

GUNDRILL DRILL HEAD CATALOG

We are china manufacturer of gun drills, located in Dezhou, Shandong which is a base city for deep hole drilling. We can produce many sizes of gun drills as well as non standard gun drills according to clients' special requirements.

We focus on gun drill production business. We have special deep hole drilling tool machines. Our gun drill carbide tip (brand ESTECH) is sourced from Switzerland, which guarantees the quality of the tool. ESTECH was founded in 1941, is a partner of Botek.

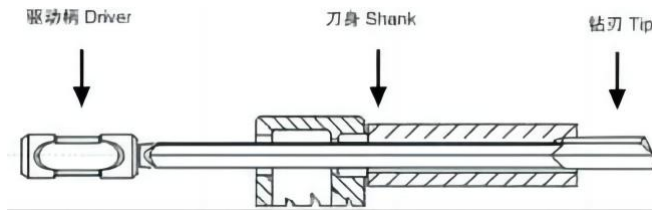
Our company invites famous cutting tool professors in this industry to instruct the research and development. With many years development, we have our own technique process, and registered our own brand. Nowadays,our products are sold well in domestic market and overseas,and are highly praised by our customers.

As a good private owned company, we have innovative, capable and flexible structure, and complete and scientific quality control system. Our gun drills are high hardness, good rigidity, high accuracy, long lasting, and good cost performance.

Continuous improvement of the process, solid progress to produce the gun drills, creating a national brand, and to pursue the excellence is our eternal goal.



Brazed gun drill structure

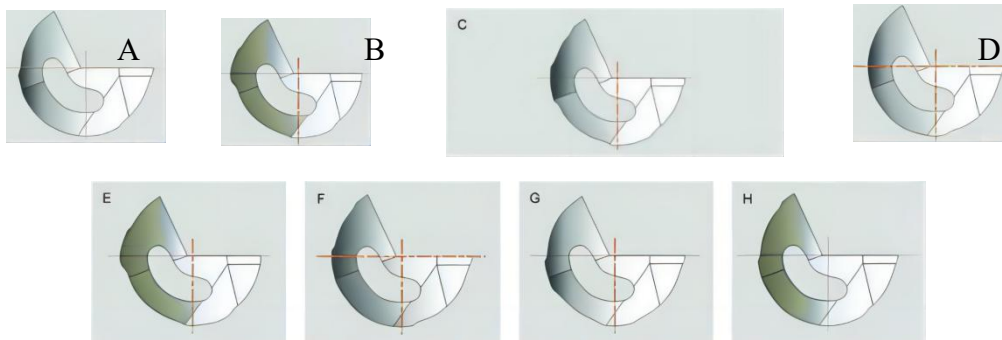


As a key part to the gun drill, Drill Edge guarantees cutting and self-guidance by its specifically scientific combination structure to drill a highly precise hole by one-time penetration. Drill edge has two basic parameters. On the basis of the parameters, the best combination can be selected according to workpiece material and form for better balance between cutting force and chip breaking and transferring cutting force to support shoulder with the aim of good straightness and coaxiality. Drill tip can make drill body rotates freely without friction against internal hole wall. According to different requirements, the edge has single circular hole, kidney-shaped hole and double-circular holes with channels connected to oil passage of the tool blade so that high-pressure coolant travels through the passage to the cutting point and removes chips.

Shank is made of special aviation alloy steel through heat treatment. The blade has a 115-165°V-shot where high -pressure cutting fluid passes through driven handle and oil hole to be drained away with chips. To guarantee cutting straightness and coaxiality, the blade shall be strong enough to provide the torque needed by cutting under small twist deformation; meanwhile, it shall be tough to absorb vibration resulted from high-speed blade rotation.

Driven Handle transfers torque between machine tool and drill bit; high-rotation precision between drill handle and stem avoids extra vibration to improve precision and reliability. Our gun drill is fabricated entirely in accordance with standardized machining. Its neck with the blade has a smooth arc slot to remove stress for avoiding damage due to stress concentration.

The circumferential shapes developed by our company are specially tailored to the respective application.



A. Standard form suitable for most of materials and drilling jobs. With this shape the tool diameter can no longer be measured after manufacture. This standard starting point of the guide pad is 60; but can range from 45° to 80°.

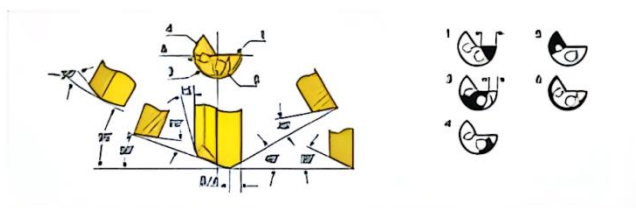
B. This Form is the preferred choice for narrow tolerances in terms of the bore diameter and finish. Some of the guide pads are convex ground. The spherical grinding heel can protrude over the guide pads.

C. This form is for awkward approaches to drilling work or cross drilling, machining of soft materials and poor performance of cooling lubricant. Often used on the long drill head.

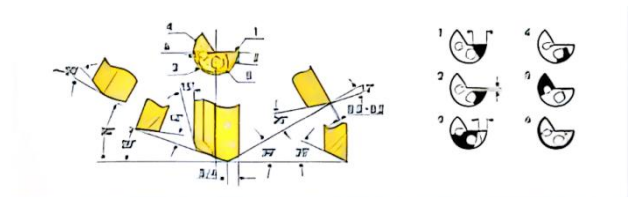
D. This form is almost exclusively used for soft materials, such as grey cast iron, graphite etc, especially in conjunction with narrow bore tolerances.

Brazed single flute gun drill grinding angles

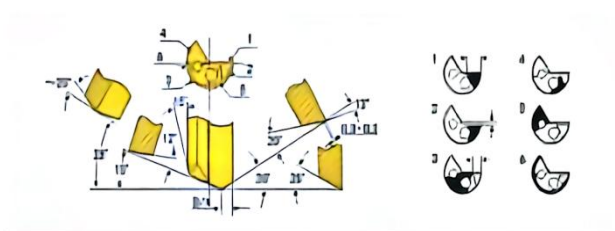
Diameter < 5.00mm



Diameter 5.00 ~ 20.00mm



Diameter > 20.00mm



PS: We can adjust the angles according to the material being drilled and accuracy requirements.

Attentions for Edge Grinding of carbide Gun Drill:

1. Gun drill shall be compulsorily ground regularly. In other words, reg rinding shall be conducted in case back wear extent of the cutter reaches the indicated size.

2. The feed amount each time for grinding shall not be excessive, which may cause the carbide drill bit cracking and breaking, leading to personal injury.

3. The stressing direction of the bit in grinding shall be toward the cutter shim to prevent cutter damage resulted from drill stem shaking.

4. After the five cutting edges of the bit are ground, the corner angle between the back cutting edge of the bit and the bit guide shall be rounded with grinding wheel manually.

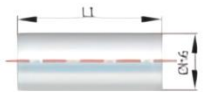

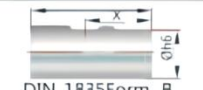
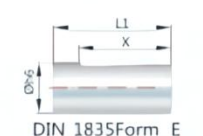
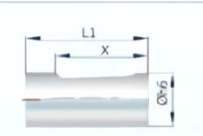
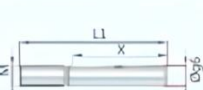

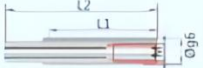


5. Gun drill shall be reground on special-purpose diamond grinding wheel; double-function grinding wheel can realize both coarse and precise grinding functions.

6. The dust generated when grinding the carbide part of the gun drill is hazardous to human body, therefore, the operator shall wear protection glasses and face shield.

We also can provide re-brazing service, make the gun drill used as new.

DRIVERS

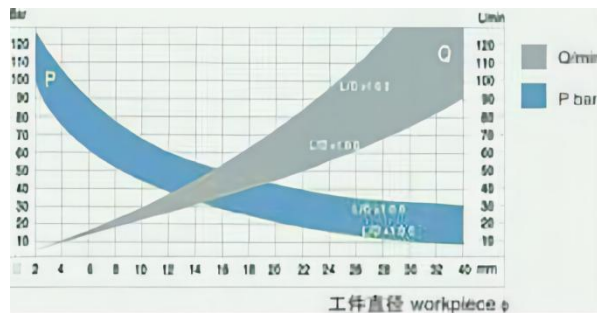
size	diagram	L1	L2	X	drill range
16 x 50		50	58	47.5	2.00-13.00
25 x 70		70	78	34	2.00-20.00
12.7 x 38.1		38.1	58	25.4	8.00-13.00
19.05 x 70		70	78	34	15.00-20.00
25.0 x 70		70	78	34	2.00-20.00
25.4 x 70		70	100	57.1	20.00-25.00
31.75 x 70		70	100	57.1	26.00-30.00
38.1 x 70		70	100	57.1	30.00-40.00
25 x 70		70	100	57.1	2.00-25.00
25 x 70		72	105	34	10.00-25.00
12.7 x 38.1		38.1		25.4	2.00-9.00
19.05 x 70		70		44.4	2.00-15.00
25 x 70		70		44.4	2.00-20.00
10 x 40		42	55	24.3	7.00-10.00
16 x 45		45	65	31	11.00-15.00
16 x 50		52	75	47.5	11.00-15.00
16 x 50		50	58	47.5	2.00-10.00
25.4 x 70		70		57.1	2.00-20.00
31.75 x 70		70		57.1	2.00-25.00
38.1 x 70		70		57.1	2.00-32.00
25 x 70		70		57.1	2.00-25.00

刀柄规格 size	尺寸标注 diagram	L1	L2	X	M	适用钻头规格 drill range
16 x 48		48				2.00 - 12.00
20 x 50		50				2.00 - 15.00
25 x 70		70				2.00 - 20.00
32 x 60		60				2.00 - 26.00
10 x 40		40		20		2.00 - 7.00
12 x 45		45		22.5		2.00 - 8.00
16 x 48		48		24		2.00 - 12.00
20 x 70		50		25		2.00 - 15.00
25 x 56		56		32		2.00 - 20.00
32 x 60		60		36		2.00 - 26.00
40 x 70		70		40		2.00 - 30.00
10 x 40			40		28	
12 x 45	45			33		2.00 - 8.00
16 x 48	48			36		2.00 - 12.00
20 x 70	70			38		2.00 - 15.00
25 x 56	56			44		2.00 - 20.00
32 x 60	60			48		2.00 - 26.00
10 x 40			40		28	
12 x 45		45		33		2.00 - 8.00
16 x 48		48		36		2.00 - 12.00
20 x 50		50		38		2.00 - 15.00
25 x 56		56		44		2.00 - 20.00
16 x 112		112		72	TR16x1.5	2.00 - 12.00
20 x 126		126		81.0	TR20x2	2.00 - 15.00
28 x 126		126		24	TR28x2	2.00 - 24.00
36 x 162		162		25	TR36x2	2.00 - 27.00
10 x 60		60			M6x0.5	2.00 - 7.00
16 x 80		80			M10x1	2.00 - 12.00
25 x 100		100			M16x1.5	2.00 - 20.00
16 x 80		80	100		M10x1	12.00 - 15.00
25 x 100		100	140		M16x1.5	20.00 - 25.00
10 x 68		68		35	M6 x 0.5	2.00 - 7.00
16 x 90		90		37	M10 x 1	2.00 - 12.00
25 x 112		112		45	M16 x 1.5	2.00 - 19.00
10 x 68		68	81	35	M6 x 0.5	7.00 - 10.00
16 x 90		90	110	37	M10 x 1	12.00 - 15.00
25 x 112		112	142	45	M16 x 1.5	20.00 - 25.00

Gun drill usage parameter and problem solving

ISO	Material		Cutting Force	Hardness	cutting speed	gun drill diameter(mm)			
			N/mm ³	HB	V.m/min	0.98-3.00	3.00-6.30	6.00-12.50	12.50-40.50
						Feeding rate, fm mm/r			
P steel	Non alloy	non hardened 0.1-0.25%	2000	90-200	60-120	0.003-0.010	0.005-0.003	0.015-0.055	0.020-0.110
		non hardened 0.25-0.55%	2100		50-120	0.003-0.010	0.005-0.003	0.015-0.055	0.020-0.110
		non hardened 0.55-0.8%	2180	150-250	40-100	0.003-0.010	0.004-0.025	0.010-0.060	0.020-0.100
	Low alloy	non hardened	2100	150-260	40-120	0.003-0.010	0.004-0.030	0.010-0.055	0.020-0.110
		hardened and fixed	2775	220-450	40-120	0.003-0.010	0.004-0.025	0.010-0.060	0.020-0.100
	high alloy	annealing	2500	150-250	40-100	0.003-0.010	0.004-0.025	0.010-0.060	0.020-0.100
		hardened tool steel	3750	250-350	50-100	0.003-0.010	0.006-0.025	0.015-0.060	0.030-0.100
	High cast steel	non alloy	1800	90-225	50-120	0.003-0.010	0.006-0.030	0.015-0.055	0.020-0.110
<5%low alloy(alloy <5%)		2100	150-250	40-100	0.003-0.010	0.004-0.025	0.010-0.050	0.020-0.100	
M stainless steel	rolled/forged	ferrite, martensite, non hardened	2300	150-270	40-90	0.003-0.008	0.004-0.025	0.010-0.040	0.020-0.100
	rolled/forged	austenite	2600	150-275	40-90	0.003-0.008	0.004-0.025	0.010-0.040	0.020-0.100
K cast Iron	malleable cast-iron	ferrite	960	110-145	70-90	0.005-0.010	0.008-0.030	0.020-0.070	0.050-0.190
		pearlite	1100	150-270	60-90	0.005-0.010	0.006-0.030	0.010-0.070	0.030-0.190
	grey cast iron	low tensile strength	1100	150-220	60-90	0.004-0.010	0.006-0.030	0.010-0.070	0.030-0.190
		high tensile strength	1290	200-330	15-90	0.003-0.010	0.003-0.030	0.005-0.070	0.010-0.190
	nodular cast iron	ferrite	1050	125-230	70-90	0.005-0.010	0.008-0.030	0.020-0.070	0.050-0.190
		pearlite	1760	200-300	60-90	0.004-0.010	0.006-0.030	0.010-0.070	0.030-0.190
N non	AL alloy	cast.non aging	750	40-100	65-300	0.005-0.015	0.006-0.040	0.020-0.070	0.030-0.150
ferrous metal	Copper and	pb>1% free cutting alloy pb>1%	700	70-160	65-300	0.005-0.015	0.006-0.040	0.020-0.070	0.030-0.150

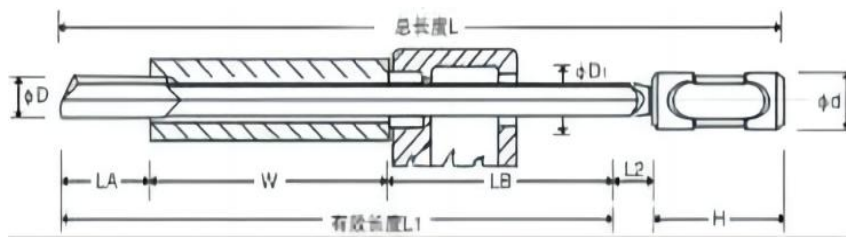
Gun drilling machine cooling lubricant and flow chart



Problem analysis and problem solving

Problem	Reasons
Hole degree of deviation is very bad.	<ul style="list-style-type: none"> ✧ Workpiece not positioned or fixed well. ✧ Drill guide is not suitable, big space between the drill guide and gun drill ✧ No good support for the gun drill shank. ✧ Workpiece structure is not good, such as workpiece wall thickness is too big, and material issue such as not even.
Hole roughness too bad	<ul style="list-style-type: none"> ✧ Main spindle rotating speed, feeding rate is too slow. ✧ Cutting oil is not suitable; Pressure is low, flow is low, oil temperature is too high. ✧ Cutting oil filtering result is not good. ✧ Cutting tool is over worn. ✧ Machine vibrating; workpiece is not fixing steadily.
Hole diameter is larger.	<ul style="list-style-type: none"> ✧ Drill guide is not used well, workpiece positioning and holding are not correct. ✧ Big space between the drill guide and gun drill. ✧ Drill tool tip grinding angle is not correct.
Trumpet hole	<ul style="list-style-type: none"> ✧ Big space between the drill guide and gun drill. ✧ Drill guide rigidity is not enough.
Gun drill life is short or tip is chipping.	<ul style="list-style-type: none"> ✧ Main spindle rotating speed & feeding rate is too low or too high. Have to choose suitable parameters. ✧ Drill tool tip grinding angle is not correct. ✧ Gun drill type is not correct. ✧ Cutting oil is not suitable; Pressure is low, flow is low, oil temperature control is
Chip removal is not good, or not continuous	<ul style="list-style-type: none"> ✧ Cutting oil pressure and flow is too low. ✧ Workpiece chip removal is difficult, we should grind a chip breaker groove. ✧ Feeding rate is too big, spindle rotating is too small.

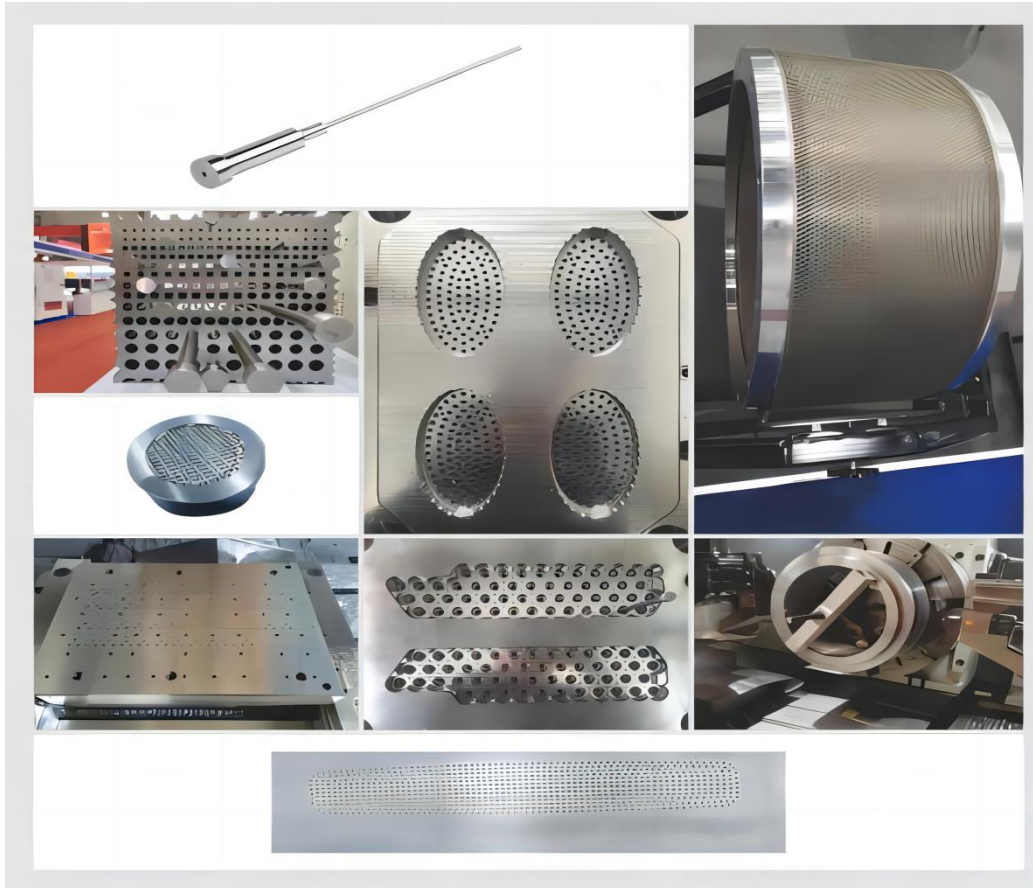
The parameters of the commonly used single blade gun drill



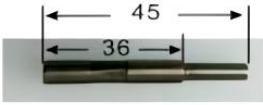





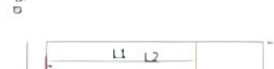








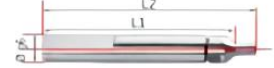

D Gun drill diameter (mm)	Carbide length (mm)	LA Regrindable carbide length (mm)	Tolerance (mm)	D1 Shank (mm)	L Commonly used max length (mm)
3.02	24.23	21	± 1	2.75	1000
4.02	26.25	23	± 1	3.8	1200
5.02	28.64	25	± 1	4.75	1400
6.02	34	30	± 1	5.75	1600
7.02	34	30	± 1	6.7	1600
8.02	38	33	± 1	7.7	1800
9.02	38	33	± 1	8.7	2200
10.02	37.8	34	± 1	9.65	2200
11.02	37.8	34	± 1	10.65	2200
11.52	37.8	32	± 1	11.1	2200
12.02	37.8	33	± 1	11.6	2200
12.52	37.8	33	± 1	12.1	2200
13.02	37.8	32	± 1	12.5	2200
14.02	42.5	36	± 2	13.5	2200
15.02	48.6	38	± 2	14.5	2200
16.02	48.6	38	± 2	15.4	2200
17.02	47.8	36	± 2	16.4	2200
18.02	47.8	34	± 2	17.4	2200
19.02	47.8	34	± 2	18.2	2200
20.02	47.8	33	± 2	19.1	3500
21.02	56.5	44	± 3	20.1	3500
22.02	58.8	45	± 3	21.1	3500
23.02	58.8	45	± 3	22.1	3500
24.02	60	45	± 3	23.1	3500
25.02	61.8	45	± 3	24.1	3500
26.02	62.6	45	± 3	25.1	3500
27.02	62.4	45	± 3	26.1	3500
28.02	63.3	45	± 3	27.1	3500
29.02	64	45	± 3	28.1	3500
30.02	65	45	± 3	29.1	3500

SINGLE FLUTE SOLID CARBIDE GUN DRILL

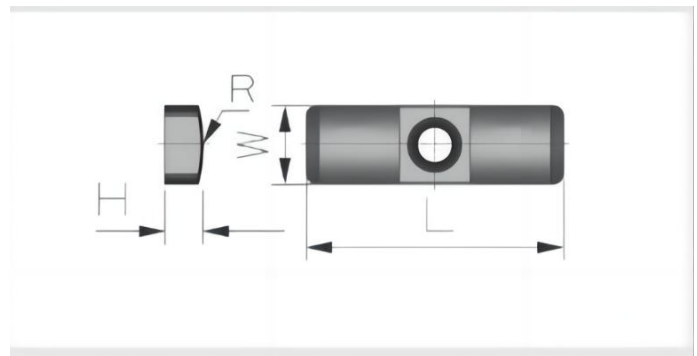
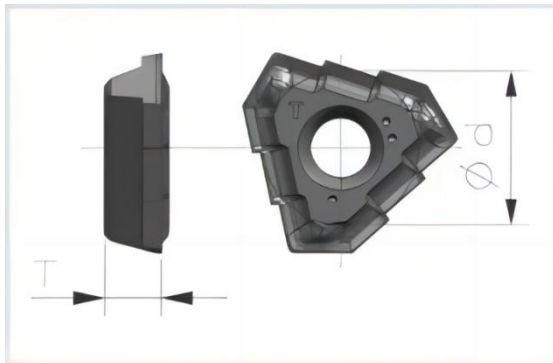
Applications



SINGLE FLUTE SOLID CARBIDE GUN DRILL

6*45		L1	L2		
		36	45		
刀柄规格 size	尺寸标注 diagram	L1	L2	适用钻头规格 drill range	M (螺牙)
4 x 46		34	46	0.9-2.5	
4 x 50		38	50	2.5-5	
6x50		36	50	0.9-5	
10x55		40	55	0.9-7	
10x65		50	65	0.9-7	
10x95		80	95	0.9-7	
10x100		85	100	0.9-7	
10x110		95	110	0.9-7	
10x115		100	115	0.9-7	
10x55		40	55	0.9-6	M6X0.5
10x70		55	70	0.9-6	M6X0.5
10x130		115	130	0.9-6	M6X0.5
10x130		70	130	0.9-6	M10X1.0
10x130		70	130	0.9-6	M10X1.0
16x105		90	105	0.9-6	M10X1.0
16x130		115	130	0.9-6	M10X1.0

INDEXABLE GUNDRILLS



compare with brazed gundrills, indexable gundrills have good performance at chips removal, high feed rate, and easy to change inserts, but the indexable type gundrills have lower accurate, poor performance at cross holes, it also require machines with more stability, normally indexable gundrills use on blind holes, tube sheet, shaft holes etc, no more accuracy requirement processing.

