H680 Series for high precision milling (Hardened steel HRC 40~68)

- Ultra grain carbide rods with better abrasion resistance.
- Use SICO-TH coating with anti-high temperature & anti-oxidation.
- Special geometry design, suitable for high hardened working materials.
- Comparable to Europe, America, Japan's tolerance with high precision and high performance on Finishing working situation.
- Long Tool life tools reduce tool costs and working cost effectively.

Features

- **High Precision**
- **High Speed**
- **High Hardness**

Index

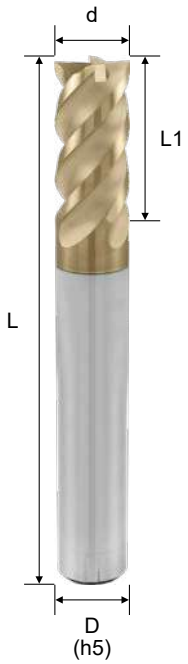
Appearance	Series	Code No.		Num. of Teet	Helix Ang	Coating	Working Materials P	M	K	N	S	H	Page
H680 Series *for high precision milling (Hardened steel HRC 40~68)*													
	High Precision · Square · 4F	EHSSF	Ø1~Ø12	4	45°	SICO-TH	●	○	●		○	●	A017
	High Precision · Long Shank · Square · 4F	EHSLF	Ø4~Ø16	4	45°	SICO-TH	●	○	●		○	●	A018
	High Precision · Ball Nose · 2F	EHBSF	0.5R~6R	2	30°	SICO-TH	●	○	●		○	●	A019
	High Precision · Long Shank · Ball Nose · 2F	EHBLF	2R~6R	2	30°	SICO-TH	●	○	●		○	●	A020
H680 Pro 	High Precision · Short with Neck · Ball Nose · 2F	EHBUF	0.5R~6R	2	30°	SICO Pro	●	○	●		○	●	A021
	High Precision · Corner Radius · 4F	EHCSF	Ø1~Ø12	4	30°	SICO-TH	●	○	●		○	●	A022
	High Precision · Long Shank · Corner Radius · 4F	EHCLF	Ø4~Ø12	4	30°	SICO-TH	●	○	●		○	●	A023

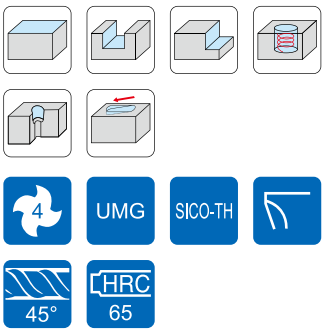
H680 - High Precision · Square · 4F

- SICO-TH Nano coating provides a superior wear and heat resistance.
- Suitable for HRC 50 and over HRC 50 Hardened Steel, also maximum up to HRC 65.
- Ultra grain carbide rods with better abrasion resistance.
- Special geometry design, suitable for high hardened working materials.

EHSSF

P	M	K	N	S	H
●	○	●		○	●





d Tolerance	
d ≤ 6	0 ~ -0.01
d > 6	0 ~ -0.02

Order No.	Dia. (d)	CL (L1)	OAL (L)	Shank (D)	Flutes (F)
* EHSSF441000S	1.0	3	50	4	4
* EHSSF441500S	1.5	4	50	4	4
* EHSSF442000S	2.0	5	50	4	4
* EHSSF442500S	2.5	6	50	4	4
EHSSF403000S	3.0	8	50	6	4
EHSSF404000S	4.0	10	50	6	4
EHSSF405000S	5.0	13	50	6	4
EHSSF406000S	6.0	15	50	6	4
EHSSF408000S	8.0	20	60	8	4
EHSSF410000S	10.0	25	75	10	4
EHSSF412000S	12.0	30	75	12	4

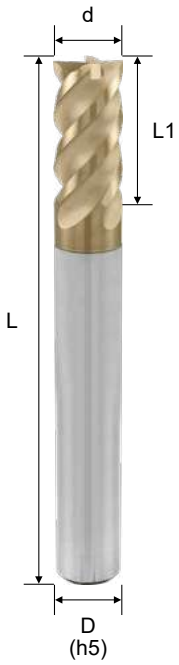
Cutting conditions：Table 006

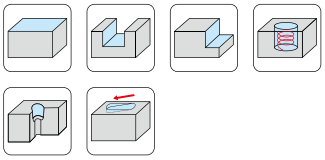
H680 - High Precision · Long Shank · Square · 4F

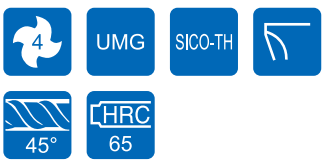
- SICO-TH Nano coating provides a superior wear and heat resistance.
- Suitable for HRC 50 and over HRC 50 Hardened Steel, also maximum up to HRC 65.
- Ultra grain carbide rods with better abrasion resistance.
- Special geometry design, suitable for high hardened working materials.

EHSLF

P	M	K	N	S	H
●	○	●		○	●







d Tolerance	
d ≤ 6	0 ~ -0.02
d > 6	0 ~ -0.03

Order No.	Dia. (d)	CL (L1)	OAL (L)	Shank (D)	Flutes (F)
Helix angle : 45°					
* EHSLF404007S	4	10	75	6	4
* EHSLF406007S	6	15	75	6	4
* EHSLF406010S	6	15	100	6	4
* EHSLF408007S	8	20	75	8	4
* EHSLF408010S	8	20	100	8	4
* EHSLF410010S	10	25	100	10	4
* EHSLF412010S	12	30	100	12	4
Helix angle : 50°					
EHSMF606000S	6	15	50	6	6
EHSMF608000S	8	20	60	8	6
EHSMF610000S	10	25	75	10	6
EHSMF612000S	12	30	75	12	6
EHSMF816000S	16	40	100	16	8

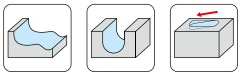
Cutting conditions : Table 006

H680 - High Precision · Ball Nose · 2F

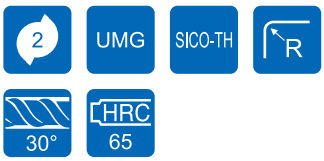
- SICO-TH Nano coating provides a superior wear and heat resistance.
- Suitable for HRC 50 and over HRC 50 Hardened Steel, also maximum up to HRC 65.
- Ultra grain carbide rods with better abrasion resistance.
- R tolerance ±5μm with high precision and high performance on Finishing working situation.
- Special geometry design, suitable for high hardened working materials.

EHBSF

P	M	K	N	S	H
●	○	●		○	●



Order No.	Radius (R)	Dia. (d)	CL (L1)	OAL (L)	Shank (D)	Flutes (F)
* EHBSF241000S	0.5R	1	2	50	4	2
* EHBSF242000S	1.0R	2	4	50	4	2
* EHBSF244000S	2.0R	4	8	50	4	2
EHBSF203000S	1.5R	3	6	50	6	2
EHBSF204000S	2.0R	4	8	50	6	2
EHBSF206000S	3.0R	6	12	50	6	2
EHBSF208000S	4.0R	8	16	60	8	2
EHBSF210000S	5.0R	10	20	75	10	2
EHBSF212000S	6.0R	12	24	75	12	2



R Tolerance	
R ≤ 3	±0.005
R > 3	±0.007

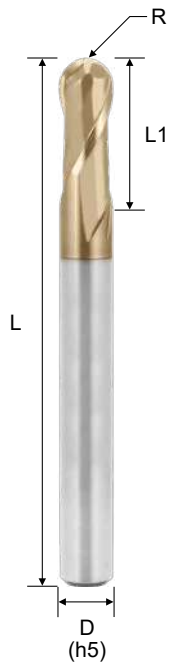
Cutting conditions：Table 007

H680 - High Precision · Long Shank · Ball Nose · 2F

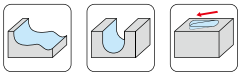
- SICO-TH Nano coating provides a superior wear and heat resistance.
- Suitable for HRC 50 and over HRC 50 Hardened Steel, also maximum up to HRC 65.
- Ultra grain carbide rods with better abrasion resistance.
- R tolerance ±5μm with high precision and high performance on Finishing working situation.
- Special geometry design, suitable for high hardened working materials.

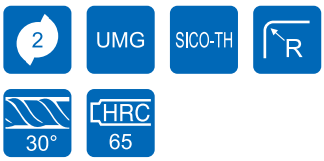
EHBLF

P	M	K	N	S	H
●	○	●		○	●



Order No.	Radius (R)	Dia. (d)	CL (L1)	OAL (L)	Shank (D)	Flutes (F)
* EHBLF204007S	2R	4	8	75	6	2
* EHBLF206007S	3R	6	12	75	6	2
* EHBLF206010S	3R	6	12	100	6	2
* EHBLF208007S	4R	8	16	75	8	2
* EHBLF208010S	4R	8	16	100	8	2
* EHBLF210010S	5R	10	20	100	10	2
* EHBLF212010S	6R	12	24	100	12	2





R Tolerance	
R ≤ 3	±0.007
R > 3	±0.010

Cutting conditions：Table 007

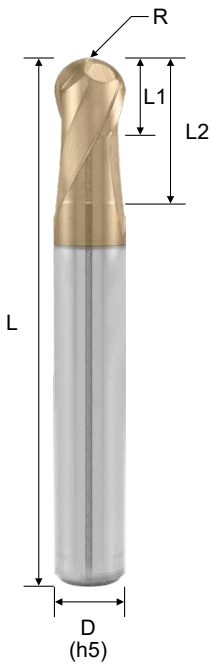
H680 Pro - High Precision · Short with Neck · Ball Nose · 2F

- SICO Pro coating improve heat and oxidation resistance.
- Special SR geometry design with wear resistance, good chip discharge and high rigidity.
- For hardened materials milling from HRC 40 to HRC 60.
- High-efficiency for roughing and high feed finishing.
- SICO Pro coating includes Al, Ti, Si, N elements.

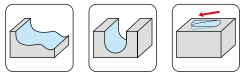
H680 Pro

EHBUF

P	M	K	N	S	H
●	○	●		○	●



Order No.	Radius (R)	Dia. (d)	CL (L1)	EFF-L (L2)	OAL (L)	Shank (D)	Flutes (F)
NEW EHBUF240200PS	0.10R	0.2	0.2	0.2	50	4	2
NEW EHBUF240400PS	0.20R	0.4	0.4	0.4	50	4	2
NEW EHBUF240600PS	0.30R	0.6	0.6	0.6	50	4	2
NEW EHBUF240800PS	0.40R	0.8	0.8	0.8	50	4	2
NEW EHBUF241000PS	0.50R	1.0	1.0	1.0	50	4	2
NEW EHBUF241500PS	0.75R	1.5	1.5	1.5	50	4	2
NEW EHBUF242000PS	1.00R	2.0	2.0	2.0	50	4	2
NEW EHBUF202000PS	1.00R	2.0	2.0	2.0	50	6	2
NEW EHBUF243000PS	1.50R	3.0	3.0	3.0	50	4	2
NEW EHBUF203000PS	1.50R	3.0	3.0	3.0	50	6	2
NEW EHBUF244000PS	2.00R	4.0	4.0	4.0	50	4	2
NEW EHBUF204000PS	2.00R	4.0	4.0	4.0	50	6	2
* EHBUF241001PS	0.50R	1.0	1.0	2	50	4	2
* EHBUF241501PS	0.75R	1.5	1.5	3	50	4	2
* EHBUF242001PS	1.00R	2.0	2.0	4	50	4	2
* EHBUF243001PS	1.50R	3.0	3.0	6	50	4	2
* EHBUF244001PS	2.00R	4.0	4.0	8	50	4	2
* EHBUF206001PS	3.00R	6.0	6.0	12	50	6	2
* EHBUF208001PS	4.00R	8.0	8.0	16	60	8	2
* EHBUF210001PS	5.00R	10.0	10.0	20	75	10	2
* EHBUF212001PS	6.00R	12.0	12.0	24	75	12	2



2 | UMG | SICO-TH | R

30° | HRC 65

R Tolerance	
R ≤ 3	±0.005
R > 3	±0.007

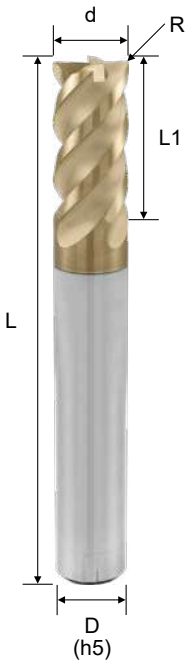
Cutting conditions：Table 007

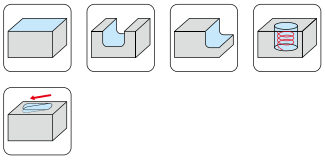
H680 - High Precision · Corner Radius · 4F

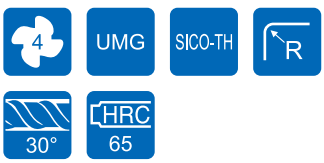
- SICO-TH Nano coating provides a superior wear and heat resistance.
- Suitable for HRC 50 and over HRC 50 Hardened Steel, also maximum up to HRC 65.
- Ultra grain carbide rods with better abrasion resistance.
- Special geometry design, suitable for high hardened working materials.

EHCSF

P	M	K	N	S	H
●	○	●		○	●







d Tolerance	
d ≤ 6	0 ~ -0.01
d > 6	0 ~ -0.02

R Tolerance	
R < 2	±0.010
R ≥ 2	±0.015

Order No.	Dia. (d)	Corner Radius (R)	CL (L1)	OAL (L)	Shank (D)	Flutes (F)
* EHCSF441001S	1.0	0.1R	2	50	4	4
* EHCSF441002S	1.0	0.2R	2	50	4	4
* EHCSF441501S	1.5	0.1R	3	50	4	4
* EHCSF441502S	1.5	0.2R	3	50	4	4
* EHCSF442001S	2.0	0.1R	4	50	4	4
* EHCSF442002S	2.0	0.2R	4	50	4	4
* EHCSF442005S	2.0	0.5R	4	50	4	4
* EHCSF443002S	3.0	0.2R	6	50	4	4
* EHCSF443005S	3.0	0.5R	6	50	4	4
EHCSF403005S	3.0	0.5R	6	50	6	4
* EHCSF444002S	4.0	0.2R	8	50	4	4
* EHCSF444005S	4.0	0.5R	8	50	4	4
EHCSF404005S	4.0	0.5R	8	50	6	4
EHCSF404010S	4.0	1.0R	8	50	6	4
EHCSF406005S	6.0	0.5R	12	50	6	4
EHCSF406010S	6.0	1.0R	12	50	6	4
EHCSF406002S	6.0	0.2R	12	50	6	4
EHCSF406003S	6.0	0.3R	12	50	6	4
EHCSF408005S	8.0	0.5R	16	60	8	4
EHCSF408010S	8.0	1.0R	16	60	8	4
EHCSF410005S	10.0	0.5R	20	75	10	4
EHCSF410010S	10.0	1.0R	20	75	10	4
EHCSF412005S	12.0	0.5R	24	75	12	4
EHCSF412010S	12.0	1.0R	24	75	12	4

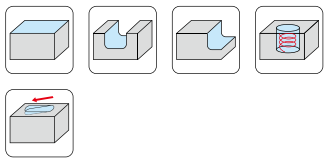
Cutting conditions : Table 006

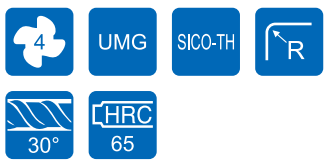
H680 - High Precision · Long Shank · Corner Radius · 4F

- SICO-TH Nano coating provides a superior wear and heat resistance.
- Suitable for HRC 50 and over HRC 50 Hardened Steel, also maximum up to HRC 65.
- Ultra grain carbide rods with better abrasion resistance.
- Special geometry design, suitable for high hardened working materials.

EHCLF

P	M	K	N	S	H
●	○	●		○	●





Order No.	Dia. (d)	Corner Radius (R)	CL (L1)	OAL (L)	Shank (D)	Flutes (F)
* EHCLF40400507S	4	0.5R	8	75	6	4
* EHCLF40600507S	6	0.5R	12	75	6	4
* EHCLF40600510S	6	0.5R	12	100	6	4
* EHCLF40800507S	8	0.5R	16	75	8	4
* EHCLF40800510S	8	0.5R	16	100	8	4
* EHCLF41000510S	10	0.5R	20	100	10	4
* EHCLF41200510S	12	0.5R	24	100	12	4

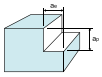
Cutting conditions：Table 006

d Tolerance	
d ≤ 6	0 ~ -0.02
d > 6	0 ~ -0.03

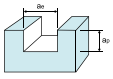
R Tolerance	
R < 2	±0.015
R ≥ 2	±0.020

Table 006

H680 Seires EHSSF4, EHSLF4, EHCSF4, EHCLF4

Side Milling 

Work Material	Condition Range	Cutting Depth	Cutting Condition	Diameter (d)							
				Ø1	Ø2	Ø3	Ø4	Ø6	Ø8	Ø10	Ø12
Pre-Harden Steels (HRC 35~45) NAK80,CENA1	High Speed	ap=1.5D	RPM	35000	17500	12000	8700	5830	4380	3500	2900
		ae=0.05D	Feed(mm/min)	630	830	1000	1000	1100	1100	1100	1100
	General	ap=1.5D	RPM	25500	12700	8500	6350	4200	3200	2500	2150
		ae=0.07D	Feed(mm/min)	460	510	550	600	750	800	750	700
Hardened Steels (HRC 45~60) SKD61,SKD11,SKH51	High Speed	ap=1.5D	RPM	32000	16000	11000	8000	5300	4000	3200	2750
		ae=0.02D	Feed(mm/min)	600	750	800	850	900	1000	900	850
	General	ap=1.5D	RPM	22000	11200	7400	5600	3750	2800	2200	2000
		ae=0.05D	Feed(mm/min)	360	440	460	500	560	600	580	550

Slotting Milling 

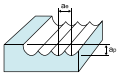
Work Material	Condition Range	Cutting Depth	Cutting Condition	Diameter (d)						
				Ø3	Ø4	Ø5	Ø6	Ø8	Ø10	Ø12
Pre-Harden Steels (HRC 35~45) NAK80,CENA1	General	ap=0.5D	RPM	7690	5800	4640	3770	2900	2320	1890
		ae=1D	Feed(mm/min)	460	580	670	610	580	550	520
Hardened Steels (HRC 45~60) SKD61,SKD11,SKH51	General	ap=0.2D	RPM	3990	3000	2430	1950	1500	1200	1020
		ae=1D	Feed(mm/min)	200	240	300	330	300	270	240

1.Use as highly rigid and accurate machine as possible.
2.If the rpm available is lower than the recommend condition, please reduce the feed rate to the same ratio.
3.Use long shank type please reduce the rpm and feed rate.
4.The Feed and RPM may be changed depending on the M/C conditions ,lubricating and cooling system.

Recommended Cutting Conditions

Table 007

H680 Seires EHBSF2, EHBLF2, EHBUF2



Work Material	Condition Range	Cutting Depth	Cutting Condition	Radius						
				0.5R	1R	2R	3R	4R	5R	6R
Pre-Harden Steels (HRC 35~45) NAK80,CENA1	High Speed	ap=0.05~0.1	RPM	50000	32000	22000	16000	12000	10000	8000
		ae=0.02D	Feed(mm/min)	4000	3000	2850	2800	2400	2000	1600
	General	ap=0.05~0.1	RPM	36000	20000	13000	8500	6400	5000	4200
		ae=0.02D	Feed(mm/min)	1600	1500	1500	1400	1200	1060	920
Hardened Steels (HRC 45~55) SKD61,SKT4	High Speed	ap=0.05~0.1	RPM	50000	32000	20000	13000	10000	8000	6600
		ae=0.02D	Feed(mm/min)	3200	2560	2500	2200	1840	1600	1400
	General	ap=0.05~0.1	RPM	36000	20000	10000	6800	5200	4000	3500
		ae=0.02D	Feed(mm/min)	1280	1280	1280	1160	960	820	730
Hardened Steels (HRC 55~60) SKD11,SKH51	High Speed	ap=0.05~0.1	RPM	50000	32000	16000	11000	8000	6400	5300
		ae=0.15D	Feed(mm/min)	2000	2000	1920	1760	1400	1200	1060
	General	ap=0.05~0.1	RPM	25000	15000	9500	6500	4800	3800	3200
		ae=0.15D	Feed(mm/min)	1000	1000	960	960	840	720	640

1.Use as highly rigid and accurate machine as possible.
2.If the rpm available is lower than the recommend condition, please reduce the feed rate to the same ratio.
3.Use long shank type please reduce the rpm and feed rate.
4.The Feed and RPM may be changed depending on the M/C conditions ,lubricating and cooling system.