy cutting
in soft, tough & high-alloyed materials
with a tensile strength of 300 – 900 N/mm²

在軟質、韌性高及高合金材料、非常容易銑削
適用拉伸強度在 300 – 900 N/mm²

full flexibility in milling operations
slotting, roughing, ramping, helical, finishing

各種銑削加工皆可彈性應用
開槽、粗加工、斜向進刀工、螺旋下刀、精加工

powerful & smooth
on all machines

銑削強而有力而且平順
幾乎所有機器皆適用

application-oriented construction dimensions
for cost-efficient machining

應用於結構尺寸要求加工
經濟效益高

RF100 SHARP


各種鋼材 Steel
P
不銹鋼 Stainless steel
M
鋁合金 Aluminium
N
特殊合金 Special alloys
S

FROM UNSTABLE TO HPC

MTC 工況不穩定 及 HPC 高速度、高效率加工皆適用

Powerful on all machines

The RF 100 Sharp solid carbide milling cutter is designed to cover all of the different operating conditions – and always achieves outstanding results.

RF 100 Sharp 鎢鋼銑刀，滿足所有不同的操作條件 – 並且始終得到優異的加工成果。

MTC

Application example

Effective, quiet milling on weaker machines and unstable clamping.

應用實例
對於較差的機器與不穩定的工件夾持一樣可以有效地達到平順的銑削。

Machine	Spinner TC 600 CNC lathe　CNC車床
Milling tool	RF 100 Sharp, art. no. 6478, Ø 10 mm, Z=4
Operating conditions	MTC　工況不穩定
Milling operation	Hexagonal milling　六角型銑削
Tool holder	BMT Life Tool ER 25 collet chuck　ER 25筒夾夾持
Material/component	1.7131or 16MnCr5 / shaft　合金鋼
Cutting parameters	切削速度 v_c 130 m/min
	轉速 **S** 4,138 rpm
	每刃進給 f_z 0.07 mm
	每分鐘進給 v_f 1,158 mm/min
	切寬 a_e 8 mm
	切深 a_p 3.8 mm
	Metal removal rate Q 35 cm^3/min　每分鐘移除量
	Tool life 78 min　刀具壽命

Short machining times and long tool lives

加工時間縮短及高壽命表現

- **tough carbide** 堅韌的鎢鋼材質
  prevents tool breakage even under very unstable conditions
  即使在非常不穩定的加工狀況，也能避免刀具崩裂
- **AlCrN coating** AlCrN 鍍層
  provides optimum wear protection at all cutting speeds
  在任何的切削情況下提供最佳的磨耗保護
- **optimised facet grinding** 最佳化的端面研磨
  dampens vibrations and increases smoothness and service life
  抑制振動並提高平順度和使用壽命
- **corner protection chamfer** 刃口倒角保護
  provides more stability and edge strength
  提供更高的穩定性和刃口強度

HPC

Application example

High-performance milling with extremely high cutting speeds under stable operating conditions.

應用實例

高性能銑削、在極高的切削速度下與穩定的運轉條件下。

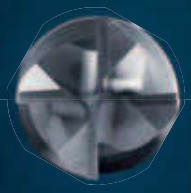
Machine	CNC BAZ DMG DMU 100 P
Milling tool	RF 100 Sharp, art. no. 6479, Ø 16 mm, Z=4
Operating conditions	HPC 高效率銑削
Milling operation	Contour roughing 輪廓粗加工
Tool holder	HSK 100 A GühroJet Weldon tool holder HSK 100 A 側固式刀桿
Material/component	1.0503 or C45 / block 中碳鋼 C45

Cutting parameters		
	切削速度 v_c	180 m/min
	轉速 **S**	3,580 rpm
	每刃進給 f_z	0.1 mm
	每分鐘進給 v_f	1,430 mm/min
	切寬 a_e	6 mm
	切深 a_p	34 mm
	Metal removal rate Q	291 cm^3/min 每分鐘移除量
	Tool life	134 min 刀具壽命

THE EXTRA SHORT 超短刃長型

Ressource-efficient and economical thanks to lower material consumption

資源使用效率高且經濟
材料消耗較低



SPECIAL FRONT END **特殊端刃刃口**
for slot drilling and high ramping angles
適合開槽與斜向進刀使用

銑削性能提高 40%

new

40 % HIGHER MILLING PERFOMANCE
thanks to more compact dimensions

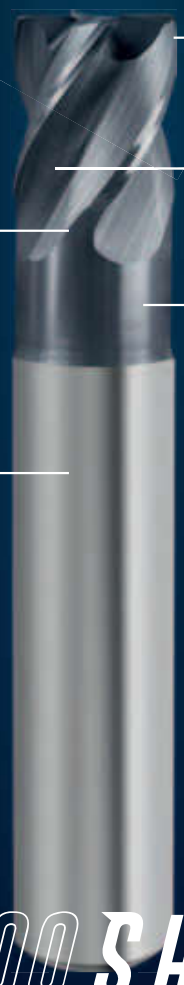
1D短刃刀口
1XD CUTTING EDGE LENGTH
maximum feed rate when slotting
開槽可以最大進給率

AlCrN COATING **AlCrN 鍍層**
for highest wear resistance
最佳磨耗保護

超短設計
EXTRA SHORT DESIGN
maximum stability and
hardly any radial deflection
最大穩定性
幾乎沒有任何徑向偏轉

2xD THE REACH **含頸部加工長達2D**
for more flexibility
with deeper contours
可更彈性應用於較深的銑削

堅韌的鎢鋼材質
EXTRA-TOUGH CUTTING MATERIAL
prevents damage to cutting edges
even under unstable conditions
保護切削刃口
即使在不穩定的工況下



RF100 SHARP
EXTRA SHORT

EXTRA SHORT

Application example

HSC slot drilling in the micro range with Ø 1 mm in stainless steel and high-performance slotting Ø 10 mm in C45 steel.

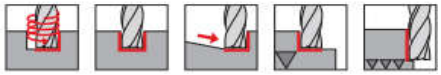
應用實例
微小範圍內的 HSC開槽銑削 ψ 1 mm 不鏽鋼材質，
以及高性能開槽 ψ 10 mm C45中碳鋼銑削。

Machine	Core micro	
Milling tool	RF 100 Sharp extra short, art. no. 6938, Ø 1 mm, Z=4	
Milling operation	Plunging + slotting (slot drilling) 鑽銑與開槽	
Tool holder	HSK-E40 precision collet chuck holders HSK-E40 筒夾夾持	
Cooling	Emulsion 水溶性切削液	
Material	INOX 1.4301 不銹鋼 SUS304	
Cutting parameters	切削速度 **v_c**	70 m/min
	轉速 **S**	22,282 rpm
	開槽每刃進給 **f_z**	Slotting 0.01 mm
	開槽每分鐘進給 **v_f**	Slotting 891 mm/min
	鑽銑每刃進給 **f_z**	Plunging 0.002 mm
	鑽銑每分鐘進給 **v_f**	Plunging 178 mm/min
	切寬 **a_e**	1 mm
	切深 **a_p**	0.8 mm
	Metal removal rate Q	Slotting 0.7 cm^3/min 每分鐘移除量
	刀具壽命 **Tool life**	1,850 slots (10.5 mm long each)

Machine	MAG NBV 700	
Milling tool	RF 100 Sharp extra short, art. no. 6938, Ø 10 mm, Z=4	
Milling operation	Slotting 開槽銑削	
Tool holder	HPC clamping chuck HSK-A 63 HPC HSK-A 63	
Cooling	Air 吹空氣	
Material	C45 中碳鋼	
Cutting parameters	切削速度 **v_c**	180 m/min
	轉速 **S**	5,730 rpm
	每刃進給 **f_z**	0.08 mm
	每分鐘進給 **v_f**	1,833 mm/min
	切深 **a_e**	10 mm
	切寬 **a_p**	10 mm
	Metal removal rate Q	183.3 cm^3/min 每分鐘移除量
	刀具壽命 **Tool life**	113 min

RF 100 Sharp extra short　四刃 1D短刃型　銑削性能提高 40%　　編號 : 6938

P	M	K	N	S	H
●	●		●	●	



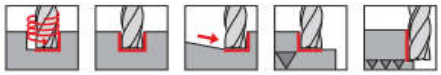
especially for soft, tough and high-alloyed materials • neck clearance • centre cutting • 40% higher milling performance thanks to short stable design • with special front end

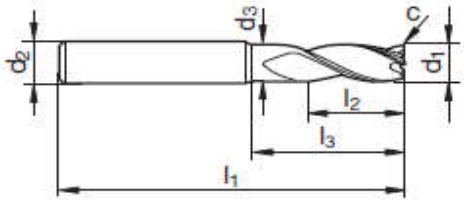
特別適用於軟質、堅韌和高合金材料 • 頸部離隙•底刃過中心可切削

短刃穩定型設計使銑削性能提高 40%•前端底刃經特殊設計

RF 100 Sharp extra short　四刃 1D短刃型　銑削性能提高 40%　　編號 : 6939

P	M	K	N	S	H
●	●		●	●	





編號 :								6938	6939
d1(e8) 刃徑	d2(h6) 柄徑	d3 頸部	全長 l_1	刃長 l_2	可切削長 l_3	端刃倒角	刃數	價格	價格
mm	mm	mm	mm	mm	mm	mm x 45°	Z		
0.80	4.00	0.75	40.00	0.80	1.70	0.00	4	1,040	
1.00	4.00	0.92	40.00	1.00	2.10	0.01	4	1,040	
1.20	4.00	1.12	40.00	1.20	2.50	0.01	4	1,040	
1.40	4.00	1.32	40.00	1.40	2.90	0.01	4	1,040	
1.50	4.00	1.40	40.00	1.50	3.20	0.01	4	1,040	
1.60	4.00	1.50	40.00	1.60	3.40	0.01	4	1,040	
1.80	4.00	1.70	40.00	1.80	3.80	0.01	4	1,040	
2.00	6.00	1.85	50.00	2.00	4.20	0.02	4	1,040	
2.50	6.00	2.35	50.00	2.50	5.30	0.02	4	1,040	
2.80	6.00	2.65	50.00	2.80	5.90	0.02	4	1,040	
3.00	6.00	2.85	50.00	3.00	6.30	0.03	4	1,040	
3.50	6.00	3.30	50.00	3.50	7.40	0.03	4	1,040	1,080
3.80	6.00	3.60	50.00	3.80	8.00	0.03	4	1,040	1,080
4.00	6.00	3.80	50.00	4.00	8.40	0.04	4	1,040	1,080
4.50	6.00	4.30	50.00	4.50	9.50	0.04	4	1,040	1,080
4.80	6.00	4.60	50.00	4.80	10.10	0.04	4	1,040	1,080
5.00	6.00	4.80	50.00	5.00	10.50	0.05	4	1,040	1,080
5.50	6.00	5.30	50.00	5.50	12.00	0.05	4	1,040	1,080
5.70	6.00	5.50	50.00	5.70	12.00	0.05	4	1,040	1,080
6.00	6.00	5.70	50.00	6.00	12.00	0.06	4	1,040	1,080
6.70	8.00	6.40	55.00	6.70	16.00	0.06	4	1,400	1,480
7.00	8.00	6.70	55.00	7.00	16.00	0.07	4	1,400	1,480
7.70	8.00	7.40	55.00	7.70	16.00	0.07	4	1,400	1,480
8.00	8.00	7.70	55.00	8.00	16.00	0.08	4	1,400	1,480
9.00	10.00	8.70	61.00	9.00	20.00	0.09	4	2,140	2,210
9.70	10.00	9.40	61.00	9.70	20.00	0.09	4	2,140	2,210
10.00	10.00	9.50	61.00	10.00	20.00	0.10	4	2,140	2,210
11.00	12.00	10.50	70.00	11.00	24.00	0.11	4	2,770	2,830
11.70	12.00	11.20	70.00	11.70	24.00	0.11	4	2,770	2,830
12.00	12.00	11.50	70.00	12.00	24.00	0.12	4	2,770	2,830
14.00	14.00	13.50	75.00	14.00	28.00	0.14	4	3,650	3,750
15.60	16.00	15.10	82.00	15.60	32.00	0.15	4	4,770	4,890
16.00	16.00	15.50	82.00	16.00	32.00	0.16	4	4,770	4,890

短柄型 小徑 RF 100 Sharp 銑刀 1D短刃型

Ratio end mill sets RF 100 Sharp short shank Article no. **6163**

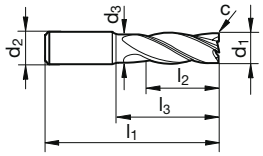
You can find cutting data in our online navigator at https://webnavigator.guehring.de.

NEW VHM P NH WN Cyl

P	M	K	N	S	H
●	●		●	●	

especially for soft, tough and high-alloyed materials • neck clearance • centre cutting • 40% higher milling performance thanks to short stable design • with special front end

特別適用於軟性、韌性高的高合金材料。頸部離隙/ 底刃過中心可切削



刃長

編號： **6163**

d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Price
0.80	4.00	0.75	30	0.8	1.7	0.00	4	1,100
1.00	4.00	0.92	30	1.0	2.1	0.01	4	1,100
1.20	4.00	1.12	30	1.2	2.5	0.01	4	1,100
1.40	4.00	1.32	30	1.4	2.9	0.01	4	1,100
1.50	4.00	1.40	30	1.5	3.2	0.01	4	1,100
1.60	4.00	1.50	30	1.6	3.4	0.01	4	1,100
1.80	4.00	1.70	30	1.8	3.8	0.01	4	1,100
2.00	6.00	1.85	35	2.0	4.2	0.02	4	1,100
2.50	6.00	2.35	35	2.5	5.3	0.02	4	1,100
2.80	6.00	2.65	35	2.8	5.9	0.02	4	1,100
3.00	6.00	2.85	35	3.0	6.3	0.03	4	1,100

短柄型 小徑 RF 100 Sharp 銑刀 長刃型

Ratio end mill sets RF 100 Sharp short shank Article no. **6164**

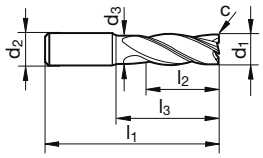
You can find cutting data in our online navigator at https://webnavigator.guehring.de.

NEW VHM P NH WN Cyl

P	M	K	N	S	H
●	●		●	●	

especially for soft, tough and high-alloyed materials • longer cutting edge than DIN 6527 L • neck clearance • centre cutting

特別適用於軟性、韌性高的高合金材料。頸部離隙/ 底刃過中心可切削

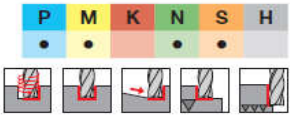


刃長

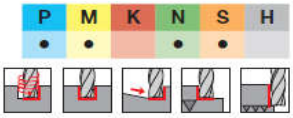
編號： **6164**

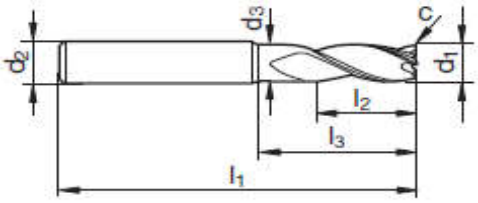
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Price
1.00	4.00	0.92	33	3.0	4.0	0.02	4	1,100
1.50	4.00	1.40	33	4.5	6.0	0.03	4	1,100
2.00	6.00	1.85	43	6.0	8.0	0.04	4	1,200
2.50	6.00	2.35	43	7.5	10.0	0.05	4	1,200
3.00	6.00	2.85	43	10.0	15.0	0.06	4	1,200

RF 100 Sharp 四刃 不等分割 標準長　　編號 ：6478



RF 100 Sharp 四刃 不等分割 標準長　　編號 ： 6479

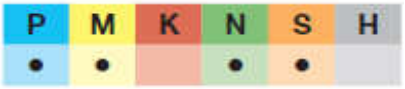


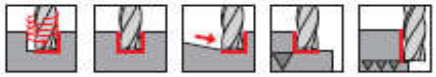


編號：								6478	6479
d1(e8) 刃徑	d2(h6) 柄徑	d3 頸部	全長 l_1	刃長 l_2	可切削長 l_3	端刃倒角	刃數	價格	價格
mm	mm	mm	mm	mm	mm	mm x 45°	Z		
1.00	4.00	0.92	50.00	3.00	4.00	0.02	4	1,100	
1.50	4.00	1.40	50.00	4.50	6.00	0.03	4	1,100	
2.00	6.00	1.85	50.00	6.00	8.00	0.04	4	1,200	
2.50	6.00	2.35	50.00	7.50	10.00	0.05	4	1,200	
3.00	6.00	2.85	57.00	10.00	15.00	0.06	4	1,200	
4.00	6.00	3.80	57.00	14.00	18.00	0.08	4	1,200	1,300
5.00	6.00	4.80	57.00	15.00	20.00	0.10	4	1,200	1,300
6.00	6.00	5.70	57.00	16.00	20.00	0.12	4	1,200	1,300
8.00	8.00	7.70	63.00	21.00	26.00	0.16	4	1,700	1,700
10.00	10.00	9.50	72.00	25.00	31.00	0.20	4	2,500	2,600
12.00	12.00	11.50	83.00	28.00	37.00	0.24	4	3,300	3,300
14.00	14.00	13.50	83.00	28.00	37.00	0.28	4	4,300	4,400
16.00	16.00	15.50	92.00	36.00	43.00	0.32	4	5,600	5,800
20.00	20.00	19.50	104.00	41.00	53.00	0.40	4	8,600	8,800

RF 100 Sharp 4刃不等分割 頸部加長型

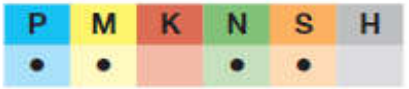
編號 : 6480

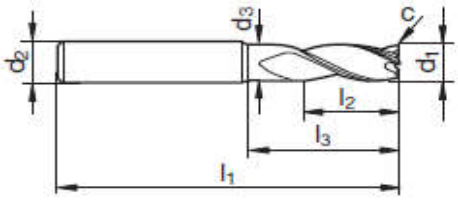




RF 100 Sharp 4刃不等分割 頸部加長型

編號 : 6481





編號 :								6480	6481
d1(e8) 刃徑	d2(h6) 柄徑	d3 頸部	全長 l_1	刃長 l_2	可切削長 l_3	端刃倒角	刃數	價格	價格
mm	mm	mm	mm	mm	mm	mm x 45°	Z		
1.00	4.00	0.92	50.00	3.00	5.50	0.02	4	1,500	
1.50	4.00	1.40	50.00	4.50	8.50	0.03	4	1,500	
2.00	6.00	1.85	57.00	6.00	11.50	0.04	4	1,550	
2.50	6.00	2.35	57.00	7.50	14.50	0.05	4	1,550	
3.00	6.00	2.85	65.00	10.00	20.00	0.06	4	1,600	
4.00	6.00	3.80	65.00	14.00	27.00	0.08	4	1,600	1,650
5.00	6.00	4.80	65.00	15.00	28.00	0.10	4	1,600	1,650
6.00	6.00	5.70	75.00	19.00	38.00	0.12	4	1,600	1,650
8.00	8.00	7.70	80.00	21.00	43.00	0.16	4	2,110	2,160
10.00	10.00	9.50	93.00	26.00	52.00	0.20	4	3,130	3,230
12.00	12.00	11.50	100.00	28.00	54.00	0.24	4	4,070	4,180
14.00	14.00	13.50	100.00	28.00	54.00	0.28	4	5,320	5,460
16.00	16.00	15.50	123.00	38.00	74.00	0.32	4	7,030	7,180
20.00	20.00	19.50	126.00	41.00	75.00	0.40	4	10,730	10,890

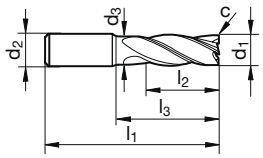
短柄型 小徑 RF 100 Sharp 銑刀 長刃頸部加長型

Ratio end mill sets RF 100 Sharp short shank Article no. **6165**

You can find cutting data in our online navigator at https://webnavigator.guehring.de.

P	M	K	N	S	H
●	●		●	●	

especially for soft, tough and high-alloyed materials • medium length version • neck clearance • centre cutting 特別適用於軟性、韌性高的高合金材料。頸部離隙/ 底刃過中心可切削

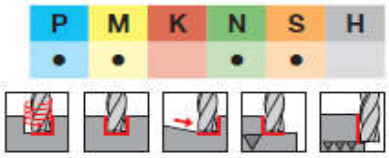


刃長 頸長

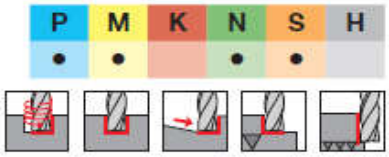
編號： **6165**

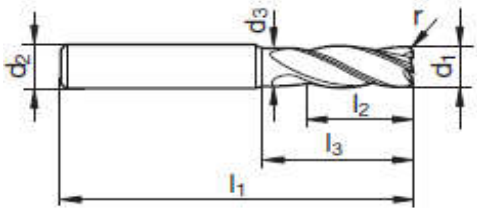
d1 e8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Price
1.00	4.00	0.92	36	3.0	5.5	0.02	4	1,500
1.50	4.00	1.40	36	4.5	8.5	0.03	4	1,500
2.00	6.00	1.85	44	6.0	11.5	0.04	4	1,600
2.50	6.00	2.35	44	7.5	14.5	0.05	4	1,600
3.00	6.00	2.85	48	10.0	20.0	0.06	4	1,600

RF 100 Sharp 4刃不等分割 標準長 圓鼻型　　編號 : 6962



RF 100 Sharp 4刃不等分割 標準長 圓鼻型　　編號 : 6963





								編號 :	6962	6963
d1(e8) 刃徑	d2(h6) 柄徑	d3 頸部	全長 l_1	刃長 l_2	可切削長 l_3	r	刃數	Code	價格	價格
mm	mm	mm	mm	mm	mm	mm	Z			
3.00	6.00	2.85	57.00	8.00	15.00	0.20	4	3.002	1,820	1,870
3.00	6.00	2.85	57.00	8.00	15.00	0.50	4	3.005	1,820	1,870
4.00	6.00	3.80	57.00	11.00	18.00	0.20	4	4.002	1,790	1,840
4.00	6.00	3.80	57.00	11.00	18.00	0.50	4	4.005	1,790	1,840
4.00	6.00	3.80	57.00	11.00	18.00	1.00	4	4.010	1,790	1,840
5.00	6.00	4.80	57.00	13.00	18.00	0.20	4	5.002	1,740	1,790
5.00	6.00	4.80	57.00	13.00	18.00	0.50	4	5.005	1,740	1,790
5.00	6.00	4.80	57.00	13.00	18.00	1.00	4	5.010	1,740	1,790
6.00	6.00	5.70	57.00	13.00	20.00	0.20	4	6.002	1,690	1,740
6.00	6.00	5.70	57.00	13.00	20.00	0.50	4	6.005	1,690	1,740
6.00	6.00	5.70	57.00	13.00	20.00	1.00	4	6.010	1,690	1,740
6.00	6.00	5.70	57.00	13.00	20.00	1.50	4	6.015	1,690	1,740
8.00	8.00	7.70	63.00	19.00	26.00	0.30	4	8.003	2,280	2,390
8.00	8.00	7.70	63.00	19.00	26.00	0.50	4	8.005	2,280	2,390
8.00	8.00	7.70	63.00	19.00	26.00	1.00	4	8.010	2,280	2,390
8.00	8.00	7.70	63.00	19.00	26.00	1.50	4	8.015	2,280	2,390
8.00	8.00	7.70	63.00	19.00	26.00	2.00	4	8.020	2,280	2,390
10.00	10.00	9.50	72.00	22.00	31.00	0.30	4	10.003	3,190	3,270
10.00	10.00	9.50	72.00	22.00	31.00	0.50	4	10.005	3,190	3,270
10.00	10.00	9.50	72.00	22.00	31.00	1.00	4	10.010	3,190	3,270
10.00	10.00	9.50	72.00	22.00	31.00	1.50	4	10.015	3,190	3,270
10.00	10.00	9.50	72.00	22.00	31.00	2.00	4	10.020	3,190	3,270
10.00	10.00	9.50	72.00	22.00	31.00	2.50	4	10.025	3,190	3,270
12.00	12.00	11.50	83.00	26.00	37.00	0.30	4	12.003	4,130	4,210
12.00	12.00	11.50	83.00	26.00	37.00	0.50	4	12.005	4,130	4,210
12.00	12.00	11.50	83.00	26.00	37.00	1.00	4	12.010	4,130	4,210
12.00	12.00	11.50	83.00	26.00	37.00	1.50	4	12.015	4,130	4,210
12.00	12.00	11.50	83.00	26.00	37.00	2.00	4	12.020	4,130	4,210
12.00	12.00	11.50	83.00	26.00	37.00	2.50	4	12.025	4,130	4,210
12.00	12.00	11.50	83.00	26.00	37.00	3.00	4	12.030	4,130	4,210
16.00	16.00	15.50	92.00	32.00	43.00	0.50	4	16.005	6,490	6,700
16.00	16.00	15.50	92.00	32.00	43.00	1.00	4	16.010	6,490	6,700
16.00	16.00	15.50	92.00	32.00	43.00	1.50	4	16.015	6,490	6,700
16.00	16.00	15.50	92.00	32.00	43.00	2.00	4	16.020	6,490	6,700
16.00	16.00	15.50	92.00	32.00	43.00	2.50	4	16.025	6,490	6,700
16.00	16.00	15.50	92.00	32.00	43.00	3.00	4	16.030	6,490	6,700
16.00	16.00	15.50	92.00	32.00	43.00	4.00	4	16.040	6,490	6,700
20.00	20.00	19.50	104.00	38.00	53.00	0.50	4	20.005	9,920	10,070
20.00	20.00	19.50	104.00	38.00	53.00	1.00	4	20.010	9,920	10,070
20.00	20.00	19.50	104.00	38.00	53.00	1.50	4	20.015	9,920	10,070
20.00	20.00	19.50	104.00	38.00	53.00	2.00	4	20.020	9,920	10,070
20.00	20.00	19.50	104.00	38.00	53.00	2.50	4	20.025	9,920	10,070
20.00	20.00	19.50	104.00	38.00	53.00	3.00	4	20.030	9,920	10,070
20.00	20.00	19.50	104.00	38.00	53.00	4.00	4	20.040	9,920	10,070

Ratio end mill sets RF 100 Sharp extra short

Article no. **6468**

VHM | P | N | WN | 38° | XS | 4 | HA | 45° | 12°

P	M	K	N	S	H
●	●		●	●	

especially for soft, tough and high-alloyed materials • 40% higher milling performance thanks to short stable design • neck clearance • special front end • consisting of art. no. 6938

Article no. **6468**

Ø-range mm	Pieces/set	Order no.	價格
6/8/10/12	4	6468 1.000	6,500

Ratio end mill sets RF 100 Sharp extra short

Article no. **6469**

VHM | P | N | WN | 38° | XS | 4 | HB | 45° | 12°

P	M	K	N	S	H
●	●		●	●	

especially for soft, tough and high-alloyed materials • 40% higher milling performance thanks to short stable design • neck clearance • special front end • consisting of art. no. 6939

Article no. **6469**

Ø-range mm	Pieces/set	Order no.	價格
6/8/10/12	4	6469 1.000	6,600

Ratio end mill sets RF 100 Sharp

Article no. **6482**

VHM | P | N | WN | 38° 40° | 4 | HA | 45° | 12°

P	M	K	N	S	H
●	●		●	●	

especially for soft, tough and high-alloyed materials • longer cutting edge than DIN 6527 L • neck clearance • centre cutting • consisting of item no. 6478

Article no. **6482**

Ø-range mm	Pieces/set	Order no.	價格
6/8/10/12/16	5	6482 1.000	12,500
6/8/10/12	4	6482 2.000	7,600

Ratio end mill sets RF 100 Sharp

Article no. **6483**

VHM | P | N | WN | 38° 40° | 4 | HB | 45° | 12°

P	M	K	N	S	H
●	●		●	●	

especially for soft, tough and high-alloyed materials • longer cutting edge than DIN 6527 L • neck clearance • centre cutting • consisting of item no. 6479

Article no. **6483**

Ø-range mm	Pieces/set	Order no.	價格
6/8/10/12/16	5	6483 1.000	12,800
6/8/10/12	4	6483 2.000	7,800

RF 100 Sharp

Milling conditions:

HPC　HPC : High Performance Cutting
stable machining conditions 穩定的機械加工條件
high drive power 主軸具有高驅動馬力

M7C　unstable machining conditions 機械與工件夾持不佳
low drive power 主軸馬力不足

long tools

long (DIN)+ tools

Correction factors:

加工深度ap大於1.5D時，切削速度Vc與每刃進給Fz必須降低25%

	v_c	f_z
a_p roughing > 1.5 x D	-25 %	-25 %
長刃型 medium length tools	-40 %	-40 %
XS 1D 短刃型 extra short tools		+40 %

Machining group	Application	v_c (m/min)	a_e max.	f_z (mm/z) with nom. Ø								
				1	3	4	6	8	10	12	16	20
P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm², 125 HB **P1.1.2** Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm², 125 HB **P1.1.3** Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm², 190 HB **P1.1.4** Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm², 190 HB **P1.1.5** Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm², 250 HB **P1.1.6** Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm², 270 HB **P1.1.7** Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm², 300 HB	Slotting	180	1xD	0.005	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120
	Roughing	205	0.75xD	0.007	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
	Finishing	360	0.02xD	0.007	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm², 180 HB **P2.1.2** Low-alloy steel, heat-treated, Rm 930 N/mm², 275 HB **P2.1.3** Low-alloy steel, heat-treated, Rm 1020 N/mm², 300 HB **P2.1.4** Low-alloy steel, heat-treated, Rm 1190 N/mm², 350 HB	Slotting	160	1xD	0.005	0.015	0.020	0.030	0.040	0.055	0.065	0.090	0.110
	Roughing	185	0.75xD	0.006	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125
	Finishing	320	0.02xD	0.006	0.018	0.025	0.035	0.050	0.060	0.075	0.095	0.120
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm², 200 HB **P3.1.2** High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm², 325 HB	Slotting	135	1xD	0.004	0.013	0.020	0.025	0.035	0.050	0.060	0.080	0.100
	Roughing	155	0.75xD	0.006	0.017	0.025	0.035	0.045	0.060	0.070	0.090	0.115
	Finishing	270	0.02xD	0.006	0.017	0.020	0.035	0.045	0.055	0.065	0.090	0.110
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives **M1.1.2** Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm², 200 HB	Slotting	120	1xD	0.004	0.013	0.020	0.025	0.035	0.050	0.060	0.080	0.100
	Roughing	140	0.75xD	0.006	0.017	0.025	0.035	0.045	0.060	0.070	0.090	0.115
	Finishing	240	0.02xD	0.006	0.017	0.020	0.035	0.045	0.055	0.065	0.090	0.110
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm², 240 HB	Slotting	90	1xD	0.004	0.012	0.015	0.025	0.030	0.045	0.055	0.070	0.090
	Roughing	100	0.75xD	0.005	0.016	0.020	0.030	0.040	0.050	0.060	0.085	0.105
	Finishing	175	0.02xD	0.005	0.015	0.020	0.030	0.040	0.050	0.060	0.080	0.100
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	Slotting	80	1xD	0.004	0.012	0.015	0.025	0.030	0.045	0.055	0.070	0.090
	Roughing	100	0.6xD	0.005	0.016	0.020	0.030	0.045	0.055	0.065	0.085	0.110
	Finishing	160	0.01xD	0.005	0.014	0.020	0.025	0.035	0.045	0.055	0.070	0.090
M2.2.1 Duplex steel, high-strength stainless steels	Slotting	60	1xD	0.003	0.010	0.015	0.020	0.030	0.040	0.045	0.065	0.080
	Roughing	75	0.6xD	0.005	0.014	0.020	0.030	0.040	0.045	0.055	0.075	0.095
	Finishing	120	0.01xD	0.004	0.012	0.015	0.025	0.030	0.040	0.045	0.065	0.080
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB **K1.1.2** Grey cast iron, pearlitic/martensitic, 260 HB **K1.2.1** Cast iron with spheroidal graphite, ferritic, 160 HB **K1.2.2** Cast iron with spheroidal graphite, pearlitic, 250 HB												
K1.3.1 Malleable cast iron, ferritic, 130 HB **K1.3.2** Malleable cast iron, pearlitic, 230 HB												
K2.1.1 Vermicular graphite cast iron (GJV) **K2.2.1** Austenitic-ferritic spheroidal graphite cast iron (ADI)												
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB **N1.1.2** Wrought aluminium alloys, hardened, 100 HB	Slotting	500	1xD	0.007	0.021	0.030	0.040	0.055	0.080	0.095	0.130	0.160
	Roughing	575	0.75xD	0.009	0.028	0.035	0.055	0.075	0.090	0.110	0.145	0.185
	Finishing	1000	0.02xD	0.009	0.026	0.035	0.055	0.070	0.090	0.105	0.140	0.175
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB **N2.1.2** Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	Slotting	230	1xD	0.005	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120
	Roughing	265	0.75xD	0.007	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
	Finishing	460	0.02xD	0.007	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	Slotting	180	1xD	0.005	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120
	Roughing	180	0.75xD	0.006	0.018	0.025	0.035	0.050	0.060	0.070	0.095	0.120
	Finishing	365	0.02xD	0.007	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130

All the values stated are guide values. You can find detailed cutting values online in our Gühring Navigator at navigator.guehring.de.

Machining group	Application	v_c (m/min)	a_e max.	f_z (mm/z) with nom. Ø								
				1	3	4	6	8	10	12	16	20
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 % **N3.1.2** Copper and copper alloys: CuZn, CuSnZn	Slotting	250	1xD	0.005	0.016	0.020	0.030	0.040	0.060	0.070	0.095	0.120
	Roughing	290	0.75xD	0.007	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
	Finishing	500	0.02xD	0.007	0.020	0.025	0.040	0.055	0.065	0.080	0.105	0.130
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	Slotting	195	1xD	0.005	0.015	0.020	0.030	0.040	0.055	0.065	0.090	0.110
	Roughing	225	0.75xD	0.006	0.019	0.025	0.040	0.050	0.065	0.075	0.100	0.125
	Finishing	390	0.02xD	0.006	0.018	0.025	0.035	0.050	0.060	0.075	0.095	0.120
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	Slotting	150	1xD	0.006	0.017	0.020	0.035	0.045	0.065	0.075	0.100	0.125
	Roughing	175	0.75xD	0.007	0.022	0.030	0.045	0.060	0.070	0.085	0.115	0.145
	Finishing	300	0.02xD	0.007	0.021	0.030	0.040	0.055	0.070	0.085	0.110	0.140
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	Slotting	200	1xD	0.005	0.015	0.020	0.030	0.040	0.055	0.065	0.090	0.110
	Roughing	230	0.75xD	0.006	0.019	0.025	0.040	0.050	0.065	0.075	0.105	0.130
	Finishing	400	0.02xD	0.006	0.019	0.025	0.035	0.050	0.060	0.075	0.100	0.125
N4.1.3 Non-metallic materials: Graphite	Slotting	240	1xD	0.007	0.021	0.030	0.040	0.055	0.080	0.095	0.130	0.160
	Roughing	275	0.75xD	0.009	0.028	0.035	0.055	0.075	0.090	0.110	0.145	0.185
	Finishing	480	0.02xD	0.009	0.026	0.035	0.055	0.070	0.090	0.105	0.140	0.175
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	Slotting	30	1xD	0.004	0.011	0.015	0.020	0.030	0.040	0.050	0.065	0.080
	Roughing	40	0.6xD	0.005	0.014	0.020	0.030	0.040	0.050	0.060	0.075	0.095
	Finishing	60	0.01xD	0.004	0.012	0.015	0.025	0.030	0.040	0.050	0.065	0.080
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	Slotting	25	1xD	0.004	0.011	0.015	0.020	0.030	0.040	0.050	0.065	0.080
	Roughing	30	0.6xD	0.005	0.014	0.020	0.030	0.040	0.050	0.060	0.075	0.095
	Finishing	50	0.01xD	0.004	0.012	0.015	0.025	0.030	0.040	0.050	0.065	0.080
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	Slotting	15	1xD	0.003	0.009	0.010	0.015	0.025	0.030	0.040	0.050	0.065
	Roughing	20	0.6xD	0.004	0.012	0.015	0.025	0.030	0.040	0.045	0.060	0.080
	Finishing	35	0.01xD	0.003	0.010	0.015	0.020	0.025	0.030	0.040	0.050	0.065
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	Slotting	15	1xD	0.003	0.008	0.010	0.015	0.020	0.030	0.035	0.050	0.060
	Roughing	15	0.6xD	0.004	0.011	0.015	0.020	0.030	0.035	0.045	0.060	0.075
	Finishing	25	0.01xD	0.003	0.009	0.010	0.020	0.025	0.030	0.035	0.050	0.060
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	Slotting	15	1xD	0.003	0.009	0.010	0.015	0.025	0.030	0.040	0.050	0.065
	Roughing	20	0.6xD	0.004	0.012	0.015	0.025	0.030	0.040	0.045	0.060	0.080
	Finishing	30	0.01xD	0.003	0.010	0.015	0.020	0.025	0.030	0.040	0.050	0.065
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm²	Slotting	70	1xD	0.004	0.013	0.020	0.025	0.035	0.050	0.060	0.080	0.100
	Roughing	90	0.6xD	0.006	0.018	0.025	0.035	0.050	0.060	0.070	0.095	0.120
	Finishing	140	0.02xD	0.006	0.017	0.020	0.035	0.045	0.055	0.065	0.090	0.110
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm²	Slotting	60	1xD	0.004	0.012	0.015	0.025	0.030	0.045	0.055	0.070	0.090
	Roughing	75	0.6xD	0.005	0.016	0.020	0.030	0.045	0.055	0.065	0.085	0.110
	Finishing	120	0.02xD	0.005	0.015	0.020	0.030	0.040	0.050	0.060	0.080	0.100
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC												
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC												
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC												
H2.1.1 Chilled cast iron, 400 HB												
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC												

All the values stated are guide values. You can find detailed cutting values online in our Gühring Navigator at navigator.guehring.de.

Solid carbide milling cutter RF 100 Sharp

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