SHIN-IL

Specialized in Deep Hole Solutions

Brazed Gun Drill

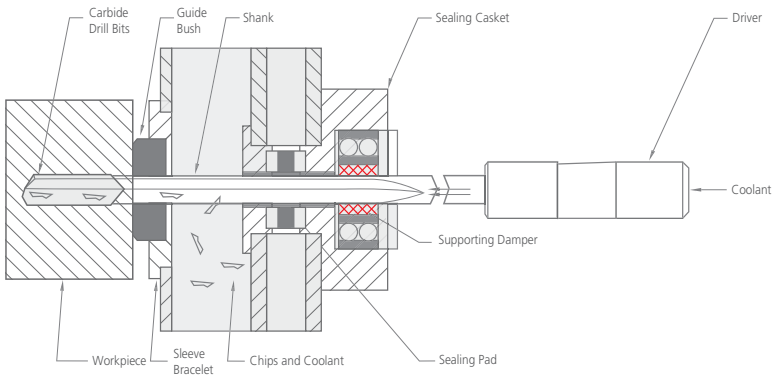
The brazed gun drill can be manufactured with various carbide material selections, depending on the workpiece material. This is achieved through a fully brazed drill tip, drill rod, and drill driver with a reasonable tool design. The bit is generally made of integral solid carbide, with the tip portion brazed to a heat-treated drill rod. This is then connected to a finely polished steel drill driver. For special workpiece materials, drill bits can also be treated with different kinds of coatings

SHIN - IL MACHINERY CO. , LTD.

The gun drill has a decisive impact on the generation and development of deep hole drilling technology. The single flute drills can achieve high quality drilling tolerance, surface and small vibration variance. This allows the gun drill to be used in precise hole machining. In practical application, the direct drills operation can replace part of the reaming operation, which has a strong sense of mechanical reliability.

The gun drill is composed of carbide drill bit, drill rod, and driver, which can be suitable for most of material processing, such as cast iron, stainless steel, aluminum, graphite, wood products, and all kinds of nonferrous metals. The gun drill is a single flute cutting tool, the hole needs to be guided by the guide bush. With the development of the CNC machine industry, gun drill tools are suitable not only for their own use, but also for CNC lathes and machining centers.

Shin-IL company can produce drill tools with diameter of 1 mm-50mm, the length ratio is more than 250x, and the longest length can reach 5000mm. The pattern of drill tool is divided into standard gun drills and non standard (step gun drills, spherical gun drills, etc.). Coating and PCD gun drills, overall solid carbide drills, and indexable insert gun drills etc are all available.



- Use vertical and horizontal equipment with a high pressure internal cooling system
- Use special cutting oil or coolant for deep hole drilling and make sure to provide sufficient pressure and flowrate.
- Because the gun drill without self-center orientation, so in the processing it must use guide sleeve or pilot hole, serves as centering for gun drill machining.
- Using the correct machining parameters for optimal drilling hole processing.

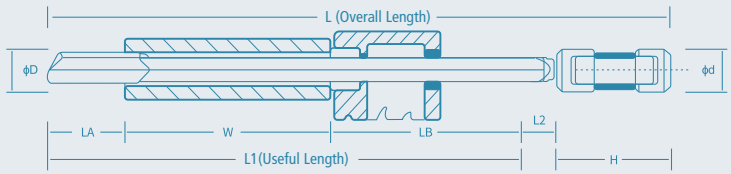
Maximum Length
5000mm

Diameter Range
1mm-50mm

Gun Drill Order Format And The Calculation of Length

1. The nominal cutting blade diameter can be subdivided to 0.001mm according to customer needs
2. Please mark the order according to the following standard

D(Drill Bit Diameter) x L(Overall Length) – Driver Number



L(overall length)	D=drill bit diameter	W=drilling depth	L=overall length	LB=width of supporting guide casket
L1(useful length)	H=driver number	LA=drill tip length	L1=useful length	L2=minimum for chips discharge allow

overall length calculated as follows:

overall length= LA (drill tip length) + W (drilling depth) + LB (width of supporting guide casket) + L2 (minimum for chips discharge allow) + H (driver length)

3. Please highlight the workpiece material, hardness, hole tolerance, and hole roughness
4. Mark the driver code number (catalog page23, page24. page28.)

Extra Technical Service

Grinding Tools

Provide carbide gun drill grinding service according to customer request

Replace, and weld the new carbide drill (Assume drill driver and rod are available for use)

1.Check the status of the gun drill
2.Remove worn or damaged drill bits and drill rods
3.Install and weld a new bit
4.Calibrate the gun drill

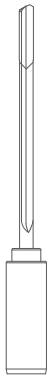
Replace and renew drill tips and rods. (Assume drill driver is available for use)

1.Check the status of the gun drill
2.Remove worn or damaged drill bits and drill rods
3.Install and weld new drill bits and drill rods
4.Calibrate the gun drill

Coating Service

Provide standard and necessary coating service for drilling tools.

Brazed Single Flute Gun Drill



The brazed single flute gun drill can be manufactured according to various carbide material selections according to the work piece material with a fully welded drill tip, drill rod and drill driver through reasonable tool design. The bit is usually made of integral solid carbide, with the tip portion welded to a heat treated drill rod and then linked to a finely polished steel drill driver. For special materials of the workpiece, drill bits can also be treated with different kinds of coatings.

Maximum Length
5000mm

Diameter Range
2.00-40.00

Product Features

Hole drilling can be processed in good precision , high cutting stability, excellent drilling quality (straightness, roughness, roundness). Drill bits can be sharpened several times. It can be customized according to customer requirements and can also be used for gun drilling machines, machining centers and modified lathes.

Brazed Twin Flute Gun Drill

Brazed twin flute gun drill has two symmetrical cutting blades, which has the same cutting fluid circulation system as the single flute gun drill. The cutting flute has two oil holes in the cutting head provided coolant to the blades. The mixture of the coolant and chips are discharged from the "V" groove outside of the cutting tube. Brazed twin flute gun drill is made with drill tip, rod, and driver welded to a whole body, and can also be made of full carbide material. However, due to the limited discharge space of twin flute gun drill, it is suitable for processing soft and brittle materials.

Maximum Length
3000mm

Diameter Range
6.00- 25.00

Product Features

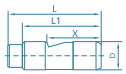
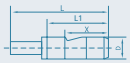
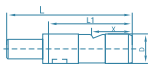
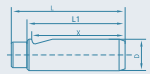
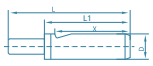
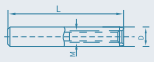
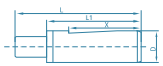
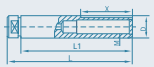
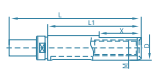
Faster drilling speed than single flute gun drill. But only limited to the processing of cast iron or similar products.

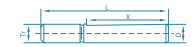
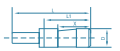
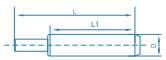
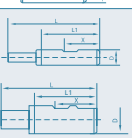
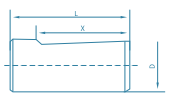
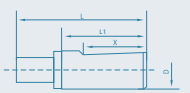
Stock of Brazed Single Flute Gun Drill

Specification	235mm(L)		270mm(L)		Driver	800 mm (L)	1000 mm (L)	1200 mm (L)	1440 mm (L)	1650 mm (L)	1800 mm (L)	Driver
	Standard	Coating	Standard	Coating								
φ3.02	◆	◆			10*40	◆	◆					25*70
φ3.52	◆	◆				◆	◆					
φ4.02	◆	◆				◆	◆	◆				
φ4.52	◆	◆				◆	◆	◆				
φ5.02	◆	◆				◆	◆	◆	◆			
φ5.52	◆	◆					◆	◆	◆			
φ6.02	◆	◆					◆	◆	◆	◆		
φ6.52	◆	◆					◆	◆	◆	◆		
φ7.02	◆	◆	◆				◆	◆	◆	◆		
φ7.52	◆	◆					◆	◆	◆	◆		
φ8.02	◆	◆	◆				◆	◆	◆	◆	◆	
φ8.52	◆	◆					◆	◆	◆	◆		
φ9.02	◆	◆	◆				◆	◆	◆	◆		
φ9.52	◆	◆					◆	◆	◆	◆		
φ10.02	◆	◆	◆				◆	◆	◆	◆	◆	
φ10.52	◆	◆					◆	◆	◆	◆		
φ11.02	◆	◆	◆					◆	◆	◆		
φ11.52	◆	◆						◆	◆	◆		
φ12.02	◆	◆	◆					◆	◆	◆	◆	

◆ = available stock

Standard Driver of The Brazed Gun Drill

Specification	Diameter (mm)	Drawing	Length Calculation		Fix Position X	Screw Spec M
			L1	L		
SH10-00	10		40		24.0	
SH16-03	16		45	53	31.0	
SH25-00	25		70	78	34.0	
SH10-01	10		40	57	24.0	
SH16-04	16		45	72	31.0	
SH25-01	25		70	105	34.0	
SH16-02	16		50	58	47.5	
SH16-33	16		50	77	47.5	
SH10-06	10		60			M6x0.5
SH16-15	16		80			M10x1
SH25-08	25		100			M16x1.5
SH10-28	10		60	77		M6x0.5
SH16-22	16		60	105		M10x1
SH25-10	25		100	140		M16x1.5
SH12.7-00	12.7		38.1		25.3	
SH19.05-01	19.05		70		45.0	
SH25.4-00	25.4		70		57.5	
SH31.7-00	31.7		70		57.5	
SH38.1-01	38.1		70		57.5	
SH19.05-11	19.05		70	97	45.0	
SH25.4-11	25.4		70	100	57.5	
SH31.7-01	31.7		70	111	57.5	
SH38.1-01	38.1		70	110	57.5	
SH10-44	10		60	68	35	M6x0.5
SH16-31	16		80	90	37	M10x1
SH25-34	25		100	100	45	M16x1.5
SH16-66	16		80	80	37	M10x1
SH25-40	25		100	100	45	M16x1.5
SH10-30	10		40	40	28.0	
SH12-14	12		45	45	33.0	
SH16-70	16		48	48	36.0	
SH20-56	20		50	50	38.0	

Specification	Diameter (mm)	Drawing	Length Calculation		Fix Position X	Screw Spec M
			L1	L		
SH16-00	16		112		73.0	TR16x1.5
SH20-00	20		126		82.0	TR 20x2
SH28-00	28		126		82.0	TR 28x2
SH36-00	36		162		109.0	TR 36x2
SH16-21	16		40		28.0	
SH25-16	25		50		35.0	
SH35-00	35		60		40.0	
SH16-30	16		40	67	28.0	
SH25-20	25		50	77	35.0	
SH35-01	35		60	100	40.0	
SH10-40	10		40			
SH12-18	12		45			
SH16-11	16		48			
SH20-01	20		50			
SH25-11	25		56			
SH32-24	32		60			
SH40-03	40		70			
SH10-41	10		40	57		
SH12-19	12		45	62		
SH16-20	16		48	75		
SH20-60	20		50	77		
SH25-21	25		56	86		
SH32-23	32		60	100		
SH40-04	40		70	110		
SH10-11	10		40		23.5	
SH12-07	12		45		26.5	
SH16-32	16		48		29.0	
SH20-29	20		50		30.5	
SH25-22	25		56		38.0	
SH32-10	32		60		43.0	
SH40-13	40		70		47.0	
SH10-23	10		40	57	23.5	
SH12-02	12		45	62	26.5	
SH16-53	16		48	75	29.0	
SH20-34	20		50	77	30.5	
SH25-31	25		56	86	38.0	
SH32-11	32		60	100	43.0	
SH40-14	40		70	110	47.0	
SH10-20	10		40		28.0	
SH12-08	12		45		33.0	
SH16-47	16		48		36.0	
SH20-40	20		50		38.0	
SH25-36	25		56		44.0	
SH32-12	32		60		48.0	
SH40-18	40		70		66.0	
SH10-24	10		40	57	28.0	
SH12-05	12		45	62	33.0	
SH16-51	16		48	75	36.0	
SH20-43	20		50	77	38.0	
SH25-37	25		56	86	44.0	
SH32-13	32		60	100	48.0	
SH40-17	40		70	110	66.0	
SH10-29	10		40		28.0	
SH12-13	12		45		33.0	
SH16-62	16		48		36.0	
SH20-55	20		50		38.0	

BRAZED GUN DRILLS

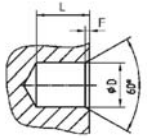
Machining Parameters of The Brazed Single Flute Gun Drill

Workpiece Material	Spring Steel Preharden Steel Cast Iron Chilled Cast Iron Titanium Alloy Special Steel (Nickel Base Heat Resistant Alloy Nickel Alloy)	Stainless Steel Anti Corrosive Stainless Steel Austenitic Stainless Steel 18~25%Cr Ni＞8%	Martensitic Stainless Steel Ferritic Steel (Normal Stainless Steel Cast Stainless Steel) 13~25%Cr Free Cutting Steel (Sulphurized Steel)	Allov Steel Quenching and Tempered Steel Case Hardened Steel Nitriding Steel Tool Steel (＞900N/mm²)	Cast Iron Grey Cast Iron (＜300N/mm²) Nodular Cast Iron (＜400N/mm²)	Cast Iron Grey Cast Iron (＜300N/mm²) Grey Cast Iron (＜400N/mm²) Malleable Cast Iron White Heart Malleable Cast Iron Black Heart Malleable Cast Iron	Structural Steel Quenching and Tempered Steel High Carbon Low Alloy Steel Case Hardened Steel Nitriding Steel Tool Steel (＞900N/mm²) Free Cutting Steel	Brass Bronze Copper Plastic	Aluminium Cast Aluminium Si＞5% Free Cutting Aluminium	Aluminium Cast Aluminium Si＞5% Non Quenched Aluminium
Cutting Speed m / min	25~60	30~60	40~70	60~80	60~90	70~100	70~100	80~150	80~160	100~300
Diameter Φ	Feed Rate: mm / rev					Feed Rate: mm / rev				
2.0~2.49	0.001~0.002	0.002~0.005	0.002~0.006	0.002~0.005	0.005~0.018	0.005~0.019	0.003~0.007	0.003~0.015	0.002~0.012	0.005~0.005
2.5~2.99	0.001~0.005	0.004~0.007	0.004~0.007	0.004~0.006	0.008~0.028	0.008~0.02	0.005~0.010	0.005~0.020	0.004~0.026	0.004~0.008
3.0~3.49	0.002~0.007	0.006~0.008	0.005~0.009	0.005~0.007	0.009~0.038	0.009~0.038	0.007~0.012	0.006~0.030	0.006~0.037	0.006~0.012
3.5~3.99	0.004~0.008	0.008~0.009	0.007~0.011	0.007~0.010	0.011~0.042	0.011~0.046	0.009~0.015	0.007~0.045	0.007~0.055	0.007~0.025
4.0~4.49	0.006~0.009	0.009~0.010	0.008~0.013	0.008~0.012	0.012~0.047	0.012~0.050	0.012~0.019	0.008~0.050	0.008~0.071	0.008~0.026
4.5~4.99	0.008~0.011	0.010~0.013	0.009~0.017	0.011~0.015	0.016~0.052	0.016~0.057	0.014~0.020	0.009~0.057	0.009~0.094	0.009~0.028
5.0~5.99	0.010~0.014	0.012~0.015	0.013~0.019	0.013~0.018	0.018~0.065	0.018~0.068	0.016~0.026	0.010~0.069	0.010~0.109	0.010~0.036
6.0~6.99	0.012~0.016	0.014~0.017	0.015~0.023	0.015~0.022	0.024~0.071	0.024~0.074	0.018~0.028	0.012~0.079	0.012~0.125	0.012~0.045
7.0~7.99	0.015~0.018	0.016~0.019	0.018~0.026	0.018~0.025	0.028~0.084	0.028~0.085	0.021~0.035	0.014~0.092	0.018~0.130	0.014~0.049
8.0~8.99	0.018~0.021	0.018~0.021	0.020~0.031	0.020~0.027	0.032~0.092	0.032~0.096	0.024~0.036	0.016~0.101	0.020~0.144	0.016~0.056
9.0~9.99	0.021~0.025	0.020~0.028	0.023~0.034	0.023~0.030	0.036~0.110	0.036~0.114	0.027~0.040	0.018~0.113	0.023~0.158	0.018~0.034
10.0~11.99	0.025~0.030	0.025~0.033	0.025~0.041	0.025~0.038	0.045~0.116	0.050~0.120	0.030~0.04	0.020~0.139	0.025~0.174	0.020~0.074
12.0~13.99	0.027~0.033	0.030~0.044	0.030~0.045	0.029~0.044	0.051~0.126	0.060~0.138	0.036~0.060	0.024~0.156	0.030~0.182	0.024~0.087
14.0~15.99	0.029~0.040	0.035~0.044	0.035~0.052	0.035~0.050	0.057~0.138	0.070~0.154	0.042~0.071	0.028~0.179	0.035~0.194	0.028~0.099
16.0~17.99	0.033~0.044	0.041~0.050	0.042~0.060	0.039~0.053	0.620~0.158	0.079~0.170	0.048~0.079	0.033~0.199	0.050~0.209	0.033~0.108
18.0~19.99	0.037~0.049	0.045~0.062	0.045~0.067	0.044~0.060	0.066~0.173	0.090~0.191	0.054~0.091	0.036~0.244	0.054~0.228	0.036~0.130
20.0~23.99	0.041~0.054	0.049~0.071	0.050~0.079	0.049~0.069	0.069~0.189	0.106~0.207	0.060~0.107	0.040~0.249	0.060~0.254	0.040~0.146
24.0~27.99	0.045~0.057	0.052~0.083	0.054~0.090	0.054~0.0077	0.076~0.210	0.120~0.221	0.069~0.117	0.048~0.291	0.072~0.295	0.048~0.169
28.0~31.99	0.049~0.062	0.057~0.091	0.059~0.098	0.059~0.085	0.079~0.212	0.140~.0237	0.079~0.134	0.056~0.327	0.084~0.360	0.056~0.194
32.0~40.0	0.052~0.065	0.063~0.098	0.065~0.107	0.063~0.098	0.086~0.228	0.160~0.245	0.085~0.154	0.064~0.380	0.096~0.455	0.064~0.221

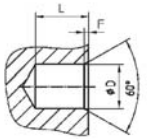
- The cutting speed and feed rate depend on : tool diameter, tool length, cutting fluid, workpiece material, characterization of machine and clamping condition. The processing parameters in the above table are the standard normal value for reference. The practical actual working conditions on site are the true value.

- The cutting speed and feed rate depend on : tool diameter, tool length, cutting fluid, workpiece material, characterization of machine and clamping condition. The processing parameters in the above table are the standard normal value for reference. The practical actual working conditions on site are the true value.

Guiding Hole Dimensions for Brazed Gun Drill

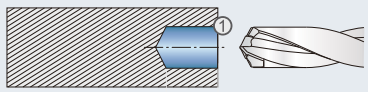
Diameter Range	Diameter of Drill	Diameter of Guiding Hole	Contrast of The Guiding Hole and Drilling Depth							
			L×D Drilling depth	Guiding Hole Depth						
				Φ1.805 -4.000	Φ4.001 -8.500	Φ8.501 -12.000	Φ12.001 -20.999	Φ21.000 -30.999	Φ31.000 -40.999	Φ41.000 -55.000
	1.85mm - 4.00mm	+0.005 to +0.010	ap.10×D	2.0×D	1.0×D	1.0×D	1.0×D	1×D	1×D	1×D
	4.01mm - 12.00mm	+0.010 to +0.020	ap.20×D	3.0×D	1.5×D	1.5×D	1.5×D			
	12.01mm - 50.00mm	+0.015 to +0.040	ap.25×D	4.0×D	2.0×D	2.0×D	1.5×D			
			ap.30×D	6.0×D	3.0×D	3.0×D	1.5×D			
			ap.35×D	30mm	35mm	3.0×D	1.5×D			
			ap.40×D	30mm	35mm	3.0×D	1.5×D			

Guiding Hole Dimensions for Solid Carbide Gun Drill

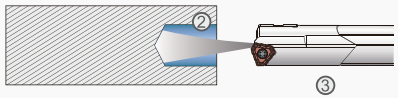
Diameter Range	Diameter of Drill	Diameter of Guiding Hole	Contrast of The Guiding Hole and Drilling Depth				
			L×D Drilling Depth	Guiding Hole Depth			
				Φ0.500-1.599	Φ1.600-3.999	Φ4.000-6.999	Φ7.000-12.000
	0.500mm - 4.000mm	+0.005 to +0.010	ap.20×D	2.0×D	2.0×D	2.0×D	2.5×D
	4.001mm - 12.000mm	+0.010 to +0.020	ap.30×D		3.0×D	3.0×D	3.5×D
			ap.40×D		4.0×D	4.0×D	40mm
			ap.50×D	6.0×D	6.0×D	35mm	
			ap.60×D		30mm		
			>40×D				

Indexable Insert Gun Drill Apply on CNC Machine and Lathe

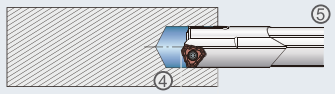
Please Follow The Instructions For Good Performance



① Prepare a pilot hole
Hole tolerance: +0.01-+0.1mm
Depth of hole: H=15mm

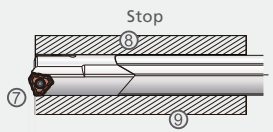


② Turn on coolant
③ Drill slowly into the pilot hole
Revolving speed: n=50-100min-1
Feed rate: Vf=100-300mm/min
Notice: do not enter the pilot hole at high speed



④ Stop at 10mm after enter the pilot hole
⑤ Start process at normal revolving speed

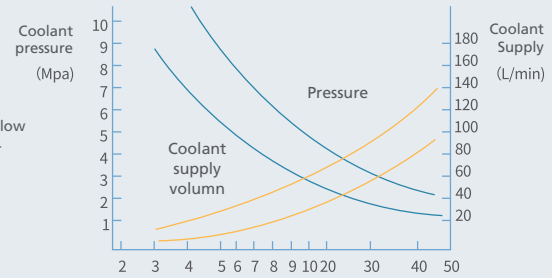
⑥ Start axial moving at 10-20mm while entering the hole at feed rate 80% of the program speed. After drilling depth more than 20mm, drilling speed trends toward to 100% of the program speed.



⑦ Drilling through hole: Continuous drilling till the drill tip thrust 5mm out of the hole.
⑧ Stop spindle revolving and turn off the coolant.
⑨ Withdraw the drill tip.

1

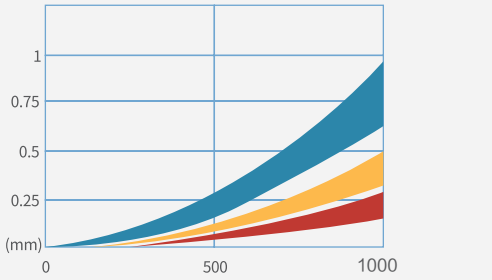
Coolant pressure, coolant flow rate varies on the diameter of the gun drill. (horizontal axis)



2

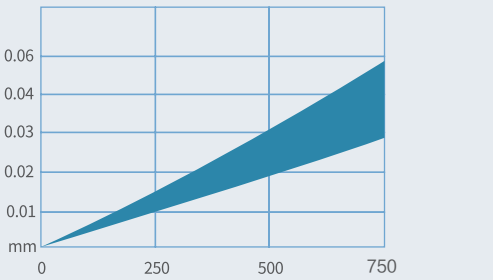
Drilling deviation (vertical axis) varies with the drilling depth (horizontal axis)

- Tools revolving, workpiece standstill
- Tools standstill, workpiece revolving
- Tools revolving, workpiece anti-revolving



3

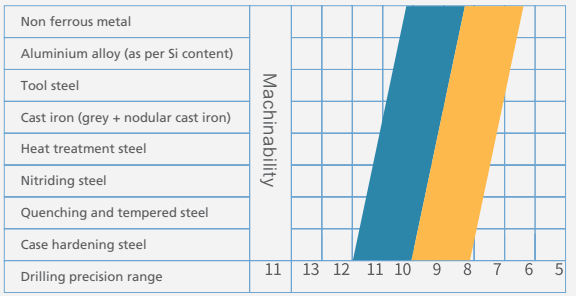
Straightness (vertical axis) varies with drilling depth (horizontal axis)



4

Single Flute Tolerance

- Normal Condition
- Good Condition



Recommended Value

5

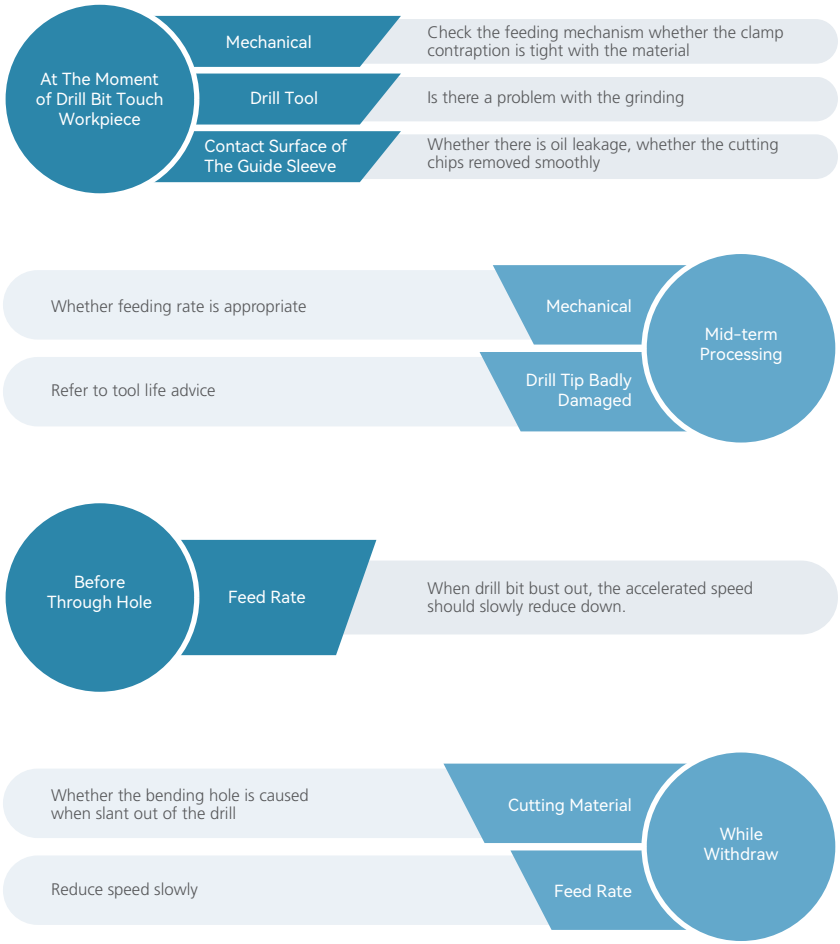
Surface Quality

- Normal Condition
- Good Condition

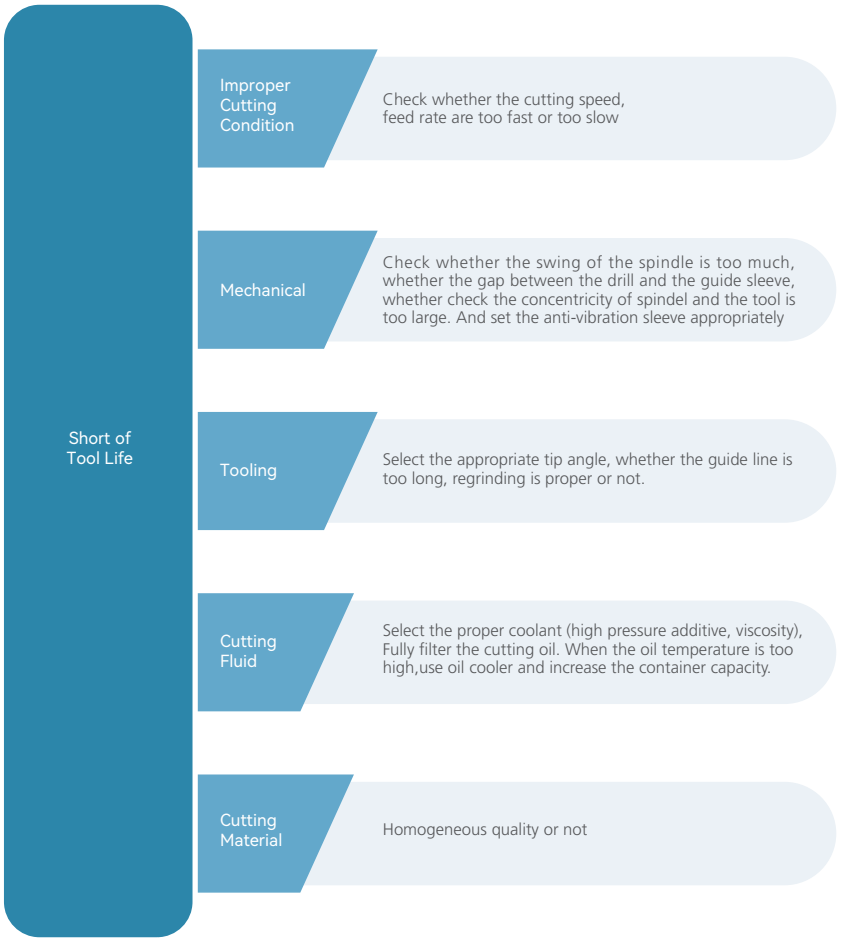
Grade of Roundness		N8	N7	N6	N5	N4	N3
Quality Zone							
Surface Roughness	R1μm	21	11.5	6.2	3.4	1.9	1.0
	Raμm	3.2	1.6	0.8	0.4	0.2	0.1
	Rzμm	14	7.6	4.5	2.2	1.2	0.65

Recommended Value

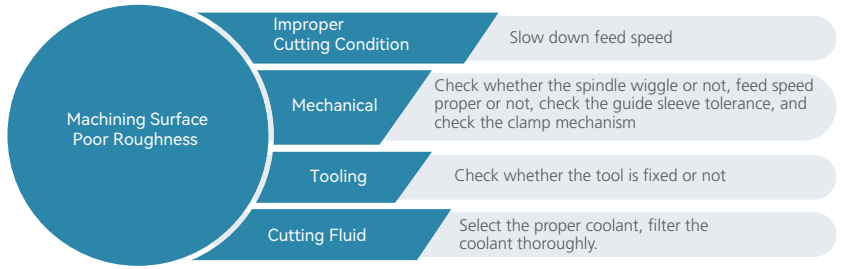
Wear and Broken Problem

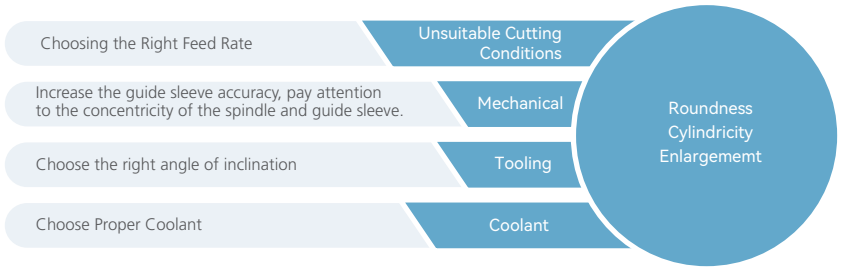


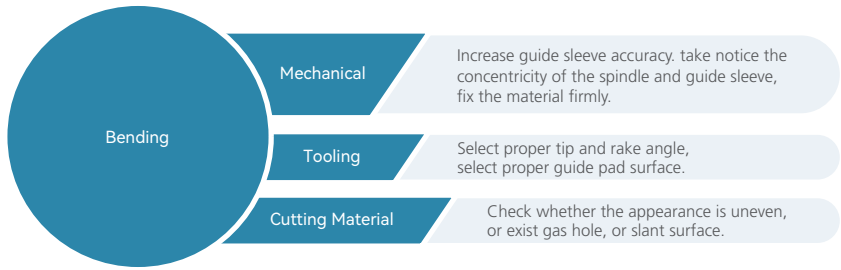
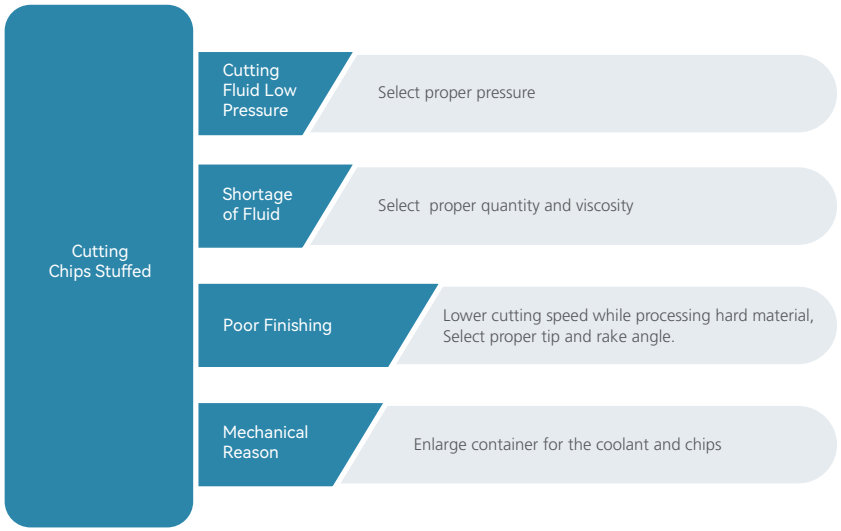
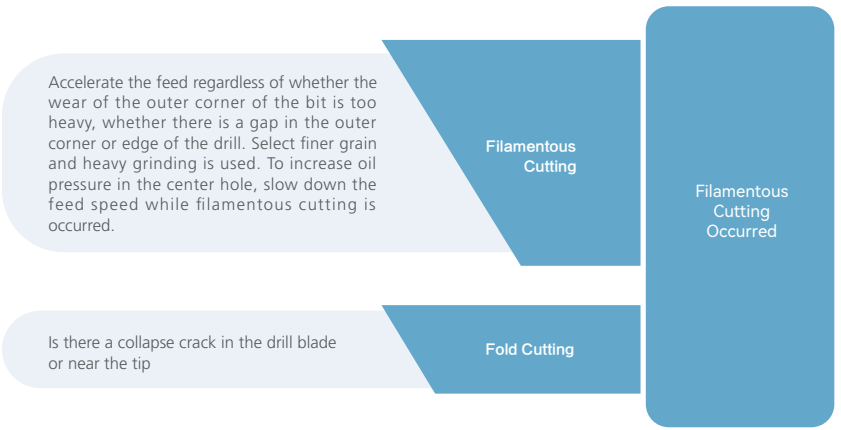
Tooling Life



Machining Accuracy







Cutting Solution