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HUANA TOOLS
ACHIEVE OPTIMUM TOOL LIFE

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HUANA TOOLS
华纳工具

华纳工具，切削专家
HUANATOOLS
SLOTTING& MILLING EXPERT

DIN STANDARD END MILL

张家港保税区华纳工具有限公司
ZHANGJIAGANG BONDED ZONE HUANATOOLS CO., LTD.

End mill working condition calculation method

Cutting speed (line speed)

Calculation VC
The distance of 1 points on the circumferential surface of a vertical milling cutter moving in every minute can be obtained by the following formula

$$V=\frac{\pi \times D \times N}{1000}$$

V=Cutting speed(m/min)
π=3.14
D=Diameter L(mm)
N=Rotating speed(mm^{-1})

Rotation speed

Calculation of Rotation speed
The rotation number of the mechanical spindle of a vertical milling cutter in every minute can be obtained by the following formula

$$N=\frac{1000 \times V}{\pi \times D}$$

N=Rotating speed(mm^{-1})
V=Cutting speed(m/min)
π=3.14
D=Diameter L(mm)

Feed rate

Calculation of feed rate
The feed rate of the worktable in every minute can be obtained by the following formula

$$F= N \times Z \times F$$

F=Feed rate(mm/min)
N=Rotating speed(mm^{-1})
Z=Number of flute
f=Feed rate of the flute(mm/1blade)

Feed for teeth

Calculation of the Feed of teeth
The distance of 1 points on the circumferential surface of a vertical milling cutter moving in every minute can be obtained by the following formula

$$f=\frac{F}{N \times Z}$$

f=Feed rate of the flute(mm/1blade)
F=Feed rate(mm/min)
N=Rotating speed(mm^{-1})
Z=Number of flute

Working time

Calculation of the Working time
The time required to cut the material of a workpiece can be obtained by the following formula

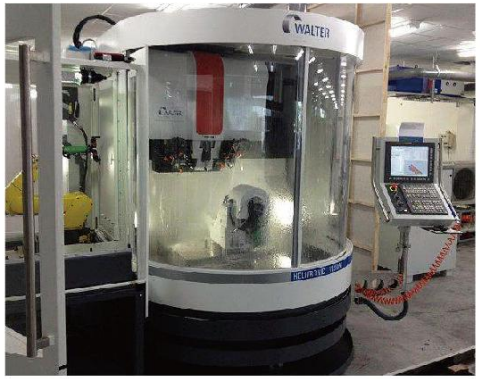
$$Tc=\frac{L}{F}$$

Tc=Working time (min)
L=Total working length
(length of working material + D of vertical milling cutter blade)
F=Feed rate(mm/min)

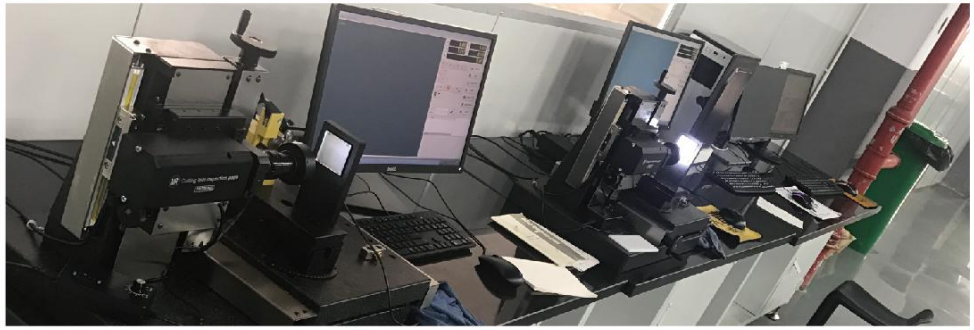
Failure analyzed and solvent

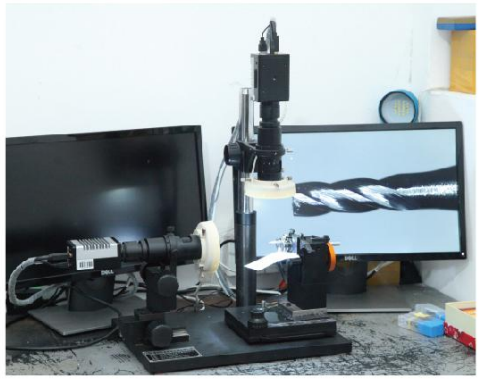
Item	Fault	Reason	Solution
Precision of cutting surface	Rough surface	Vibration	▲ Fix the working material as well as posible ▲ Adjust the failed part of machine ▲ Reduce rotating speed ▲ Downcut ▲ Tools minimum lenght out of fixture
		The heterogeneity in hardness	▲ Measuring the hardness of working material
		The tip was unsuitable	▲ Tool rake angle and clearance angle ▲ Improve cutting roughness
		Chip lump and fuse attach material	▲ Remove chip lump and clearance angle ▲ Improve cutting roughness
		Passivation of cutting edge	▲ Determine the adequate time to regrinding
		Cutting rate(speed)too fast	▲ Reduce the cutting rate(speed)
		Misfit cutting fluids or deficient of cutting fluids	▲ Change cutting fluids
	Bucking cracking of the of machined surface	Unbalance friction of cutting edge	▲ Regrinding ro reduce friction
		Fuse attach material on the cutting edge	▲ Remove fuse attach material ▲ Change cutting fluids
		Cutting edge deformation	▲ To pay attention to use and safekeeping
	The corrugation of machined surface	Lesser cutting flute	▲ Increase the number of flutes from 2 flues to 4 flutes and then 6 flutes
		Bigger cutting depth and feed rate	▲ To reduce the feed rate of machine
		A large helix angle	▲ Decrease the helix angle
Shape precision	Perpendicularitr	Cutting depth and feed rate is too large	▲ Reduce the depth of cutting and feed rate
		Tool stretches out over longer	▲ Use the end mill stretches out shaortest from chuck
		Perpendicularity of holder not resch	▲ Improve the perpendicularity of holder
End mill life	Shorter life for regrinding end mill	Work material hardness too high	▲ Improve to suitable hardness by heat treatment process ▲ Reduce the feed rate for high hardness work material or change more hardness tool
		Unsuitable feed rate	▲ Adjust to suitable feed rate
		Chip lumo and fuse attach material	▲ Remove chip lump and fuse attach material ▲ Use suitable cutting liquid
		Unsuitable cutting liquid	▲ Use suitable cutting liquid ▲ Use enough cutting liquid
	Huge friction of cutting edge	The fault of work material	▲ Uchieve the average of inside form of work material ▲ Clear up unbalance hardness
		Unsuitable edge angle	▲ Regrind to suitable angle
		End mill cutting function go down	▲ Surface treatment
		Unsuitable cutting liquid	▲ Adjust to suitable cutting liquid ▲ Adjust offer method of liquid
		Unsuitable regrind schedule	▲ Manage the regrind schedule
	Flute damage	Vibration	▲ Strengthen the install tool of work material
		The fault of work material	▲ Achieve the average of working material structure ▲ Use suitable hardness,clear up unbalance hardness ▲ Check the material may mix other hardness substance or gravel
		Unsuitable feed rate	▲ Reduce the feed rate
		Cutter become dull	▲ Regrind the tools
		Cutting liquid go off	▲ Change the cutting liquid
	Break	Work material unsuitable fixed	▲ Indeed fix the work material ▲ Improve install tool
		Cutter become dull	▲ Regrind process
		End mill with uncorrect operation	▲ Be careful of keep and operate
		Chip jam	▲ Use cutting liquid in large,during dry milling use air blow to remove chips

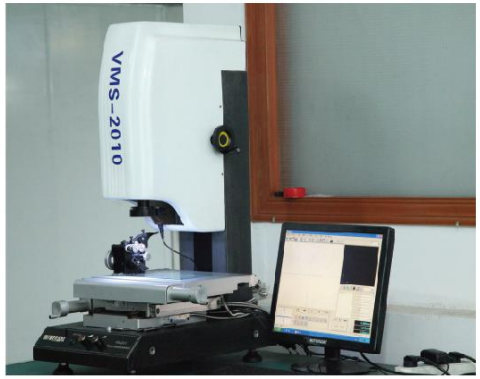
加工设备展示
PROCESSING EQUIPMENT DISPLAY

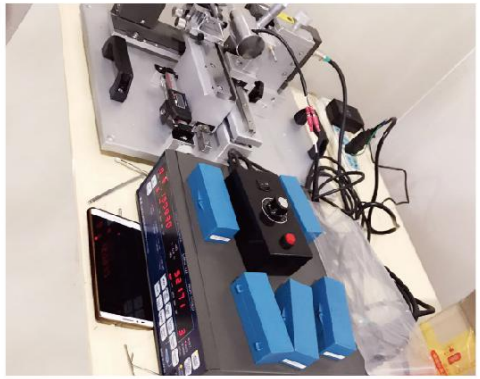


检测设备展示
DETECTION EQUIPMENT DISPLAY









HN-55 Carbide Square End Mill 4Flutes

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

4 flute

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	12	56	6	D6539
5	15	63	6	D6539
6	18	63	6	D6537K
6	20	67	6	D6537L/D6539
6	24	83	6	D6537L
8	24	80	8	D6537K/D6539
8	30	92	8	D6537L
10	30	90	10	D6537K/D6539
10	40	104	10	D6537L
12	36	103	12	D6537K/D6539
12	45	119	12	D6537L
14	45	108	14	D6537K/D6539
14	50	125	14	D6537L
16	45	116	16	D6537K/D6539
16	60	134	16	D6537L
18	45	124	18	D6537K/D6539
18	60	144	18	D6537L
20	50	132	20	D6537K/D6539
20	60	154	20	D6537L

HN-55 Carbide Aluminum End Mill 3Flutes

3 flute

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	12	56	6	D6539
5	15	63	6	D6539
6	18	63	6	D6537K
6	20	67	6	D6537L/D6539
6	24	83	6	D6537L
8	24	80	8	D6537K/D6539
8	30	92	8	D6537L
10	30	90	10	D6537K/D6539
10	40	104	10	D6537L
12	36	103	12	D6537K/D6539
12	45	119	12	D6537L
14	45	108	14	D6537K/D6539
14	50	125	14	D6537L
16	45	116	16	D6537K/D6539
16	60	134	16	D6537L
18	45	124	18	D6537K/D6539
18	60	144	18	D6537L
20	50	132	20	D6537K/D6539
20	60	154	20	D6537L

HN-55 Carbide Ball Nose End Mill 2Flutes

2 flute

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	8	56	6	D6539
5	10	63	6	D6539
6	12	63	6	D6537K
6	12	67	6	D6537L/D6539
6	12	83	6	D6537L
8	16	80	8	D6537K/D6539
8	16	92	8	D6537L
10	20	90	10	D6537K/D6539
10	20	104	10	D6537L
12	24	103	12	D6537K/D6539
12	24	119	12	D6537L
14	28	108	14	D6537K/D6539
14	28	125	14	D6537L
16	32	116	16	D6537K/D6539
16	32	134	16	D6537L
18	36	124	18	D6537K/D6539
18	36	144	18	D6537L
20	40	132	20	D6537K/D6539
20	40	154	20	D6537L

HN-55 Carbide Corner Radius End Mill 4Flutes

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

4 flute

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	12	56	6	D6539
5	15	63	6	D6539
6	18	63	6	D6537K
6	20	67	6	D6537L/D6539
6	24	83	6	D6537L
8	24	80	8	D6537K/D6539
8	30	92	8	D6537L
10	30	90	10	D6537K/D6539
10	40	104	10	D6537L
12	36	103	12	D6537K/D6539
12	45	119	12	D6537L
14	45	108	14	D6537K/D6539
14	50	125	14	D6537L
16	45	116	16	D6537K/D6539
16	60	134	16	D6537L
18	45	124	18	D6537K/D6539
18	60	144	18	D6537L
20	50	132	20	D6537K/D6539
20	60	154	20	D6537L

Radius:R0.5-R2.0

HN-55 Carbide Spot Drills For Steel 2Flutes

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

2 flute

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	12	56	6	D6539
5	15	63	6	D6539
6	18	63	6	D6537K
6	20	67	6	D6537L/D6539
6	24	83	6	D6537L
8	24	80	8	D6537K/D6539
8	30	92	8	D6537L
10	30	90	10	D6537K/D6539
10	40	104	10	D6537L
12	36	103	12	D6537K/D6539
12	45	119	12	D6537L
14	45	108	14	D6537K/D6539
14	50	125	14	D6537L
16	45	116	16	D6537K/D6539
16	60	134	16	D6537L
18	45	124	18	D6537K/D6539
18	60	144	18	D6537L
20	50	132	20	D6537K/D6539
20	60	154	20	D6537L

HN55 Carbide Chamfering End Mill

3 flute
3刃

4 flute
4刃

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	12	56	6	D6539
5	15	63	6	D6539
6	18	63	6	D6537K
6	20	67	6	D6537L/D6539
6	24	83	6	D6537L
8	24	80	8	D6537K/D6539
8	30	92	8	D6537L
10	30	90	10	D6537K/D6539
10	40	104	10	D6537L
12	36	103	12	D6537K/D6539
12	45	119	12	D6537L
14	45	108	14	D6537K/D6539
14	50	125	14	D6537L
16	45	116	16	D6537K/D6539
16	60	134	16	D6537L
18	45	124	18	D6537K/D6539
18	60	144	18	D6537L
20	50	132	20	D6537K/D6539
20	60	154	20	D6537L

HN-60 Carbide Square End Mill 4Flutes

4 flute

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	12	56	6	D6539
5	15	63	6	D6539
6	18	63	6	D6537K
6	20	67	6	D6537L/D6539
6	24	83	6	D6537L
8	24	80	8	D6537K/D6539
8	30	92	8	D6537L
10	30	90	10	D6537K/D6539
10	40	104	10	D6537L
12	36	103	12	D6537K/D6539
12	45	119	12	D6537L
14	45	108	14	D6537K/D6539
14	50	125	14	D6537L
16	45	116	16	D6537K/D6539
16	60	134	16	D6537L
18	45	124	18	D6537K/D6539
18	60	144	18	D6537L
20	50	132	20	D6537K/D6539
20	60	154	20	D6537L

HN-60 Carbide Ball Nose End Mill 2Flutes

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

2 flute

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	4	56	6	D6539
5	5	63	6	D6539
6	6	63	6	D6537K
6	6	67	6	D6537L/D6539
6	6	83	6	D6537L
8	8	80	8	D6537K/D6539
8	8	92	8	D6537L
10	10	90	10	D6537K/D6539
10	10	104	10	D6537L
12	12	103	12	D6537K/D6539
12	12	119	12	D6537L
14	14	108	14	D6537K/D6539
14	14	125	14	D6537L
16	16	116	16	D6537K/D6539
16	16	134	16	D6537L
18	18	124	18	D6537K/D6539
18	18	144	18	D6537L
20	20	132	20	D6537K/D6539
20	20	154	20	D6537L

HN-60 Carbide Corner Radius End Mill 4Flutes

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
3	8	38	6	DIN6527K/DIN6527L
4	10	57	6	DIN6527L
5	15	57	6	DIN6527L
6	12	54	6	DIN6527K
6	15	57	6	DIN6527L/DIN6528
7	25	57	8	DIN6528
8	20	58	8	DIN6527K
8	25	63	8	DIN6527L/DIN6528
9	25	72	10	DIN6527L/DIN6528
10	20	66	10	DIN6527K
10	25	72	10	DIN6527L/DIN6528
12	25	73	12	DIN6527K
12	30	83	12	DIN6527L/DIN6528
14	30	75	14	DIN6527K
14	35	83	14	DIN6527L/DIN6528
16	30	82	16	DIN6527K
16	35	92	16	DIN6527L/DIN6528
18	40	82	18	DIN6527K
18	40	92	18	DIN6527L/DIN6528
20	30	92	20	DIN6527K
20	40	104	20	DIN6527L/DIN6528

4 flute

Mill D (mm)	Cutting length(mm)	Total length(mm)	Shaft D(mm)	DIN Standard
4	12	56	6	D6539
5	15	63	6	D6539
6	18	63	6	D6537K
6	20	67	6	D6537L/D6539
6	24	83	6	D6537L
8	24	80	8	D6537K/D6539
8	30	92	8	D6537L
10	30	90	10	D6537K/D6539
10	40	104	10	D6537L
12	36	103	12	D6537K/D6539
12	45	119	12	D6537L
14	45	108	14	D6537K/D6539
14	50	125	14	D6537L
16	45	116	16	D6537K/D6539
16	60	134	16	D6537L
18	45	124	18	D6537K/D6539
18	60	144	18	D6537L
20	50	132	20	D6537K/D6539
20	60	154	20	D6537L

Radius:R0.5~R2.0