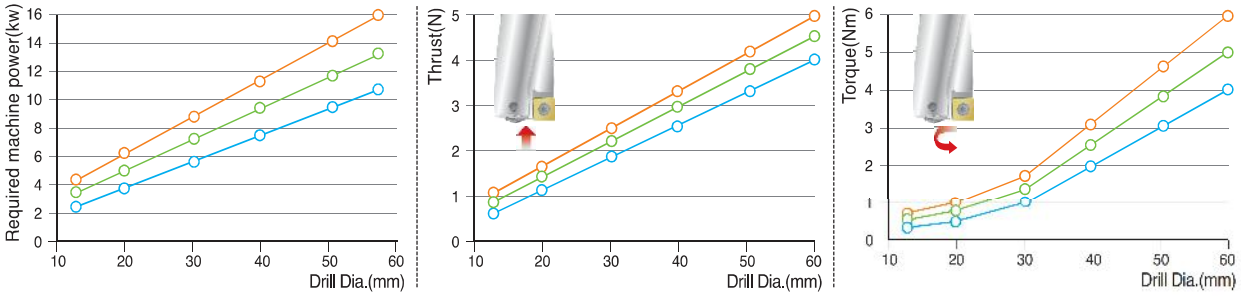
Required machine power

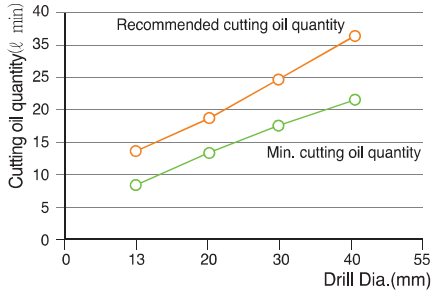
- The graphs below show the cutting force required in drilling.
- Machining with the KING DRILL and a machine with high rigidity and power.

- Workpiece : SCM440(240HB) • Cutting condition : vc(m/min)=100
- Through coolant system

fn(mm/rev)=0.13 fn(mm/rev)=0.10 fn(mm/rev)=0.07



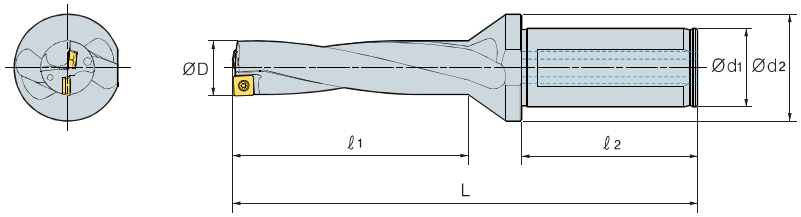
Cutting oil quantity



- **Workpiece** : SCM440(240HB)
- **Cutting condition** : vc(m/min)=100
- Through coolant system

- Recommended pressure of coolant : 5kg/cm2 above
- The data of the graph above could be changed depending on workpiece and cutting condition.

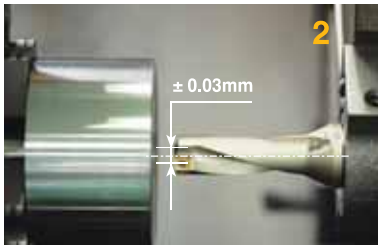
Drill tolerance and hole tolerance

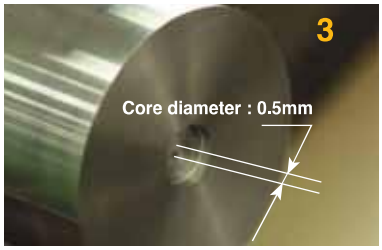


(mm)

Drill Dia.		Ø12 ~ Ø29	Ø30 ~ Ø45	Ø46 ~ Ø60
2D~3D	Drill tolerance(ØD)	0 ~ -0.15	0 ~ -0.15	0 ~ -0.15
	Hole tolerance	+0.2 ~ -0.1	+0.25 ~ -0.1	+0.28 ~ -0.1
4D~5D	Drill tolerance(ØD)	0 ~ -0.15	0 ~ -0.15	0 ~ -0.15
	Hole tolerance	+0.25 ~ -0.05	+0.3 ~ -0.05	+0.33 ~ -0.05

Notice for setting the drill in the lathe

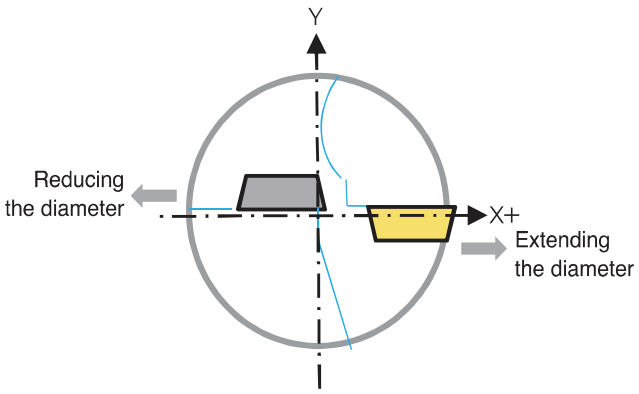




- Set the peripheral insert parallel to the X axis. (based on the side lock)
- If the machined core is 0.5mm after machining 5mm, that is the proper setting.

※ Please make sure that the location of the side lock could be different depending on manufacturers of machine.

Range of adjusting machining diameter in the lathe



- In machining in the lathe, the King Drill can extend and reduce the machining diameter with moving to the x axis. Please refer to the table showing the range of adjusting drilling diameter below.
- The more the drilling diameter is extended or reduced, the more the drill loses drilling balance. In this case, reduce the feed or cutting speed in machining.
- Reducing the machining diameter excessively could damage the holder.

(mm)

Drill dia.	Range of adjusting drilling diameter(Ø)	Drill dia.	Range of adjusting drilling diameter(Ø)	Drill dia.	Range of adjusting drilling diameter(Ø)	Drill dia.	Range of adjusting drilling diameter(Ø)
12.0	11.7 ~12.4	24.5	23.9 ~25.1	37.0	36.3 ~37.7	49.5	48.7 ~50.2
12.5	12.2 ~12.9	25.0	24.4 ~25.6	37.5	36.8 ~38.2	50.0	49.2 ~50.7
13.0	12.7 ~13.4	25.5	24.9 ~26.1	38.0	37.3 ~38.7	50.5	49.7 ~51.2
13.5	13.2 ~13.9	26.0	25.4 ~26.6	38.5	37.8 ~39.2	51.0	50.2 ~51.7
14.0	13.6 ~14.5	26.5	25.9 ~27.1	39.0	38.3 ~39.7	51.5	50.7 ~52.2
14.5	14.1 ~15.0	27.0	26.4 ~27.6	39.5	38.8 ~40.2	52.0	51.2 ~52.7
15.0	14.6 ~15.5	27.5	26.9 ~28.1	40.0	39.3 ~40.7	52.5	51.7 ~53.2
15.5	15.1 ~16.0	27.8	27.4 ~28.6	40.5	39.8 ~41.2	53.0	52.2 ~53.7
16.0	15.6 ~16.5	28.5	27.9 ~29.1	41.0	40.3 ~41.7	53.5	52.7 ~54.2
16.5	16.0 ~17.0	29.0	28.4 ~29.6	41.5	40.8 ~42.2	54.0	53.2 ~54.7
17.0	16.5 ~17.5	29.5	28.9 ~30.1	42.0	41.3 ~42.7	54.5	53.7 ~55.2
17.5	17.0 ~18.0	30.0	29.3 ~30.7	42.5	41.8 ~43.2	55.0	54.2 ~55.7
18.0	17.5 ~18.5	30.5	29.8 ~31.2	43.0	42.2 ~43.7	55.5	54.7 ~56.2
18.5	18.0 ~19.0	31.0	30.3 ~31.7	43.5	42.7 ~44.2	56.0	55.2 ~56.7
19.0	18.5 ~19.5	31.5	30.8 ~32.2	44.0	43.2 ~44.7	56.5	55.7 ~57.2
19.5	19.0 ~20.0	32.0	31.3 ~32.7	44.5	43.7 ~45.2	57.0	56.2 ~57.7
20.0	19.4 ~20.6	32.5	31.8 ~33.2	45.0	44.2 ~45.7	57.5	56.7 ~58.2
20.5	19.9 ~21.1	33.0	32.3 ~33.7	45.5	44.7 ~46.2	58.0	57.2 ~58.7
21.0	20.4 ~21.6	33.5	32.8 ~34.2	46.0	45.2 ~46.7	58.5	57.7 ~59.2
21.5	20.9 ~22.1	34.0	33.3 ~34.7	46.5	45.7 ~47.2	59.0	58.2 ~59.7
22.0	21.4 ~22.6	34.5	33.8 ~35.2	47.0	46.2 ~47.7	59.5	58.7 ~60.2
22.5	21.9 ~23.1	35.0	34.3 ~35.7	47.5	46.7 ~48.2	60.0	59.2 ~60.7
23.0	22.4 ~23.6	35.5	34.8 ~36.2	48.0	47.2 ~48.7	60.5	59.7 ~61.2
23.5	22.9 ~24.1	36.0	35.3 ~36.7	48.5	47.7 ~49.2		
24.0	23.4 ~24.6	36.5	35.8 ~37.2	49.0	48.2 ~49.7		

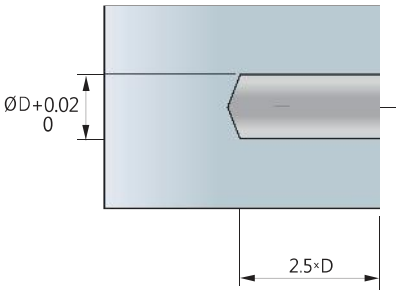
Insert and parts

Drill dia.	Peripheral insert	Central insert	Screw	Wrench	Torque(Nm)
Ø12.0~Ø13.5	SPMT040204-PD	XOMT040204-PD	FTNA0204	TW06P	0.4
Ø13.6~Ø16.0	SPMT050204-PD	XOMT050204-PD	FTNA0204	TW06P	0.4
Ø16.1~Ø19.5	SPMT060205-PD	XOMT060204-PD	FTKA02206S	TW07P	0.8
Ø19.6~Ø23.5	SPMT07T208-PD	XOMT07T205-PD	FTKA02565	TW07S	0.8
Ø23.6~Ø29.5	SPMT090308-PD	XOMT090305-PD	FTKA0307	TW09S	1.2
Ø29.6~Ø35.5	SPMT11T308-PD	XOMT11T306-PD	FTKA03508	TW15S	3
Ø35.6~Ø42.5	SPMT130410-PD	XOMT130406-PD	FTKA0410	TW15S	3
Ø42.6~Ø50.5	SPMT15M510-PD	XOMT15M508-PD	FTNC04511	TW20S	5
Ø50.6~Ø60.5	SPMT180510-PD	XOMT180508-PD	FTNA0511	TW20-100	5

- In clamping an insert, please clean the tip seat and apply CASMOLY1000 on the screw.
- Please make sure to use a Korloy-produced wrench and screw only.

Application of Gun Drill on machining center

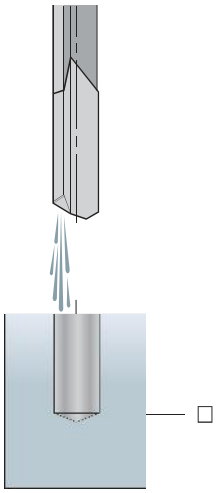
1 Machining of a pilot hole



1. A pilot hole is necessary in machining on a machining center instead of a guide bush.
2. The diameter of the pilot hole should be 0.01~0.02(H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 2.5×D.
3. Use Mach Drill(MSD) for machining of a pilot hole.

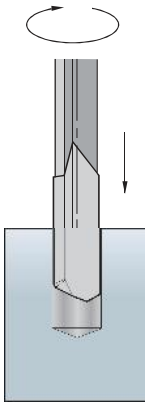
MSD

2 Moving the Gun Drill to the pilot hole



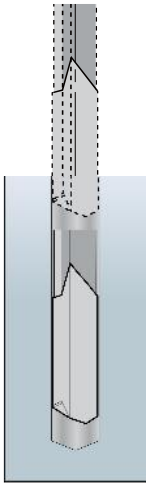
1.The Gun Drill should not drill before entering into the pilot hole.
2.Coolant is necessary for gun drilling.

3 Start Gun Drilling.



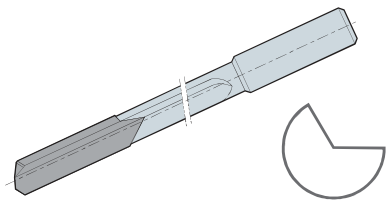
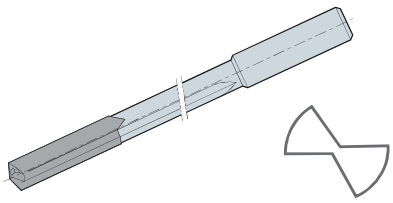
1.Rotate the spindle.
2.Machine with drilling to vertical axis.

4 After gun drilling



1.Return the drill.
2.Stop drilling and supplying coolant.
3.Remove the Gun Drill.

Features

	Single Lip type	Twin Lip type
Shape		
Drill Dia.	Ø2.0 ~ Ø33.0	Ø6.0 ~ Ø26.5
Depth of drilling	≥ 2,000mm	≥ 1,000mm
Tolerance	IT9	IT10
Surface finish	Ra 0.1 ~ 3.0μm	Ra 1.0 ~ 4.0μm
Application	• For all kinds of workpiece machining	• Workpieces with good chip evacuation • Machining of at higher feed than single lip type's

Recommended cutting condition

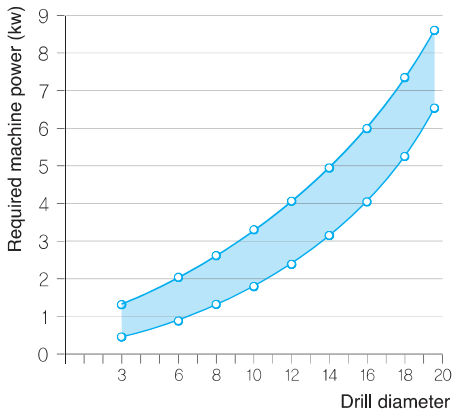
Workpiece	Hardness (HB)	Cutting speed vc(m/min)	Feed rate, fn(mm/rev)					
			~Ø4	~Ø6	~Ø10	~Ø14	~Ø24	Ø25~
Carbon steel Alloy steel	~150	100~150	0.005~0.015	0.010~0.025	0.015~0.035	0.020~0.050	0.030~0.070	0.040~0.080
	150~250	80~120	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.030~0.060	0.030~0.060
	250~350	50~100	0.005~0.010	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.020~0.040
	350~	~30	-	0.005~0.010	0.005~0.010	0.010~0.020	0.020~0.035	0.020~0.035
Stainless steel	~250	50~80	0.005~0.015	0.010~0.020	0.010~0.020	0.010~0.030	0.020~0.035	0.020~0.040
	250~350	40~50	-	0.005~0.015	0.010~0.015	0.010~0.020	0.010~0.020	0.010~0.020
Cast iron	~220	80~100	0.010~0.0120	0.020~0.040	0.030~0.050	0.040~0.080	0.080~0.120	0.100~0.150
	220~	40~80	0.005~0.010	0.005~0.015	0.010~0.020	0.015~0.030	0.020~0.050	0.025~0.070
Aluminum alloy	-	180~250	0.010~0.020	0.020~0.040	0.030~0.060	0.040~0.080	0.100~0.180	0.150~0.200
Light alloy	-	120~200	0.005~0.010	0.010~0.020	0.020~0.025	0.020~0.030	0.030~0.040	0.040~0.060

Technical information

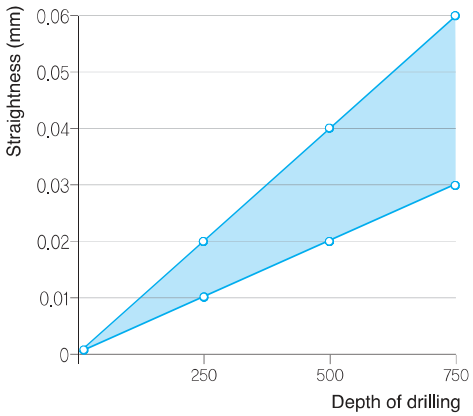
The factors below determines the straightness of hole.

- Drill diameter and depth of drilling
- Cutting condition and kind of application
- Kind of workpiece and machine
- Drill bush

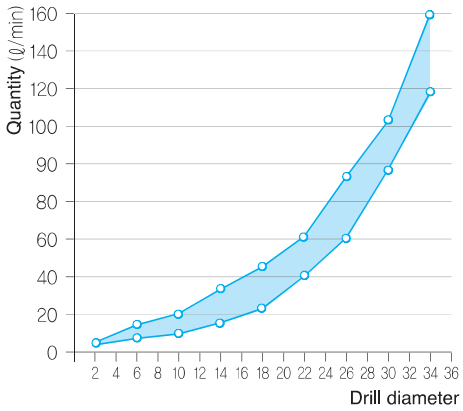
Required machine power



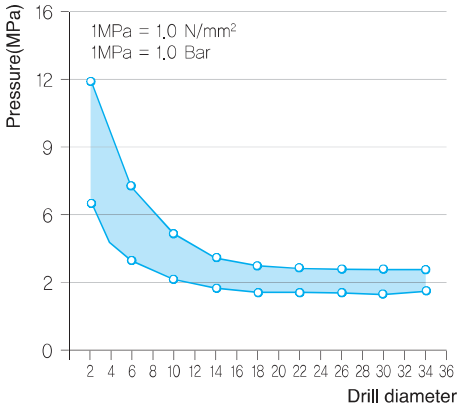
Straightness



Quantity of coolant



Pressure of coolant



The above graph shows general information and it is changeable depending on kind of tool, workpieces, and cutting conditions etc.

- **Pressure and quantity of coolant** - High pressure of coolant ensures excellent chip evacuation and cooling the cutting edge.
- **Use a filter for removing impurities** - The diameter of a filter should be less than 20㎛. Impurities could make bad flow of coolant, wear on a tool, and high load on the cooling pump.
- **Temperature of coolant -** Proper temperature of coolant : 20°C~ 22°C / Do not use coolant at 50°C above