



**GÜHRING**

## 高性能銑牙刀

- 縮短銑牙加工時間 55%
- 刀具壽命提升 17%
- 高品質螺紋面粗度
- 降低徑向切削負荷
- 降低刀具頂出震刀

**SC-TM-Z SP**

High-performance thread milling cutter with full profile



## SC-Line thread milling cutter SC-TM-Z SP

# Thread milling at the limits

Economical & process-reliable  
thread milling up to 2.5xD  
thread depth

The high-performance full-profile thread milling cutter  
produces the complete thread in two revolutions.

這款高性能全輪廓螺紋銑刀只需旋轉兩圈即可完成螺紋加工。

Thanks to its new flute geometry, vibrations are successfully suppressed, which enables higher cutting parameters to be achieved. Users benefit from significantly shorter machining times and high thread quality. Thanks to its outstanding wear resistance, the thread milling cutter can produce true-to-gauge for longer. Tool radius correction therefore is not needed until much later on.

全新的刀槽幾何形狀，振動得到有效抑制，從而能夠實現更高的切削參數。使用者可顯著縮短加工時間並獲得高品質的螺紋，憑藉其卓越的耐磨性，該螺紋銑刀能夠長時間保持螺紋的精確度，因此，刀具半徑補正的需求可以大大降低。

減少 55% 銑牙加工時間 / 刀具壽命提升 17%

x 55 % reduction in **machining time** per thread

x **Tool life** increased by 17 %

- X** Excellent running smoothness and surface quality thanks to patent-pending flute geometry  
 特殊刀槽幾何形狀設計，加工穩定、高品質的牙表面，專利申請中
- X** New milling strategy & short machining time reduce cost per thread  
 全新的銑削策略、更短的加工時間、降低螺紋加工成本
- X** High process reliability with maximum tool life up to 2.5xD thread depth  
 加工製程高可靠穩定性，提高了刀具壽命，螺紋深度最多 2.5 倍螺紋直徑
- X** Reduced radial load  
 徑向負荷降低、刀具頂出震刀降低



**New flute geometry with uneven division**  
and uneven spiralling suppresses vibrations

新的溝槽幾何採用不等分割及不等螺旋，降低切削時的震動產生

**Irregular tooth rows** reduce radial forces  
and improve dimensional accuracy and process reliability

不規則的齒排列方式設計，降低了切削時的徑向力，提高尺寸精度和製程可靠性。

Optimum combination of **carbide, Sirius coating**  
and **tool geometry** ensures maximum wear resistance

鎢鋼硬質合金、Sirius塗層和刀具幾何形狀的最佳組合，確保了最大的耐磨性

## Application example 加工應用實例

**Component:** Bearing block St-52, 1,0570, thread depth 20 mm

**Tool:** #4870, M10x(1.5) 2.5xD with internal cooling

**Customer target:** Machining times reduced at thread depth of max. 2.5xD

**Difficulty:** Increased cost-effectiveness compared to competitors' tools

Cutting data:	Gühring	Competitor
$v_c$	120 m/min	110 m/min
$f_z$	0.075 mm/z	0.055 mm/z
<b>Counter rotation</b>	2/3-1/3	<b>Counter rotation</b> 2/3-1/3

**Tool life:** 820 parts (Gühring) vs 700 parts (Competitor)



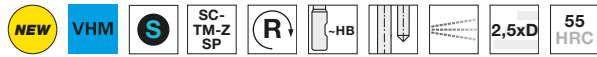
Thread milling cutters without chamfer for ISO metric threads

Article no. **4870**



提供専用CNC程式

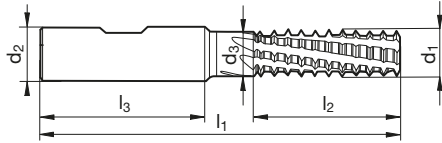
cutting data see page 5



maximum performance • unequal flute spacing • unequal helix

P	M	K	N	S	H
•	•	•	•	•	○

H = 55 HRC



Standard  
Article no.

**Company std.**

**4870**

Thread milling cutters

D	P mm	d1 mm	d2 mm	d3 mm	dk mm	l1 mm	l3 mm	l2 mm	Z
M3	0.500	2.30	6.00	2.30	2.50	54.00	36.00	7.50	4
M4	0.700	3.10	6.00	3.10	3.30	58.00	36.00	10.50	4
M5	0.800	4.00	6.00	4.00	4.20	58.00	36.00	12.80	4
M6	1.000	4.80	6.00	4.80	5.00	58.00	36.00	16.00	4
M8	1.250	6.30	8.00	6.30	6.80	68.00	36.00	21.25	4
M8 x 1	1.000	6.30	8.00	6.30	7.00	68.00	36.00	21.00	4
M10	1.500	8.00	10.00	8.00	8.50	74.00	40.00	25.50	4
M10 x 1	1.000	8.00	10.00	8.00	9.00	74.00	40.00	25.00	4
M10 x 1,25	1.250	8.00	10.00	8.00	8.80	74.00	40.00	26.25	4
M12	1.750	9.95	12.00	9.95	10.20	90.00	45.00	33.25	4
M12 x 1	1.000	9.95	12.00	9.95	11.00	90.00	45.00	31.00	4
M12 x 1,5	1.500	9.95	12.00	9.95	10.50	90.00	45.00	31.50	4
M14	2.000	11.20	12.00	11.20	12.00	100.00	45.00	38.00	6
M14 x 1,5	1.500	11.20	12.00	11.20	12.50	100.00	45.00	37.50	6
M16	2.000	13.10	16.00	13.10	14.00	105.00	48.00	42.00	6
M16 x 1,5	1.500	13.10	16.00	13.10	14.50	105.00	48.00	40.50	6
M20	2.500	14.95	16.00	14.95	17.50	120.00	48.00	52.50	6
M20 x 1,5	1.500	14.95	16.00	14.95	18.50	120.00	48.00	49.50	6

Order no.	價格
4870 3.000	8,200
4870 4.000	8,400
4870 5.000	9,000
4870 6.000	9,800
4870 8.000	10,700
4870 8.005	11,100
4870 10.000	12,800
4870 10.005	13,800
4870 10.006	14,000
4870 12.000	15,500
4870 12.005	16,700
4870 12.007	16,600
4870 14.000	17,500
4870 14.007	17,300
4870 16.000	19,600
4870 16.007	20,700
4870 20.000	23,200
4870 20.007	23,800



SC-Line Thread milling cutters, SC-TM-Z SP



Cutting data

Machining group		fz (mm/z) with milling part-0 (d1)									
		v <sub>c</sub> (m/min)	3	4	5	6	8	10	12	14	16
	P1.1.1 Unalloyed steel, annealed, 0.15 % C, Rm 420 N/mm <sup>2</sup> , 125 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120
P1.1.2 Unalloyed steel, heat-treated, 0.15 % C, Rm 420 N/mm <sup>2</sup> , 125 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.3 Unalloyed steel, annealed, 0.45 % C, Rm 640 N/mm <sup>2</sup> , 190 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.4 Unalloyed steel, heat-treated, 0.45 % C, Rm 640 N/mm <sup>2</sup> , 190 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.5 Unalloyed steel, heat-treated, 0.45 % C, Rm 850 N/mm <sup>2</sup> , 250 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.6 Unalloyed steel, annealed, 0.75 % C, Rm 915 N/mm <sup>2</sup> , 270 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P1.1.7 Unalloyed steel, heat-treated, 0.75 % C, Rm 1020 N/mm <sup>2</sup> , 300 HB	120	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P2.1.1 Low-alloy steel, annealed, Rm 610 N/mm <sup>2</sup> , 180 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P2.1.2 Low-alloy steel, heat-treated, Rm 930 N/mm <sup>2</sup> , 275 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P2.1.3 Low-alloy steel, heat-treated, Rm 1020 N/mm <sup>2</sup> , 300 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P2.1.4 Low-alloy steel, heat-treated, Rm 1190 N/mm <sup>2</sup> , 350 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
P3.1.1 High-alloy steel and tool steel, annealed, Rm 680 N/mm <sup>2</sup> , 200 HB	90	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
P3.1.2 High-alloy steel and tool steel, hardened and tempered, Rm 1100 N/mm <sup>2</sup> , 325 HB	90	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
M1.1.1 Stainless steel, ferritic/martensitic, with machining additives	80	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
M1.1.2 Stainless steel, ferritic/martensitic, annealed, Rm 680 N/mm <sup>2</sup> , 200 HB	80	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
M1.1.3 Stainless steel, ferritic/martensitic, heat-treated, Rm 810 N/mm <sup>2</sup> , 240 HB	80	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
M2.1.1 Stainless steel, austenitic, quenched, 180 HB	55	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
M2.2.1 Duplex steel, high-strength stainless steels	50	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
K1.1.1 Grey cast iron, pearlitic/ferritic, 180 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.1.2 Grey cast iron, pearlitic/martensitic, 260 HB	110	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.2.1 Cast iron with spheroidal graphite, ferritic, 160 HB	90	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.2.2 Cast iron with spheroidal graphite, pearlitic, 250 HB	90	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.3.1 Malleable cast iron, ferritic, 130 HB	90	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K1.3.2 Malleable cast iron, pearlitic, 230 HB	90	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
K2.1.1 Vermicular graphite cast iron (GJV)	100	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
K2.2.1 Austenitic-ferritic spheroidal graphite cast iron (ADI)	100	0.035	0.040	0.045	0.050	0.060	0.070	0.080	0.085	0.095	0.105
N1.1.1 Wrought aluminium alloys, non-hardened, 60 HB	180	0.055	0.065	0.075	0.080	0.095	0.110	0.120	0.135	0.145	0.165
N1.1.2 Wrought aluminium alloys, hardened, 100 HB	180	0.055	0.065	0.075	0.080	0.095	0.110	0.120	0.135	0.145	0.165
N2.1.1 Aluminium casting alloys, non-hardened, ≤ 12 % Si, 75 HB	160	0.050	0.060	0.065	0.075	0.090	0.100	0.110	0.120	0.130	0.150
N2.1.2 Aluminium casting alloys, hardened, ≤ 12 % Si, 90 HB	160	0.050	0.060	0.065	0.075	0.090	0.100	0.110	0.120	0.130	0.150
N2.1.3 Aluminium casting alloys, non-hardened, > 12 % Si, 130 HB	160	0.050	0.060	0.065	0.075	0.090	0.100	0.110	0.120	0.130	0.150
N3.1.1 Copper and copper alloys: Free-machining alloy, Pb > 1 %	140	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
N3.1.2 Copper and copper alloys: CuZn, CuSnZn	140	0.045	0.055	0.060	0.065	0.080	0.090	0.100	0.110	0.120	0.135
N3.1.3 Copper and copper alloys: CuSn, lead-free copper and copper electrolyte	110	0.040	0.045	0.050	0.055	0.065	0.075	0.085	0.095	0.100	0.115
N4.1.1 Non-metallic materials: Duroplastics, fibre-reinforced plastics	200	0.040	0.045	0.055	0.060	0.070	0.080	0.090	0.100	0.105	0.120
N4.1.2 Non-metallic materials: Hard rubber, wood, etc.	200	0.040	0.045	0.055	0.060	0.070	0.080	0.090	0.100	0.105	0.120
N4.1.3 Non-metallic materials: Graphite	200	0.040	0.045	0.055	0.060	0.070	0.080	0.090	0.100	0.105	0.120
S1.1.1 Heat-resistant alloys, Fe-based, annealed, 200 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S1.1.2 Heat-resistant alloys, Fe-based, hardened, 280 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S1.1.3 Heat-resistant alloys, Ni- or Co-based, annealed, 250 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S1.1.4 Heat-resistant alloys, Ni- or Co-based, hardened, 350 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S1.1.5 Heat-resistant alloys, Ni- or Co-based, cast, 320 HB	60	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S2.1.1 Titanium alloys, pure titanium, Rm 400 N/mm <sup>2</sup>	45	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
S2.1.2 Titanium alloys, Alpha and Beta alloys, hardened, Rm 1050 N/mm <sup>2</sup>	45	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
H1.1.1 Hardened steel, hardened and tempered, < 55 HRC	40	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
H1.1.2 Hardened steel, hardened and tempered, < 60 HRC	40	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
H1.1.3 Hardened steel, hardened and tempered, > 60 HRC	40	0.025	0.030	0.035	0.035	0.045	0.050	0.055	0.060	0.065	0.075
H2.1.1 Chilled cast iron, 400 HB											
H2.1.2 Chilled cast iron, hardened and tempered, < 55 HRC											