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# SOLID CARBIDE CUTTING TOOLS

## WORLDIA DESIGN



JIAXING WORLDIA DIAMOND TOOLS CO.,LTD.



## About us

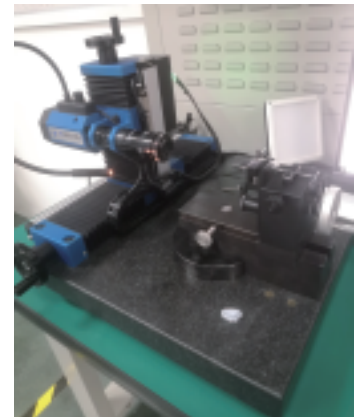
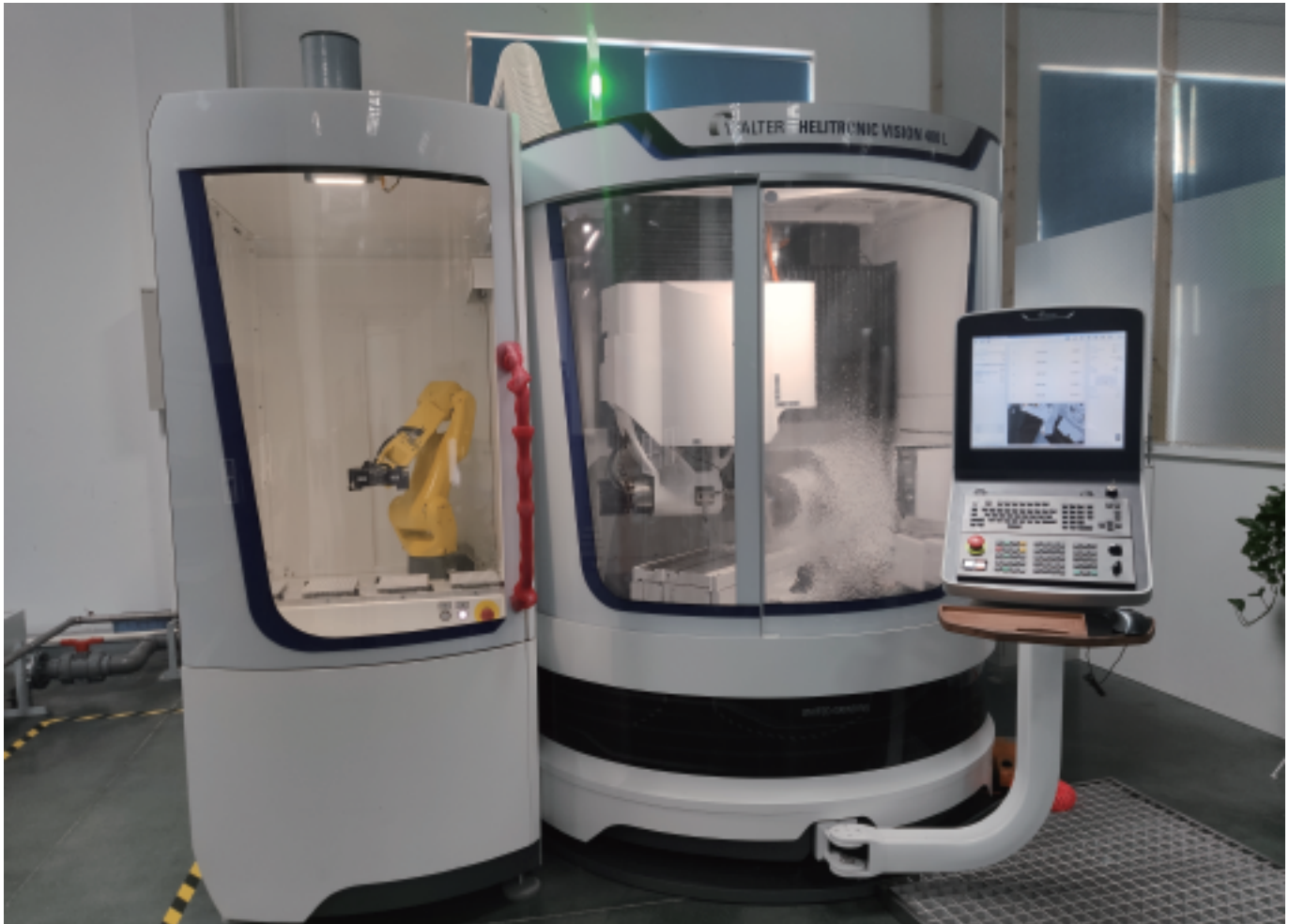
# ENTERPRISE

Jiaxing Worldia Diamond Tools Co., Ltd. was established in 2016 which is located in Jiaxing city, Zhejiang province. The registered capital is 46 million dollars and covers an area of about 40,000 square meters, Jiaxing WORLDIA is the wholly-owned subsidiary of BEIJING WORLDIA DIAMOND TOOLS CO.,LTD (Stock code: 688028)

WORLDIA product catalogue mainly covers high-precision CBN/PCD/CVD cutting tools, solid carbide cutting tools, diamond scribing wheels & related accessories, CVD diamond materials & related product and high-end laser machines etc.

JIAXING WORLDIA DIAMOND TOOLS CO.,LTD.





## Solid carbide cutting tools

We manufacture solid carbide cutting tools with a number of five axis CNC linkage grinders, tool inspectors, HAIMER dynamical balancing machines, ZOLLER tool setting gauge, and other industrial high-end equipment and instruments. We specialized in providing professional services including R&D, manufacturing, regrinding and technical services.

Our purpose is to solve processing problems for customers and enhance their competitiveness. The main product includes solid carbide drills, mills, reamers, profiling cutters, customized tools and related tools regrinding service. The products are mainly used in automotive, mold, 3C, medical and other precision manufacturing industries etc.



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**Aircraft  
composite material**



**Phone holder**



01

## **Tools used to process composite materials**

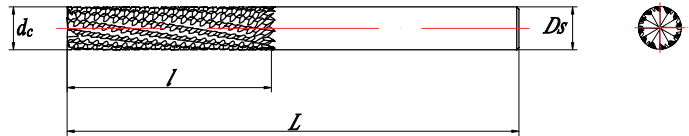
Mainly include diamond-coated Multi-flute End Mill; diamond-coated Cross-edge End mill; diamond-coated Herringbone End Mill, Front Geometry Drill, Three-point Drill, diamond-coated Drilling and Countersink integration tools, etc.



**Composite material cover  
of automotive engine**

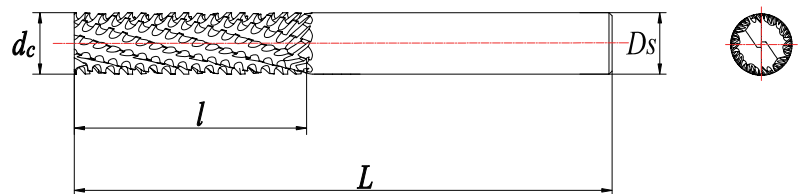


## Multi-flute End Mill



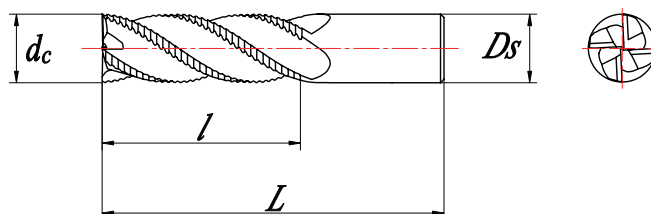
Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Number of blades $Z$	End tooth type	Coating type
4	12	62	4	6	None/End Mill/Drill	None/Diamond
6	18	62	6	8	None/End Mill/Drill	None/Diamond
6.35	18	62	6.35	8	None/End Mill/Drill	None/Diamond
8	25	78	8	10	None/End Mill/Drill	None/Diamond
9.525	25	78	9.525	12	None/End Mill/Drill	None/Diamond
10	25	78	10	12	None/End Mill/Drill	None/Diamond
12	25	78	12	14	None/End Mill/Drill	None/Diamond
12.7	25	78	12.7	14	None/End Mill/Drill	None/Diamond

## Cross-edge End Mill



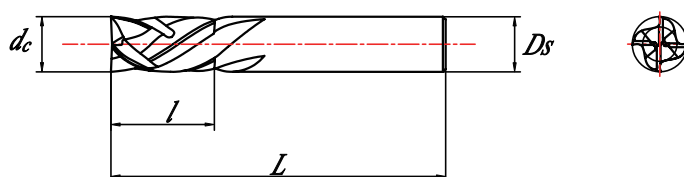
Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	End tooth type	Coating type
4	12	62	4	None/End Mill/Drill	None/Diamond
6	18	62	6	None/End Mill/Drill	None/Diamond
6.35	19.1	50.8	6.35	None/End Mill/Drill	None/Diamond
8	25	78	8	None/End Mill/Drill	None/Diamond
9.525	25	78	9.525	None/End Mill/Drill	None/Diamond
10	25	78	10	None/End Mill/Drill	None/Diamond
12	25	78	12	None/End Mill/Drill	None/Diamond
12.7	25	78	12.7	None/End Mill/Drill	None/Diamond

## Roughing End Mill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
4	12	62	4	None/Diamond
6	18	62	6	None/Diamond
6.35	18	62	6.35	None/Diamond
8	25	78	8	None/Diamond
9.525	25	78	9.525	None/Diamond
10	25	78	10	None/Diamond
12	25	78	12	None/Diamond
12.7	25	78	12.7	None/Diamond

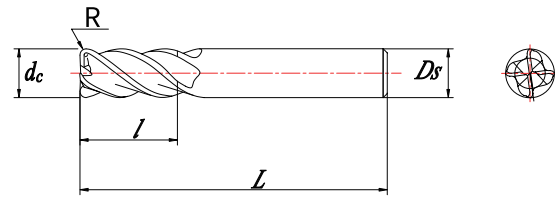
## Herringbone End Mill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Blade length $l(0.7d)$ /mm	Coating type
6	18	62	6	4.2	None/Diamond
6.35	18	62	6.35	4.5	None/Diamond
8	25	78	8	5.6	None/Diamond
9.525	25	78	9.525	6.7	None/Diamond
10	25	78	10	7	None/Diamond
12	25	78	12	8.4	None/Diamond
12.7	25	78	12.7	8.9	None/Diamond



## Carbide End Mill-R



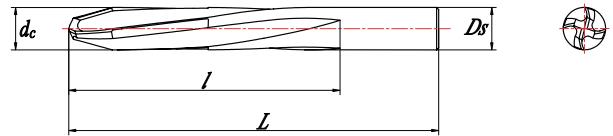
Blade diameter $d_c$ / mm	Fillet $R$	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
4	0.4	12	62	4	None/Diamond
4	0.7	12	62	4	None/Diamond
6	0.4	18	62	6	None/Diamond
6	1	18	62	6	None/Diamond
6.35	0.4	18	62	6.35	None/Diamond
6.35	1	18	62	6.35	None/Diamond
8	0.4	25	78	8	None/Diamond
8	1	25	78	8	None/Diamond
9.525	0.4	25	78	9.525	None/Diamond
9.525	1	25	78	9.525	None/Diamond
10	0.4	25	78	10	None/Diamond
10	1	25	78	10	None/Diamond
12	0.4	25	78	12	None/Diamond
12	1	25	78	12	None/Diamond
12.7	0.4	25	78	12.7	None/Diamond
12.7	1	25	78	12.7	None/Diamond

## Cutting parameters

	CFRP、CFRP/Al、CFRP/Ti						
	Mill method	Mill Slot ( $a_e=dc$ , $a_p \leq dc$ )		Copy Milling ( $a_e \leq 0.5dc$ , $a_p \leq 1.5dc$ )			
		$V_c=120m/min$		$V_c=150m/min$		$V_c=250m/min$	
	$dc(mm)$	$n(rpm)$	$Fr(mm/r)$	$n(rpm)$	$Fr(mm/r)$	$n(rpm)$	$Fr(mm/r)$
CFRP	1	38217	0.035	47771	0.035	79618	0.077
	1.2	31847	0.04	39809	0.04	66348	0.088
	1.5	25478	0.044	31847	0.044	53079	0.097
	1.8	21231	0.044	26539	0.044	44232	0.097
	2	19108	0.045	23885	0.045	39809	0.099
	2.5	15287	0.05	19108	0.05	31847	0.11
	3	12739	0.06	15924	0.06	26539	0.132
	4	9554	0.08	11943	0.08	19904	0.176
	6	6369	0.11	7962	0.11	13270	0.242
	6.35	6018	0.12	7523	0.12	12538	0.264
	8	4777	0.23	5971	0.23	9952	0.506
	9.525	4012	0.31	5015	0.31	8359	0.682
	10	3822	0.35	4777	0.35	7962	0.77
	12	3185	0.44	3981	0.44	6635	0.968
	12.7	3009	0.48	3761	0.48	6269	1.056
		GFRP、GFRP/Al、GFRP/Ti					
		Mill method	Mill Slot ( $a_e=dc$ , $a_p \leq dc$ )		Copy Milling ( $a_e \leq 0.5dc$ , $a_p \leq 1.5dc$ )		High speed milling ( $a_e \leq 0.05dc$ , $a_p \leq 2dc$ )
		$V_c=120m/min$		$V_c=150m/min$		$V_c=250m/min$	
$dc(mm)$		$n(rpm)$	$Fr(mm/r)$	$n(rpm)$	$Fr(mm/r)$	$n(rpm)$	$Fr(mm/r)$
GFRP	1	31847	0.035	38217	0.035	63694	0.077
	1.2	26539	0.04	31847	0.04	53079	0.088
	1.5	21231	0.044	25478	0.044	42463	0.097
	1.8	17693	0.044	21231	0.044	35386	0.097
	2	15924	0.045	19108	0.045	31847	0.099
	2.5	12739	0.05	15287	0.05	25478	0.11
	3	10616	0.06	12739	0.06	21231	0.132
	4	7962	0.08	9554	0.08	15924	0.176
	6	5308	0.11	6369	0.11	10616	0.242
	6.35	5015	0.12	6018	0.12	10031	0.264
	8	3981	0.23	4777	0.23	7962	0.506
	9.525	3344	0.31	4012	0.31	6687	0.682
	10	3185	0.35	3822	0.35	6369	0.77
	12	2654	0.44	3185	0.44	5308	0.968
	12.7	2508	0.48	3009	0.48	5015	1.056

The above cutting parameter table is for reference only. The default is dry cutting conditions. If there is coolant, the cutting parameters can be appropriately increased. The types, structures and on-site cutting conditions of different composite materials require appropriate adjustments to the cutting parameters. Fine finishing usually requires a reduction in feed speed and depth of cut. When the cutting temperature is too high and the composite resin has melted or damaged, the speed should be reduced. When the material is stratified, the feed rate should be reduced.

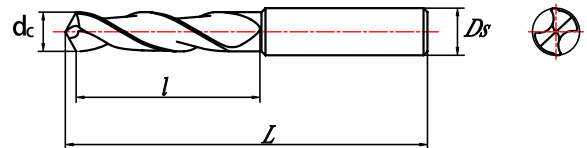
## Front Geometry Drill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3.26	36	76.2	3.26	None/Diamond
3.57	36	76.2	3.57	None/Diamond
3.97	36	76.2	3.97	None/Diamond
4.04	36	76.2	4.04	None/Diamond
4.06	36	76.2	4.06	None/Diamond
4.76	36	76.2	4.76	None/Diamond
4.91	36	76.2	4.91	None/Diamond

Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
5.11	36	76.2	5.11	None/Diamond
5.56	36	76.2	5.56	None/Diamond
5.94	36	76.2	5.94	None/Diamond
6.35	36	76.2	6.35	None/Diamond
7.94	48	101.6	7.94	None/Diamond
9.53	48	101.6	9.53	None/Diamond

## General Twist Drill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	26	65	4	None/Diamond
3.1	26	65	4	None/Diamond
3.2	26	65	4	None/Diamond
3.3	26	65	4	None/Diamond
3.4	30	65	4	None/Diamond
3.5	30	65	4	None/Diamond
3.6	30	65	4	None/Diamond
3.7	30	65	4	None/Diamond
3.8	33	65	4	None/Diamond
3.9	33	65	4	None/Diamond
4	33	65	4	None/Diamond

Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
4.1	33	65	5	None/Diamond
4.2	33	65	5	None/Diamond
4.3	36	80	5	None/Diamond
4.4	36	80	5	None/Diamond
4.5	36	80	5	None/Diamond
4.6	36	80	5	None/Diamond
4.7	36	80	5	None/Diamond
4.8	36	80	5	None/Diamond
4.9	36	80	5	None/Diamond
5	40	80	5	None/Diamond
5.1	40	80	6	None/Diamond



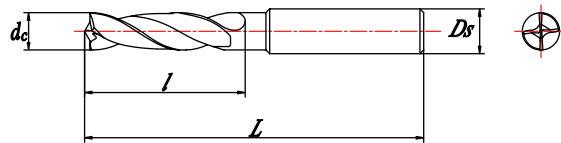
Blade diameter <i>dc</i> / mm	Blade length <i>l</i> /mm	Total length <i>L</i> /mm	Shank diameter <i>Ds</i> / mm	Coating type
5.2	40	80	6	None/Diamond
5.3	40	80	6	None/Diamond
5.4	40	80	6	None/Diamond
5.5	40	80	6	None/Diamond
5.6	40	80	6	None/Diamond
5.7	40	80	6	None/Diamond
5.8	40	80	6	None/Diamond
5.9	40	80	6	None/Diamond
6	40	80	6	None/Diamond
6.1	45	80	7	None/Diamond
6.2	45	80	7	None/Diamond
6.3	45	80	7	None/Diamond
6.4	45	80	7	None/Diamond
6.5	45	80	7	None/Diamond
6.6	45	80	7	None/Diamond
6.7	45	80	7	None/Diamond
6.8	45	80	7	None/Diamond
6.9	45	80	7	None/Diamond
7	45	80	7	None/Diamond
7.1	48	96	8	None/Diamond
7.2	48	96	8	None/Diamond
7.3	48	96	8	None/Diamond
7.4	48	96	8	None/Diamond
7.5	48	96	8	None/Diamond
7.6	48	96	8	None/Diamond
7.7	48	96	8	None/Diamond
7.8	48	96	8	None/Diamond
7.9	48	96	8	None/Diamond
8	48	96	9	None/Diamond
8.1	48	96	9	None/Diamond
8.2	48	96	9	None/Diamond
8.3	48	96	9	None/Diamond
8.4	48	96	9	None/Diamond
8.5	48	96	9	None/Diamond
8.6	48	96	9	None/Diamond
8.7	48	96	9	None/Diamond

Blade diameter <i>dc</i> / mm	Blade length <i>l</i> /mm	Total length <i>L</i> /mm	Shank diameter <i>Ds</i> / mm	Coating type
8.8	48	96	9	None/Diamond
8.9	48	96	9	None/Diamond
9	48	96	9	None/Diamond
9.1	50	100	10	None/Diamond
9.2	50	100	10	None/Diamond
9.3	50	100	10	None/Diamond
9.4	50	100	10	None/Diamond
9.5	50	100	10	None/Diamond
9.6	50	100	10	None/Diamond
9.7	50	100	10	None/Diamond
9.8	50	100	10	None/Diamond
9.9	50	100	10	None/Diamond
10	50	100	10	None/Diamond
10.1	55	105	11	None/Diamond
10.2	55	105	11	None/Diamond
10.3	55	105	11	None/Diamond
10.4	55	105	11	None/Diamond
10.5	55	105	11	None/Diamond
10.6	55	105	11	None/Diamond
10.7	55	105	11	None/Diamond
10.8	55	105	11	None/Diamond
10.9	55	105	11	None/Diamond
11	55	105	11	None/Diamond
11.1	55	105	12	None/Diamond
11.2	55	105	12	None/Diamond
11.3	55	105	12	None/Diamond
11.4	55	105	12	None/Diamond
11.5	55	105	12	None/Diamond
11.6	55	105	12	None/Diamond
11.7	55	105	12	None/Diamond
11.8	55	105	12	None/Diamond
11.9	55	105	12	None/Diamond
12	55	105	12	None/Diamond
12.1	60	108	13	None/Diamond
12.2	60	108	13	None/Diamond
12.3	60	108	13	None/Diamond

Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
12.4	60	108	13	None/Diamond
12.5	60	108	13	None/Diamond
12.6	60	108	13	None/Diamond
12.7	60	108	13	None/Diamond

Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
12.8	60	108	13	None/Diamond
12.9	60	108	13	None/Diamond
13	60	108	13	None/Diamond

## Three-point Drill



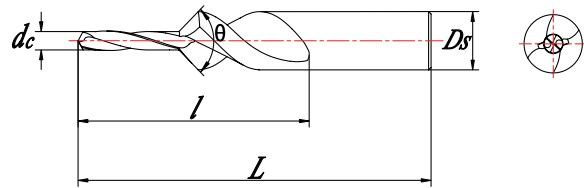
Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	26	65	4	None/Diamond
3.1	26	65	4	None/Diamond
3.2	26	65	4	None/Diamond
3.3	26	65	4	None/Diamond
3.4	30	65	4	None/Diamond
3.5	30	65	4	None/Diamond
3.6	30	65	4	None/Diamond
3.7	30	65	4	None/Diamond
3.8	33	65	4	None/Diamond
3.9	33	65	4	None/Diamond
4	33	65	4	None/Diamond
5.2	40	80	6	None/Diamond
5.3	40	80	6	None/Diamond
5.4	40	80	6	None/Diamond
5.5	40	80	6	None/Diamond
5.6	40	80	6	None/Diamond
5.7	40	80	6	None/Diamond
5.8	40	80	6	None/Diamond
5.9	40	80	6	None/Diamond
6	40	80	6	None/Diamond
6.1	45	80	7	None/Diamond
6.2	45	80	7	None/Diamond

Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
4.1	33	65	5	None/Diamond
4.2	33	65	5	None/Diamond
4.3	36	80	5	None/Diamond
4.4	36	80	5	None/Diamond
4.5	36	80	5	None/Diamond
4.6	36	80	5	None/Diamond
4.7	36	80	5	None/Diamond
4.8	36	80	5	None/Diamond
4.9	36	80	5	None/Diamond
5	40	80	5	None/Diamond
5.1	40	80	6	None/Diamond
8.8	48	96	9	None/Diamond
8.9	48	96	9	None/Diamond
9	48	96	9	None/Diamond
9.1	50	100	10	None/Diamond
9.2	50	100	10	None/Diamond
9.3	50	100	10	None/Diamond
9.4	50	100	10	None/Diamond
9.5	50	100	10	None/Diamond
9.6	50	100	10	None/Diamond
9.7	50	100	10	None/Diamond
9.8	50	100	10	None/Diamond

Blade diameter <i>dc</i> / mm	Blade length <i>l</i> /mm	Total length <i>L</i> /mm	Shank diameter <i>Ds</i> / mm	Coating type	Blade diameter <i>dc</i> / mm	Blade length <i>l</i> /mm	Total length <i>L</i> /mm	Shank diameter <i>Ds</i> / mm	Coating type
6.3	45	80	7	None/Diamond	9.9	50	100	10	None/Diamond
6.4	45	80	7	None/Diamond	10	50	100	10	None/Diamond
6.5	45	80	7	None/Diamond	10.1	55	105	11	None/Diamond
6.6	45	80	7	None/Diamond	10.2	55	105	11	None/Diamond
6.7	45	80	7	None/Diamond	10.3	55	105	11	None/Diamond
6.8	45	80	7	None/Diamond	10.4	55	105	11	None/Diamond
6.9	45	80	7	None/Diamond	10.5	55	105	11	None/Diamond
7	45	80	7	None/Diamond	10.6	55	105	11	None/Diamond
7.1	48	96	8	None/Diamond	10.7	55	105	11	None/Diamond
7.2	48	96	8	None/Diamond	10.8	55	105	11	None/Diamond
7.3	48	96	8	None/Diamond	10.9	55	105	11	None/Diamond
7.4	48	96	8	None/Diamond	11	55	105	11	None/Diamond
7.5	48	96	8	None/Diamond	11.1	55	105	12	None/Diamond
7.6	48	96	8	None/Diamond	11.2	55	105	12	None/Diamond
7.7	48	96	8	None/Diamond	11.3	55	105	12	None/Diamond
7.8	48	96	8	None/Diamond	11.4	55	105	12	None/Diamond
7.9	48	96	8	None/Diamond	11.5	55	105	12	None/Diamond
8	48	96	9	None/Diamond	11.6	55	105	12	None/Diamond
8.1	48	96	9	None/Diamond	11.7	55	105	12	None/Diamond
8.2	48	96	9	None/Diamond	11.8	55	105	12	None/Diamond
8.3	48	96	9	None/Diamond	11.9	55	105	12	None/Diamond
8.4	48	96	9	None/Diamond	12	55	105	12	None/Diamond
8.5	48	96	9	None/Diamond	12.1	60	108	13	None/Diamond
8.6	48	96	9	None/Diamond	12.2	60	108	13	None/Diamond
8.7	48	96	9	None/Diamond	12.3	60	108	13	None/Diamond
12.4	60	108	13	None/Diamond	12.8	60	108	13	None/Diamond
12.5	60	108	13	None/Diamond	12.9	60	108	13	None/Diamond
12.6	60	108	13	None/Diamond	13	60	108	13	None/Diamond
12.7	60	108	13	None/Diamond					



# Drilling and Countersink integration



Blade diameter dc / mm	Angle $\theta$	Blade length l/mm	Total length L/mm	Shank diameter Ds / mm	Coating type
3.6	90°	14	95	8	None/Diamond
3.6	120°	5	79	10	None/Diamond
4.1	90°	5	79	10	None/Diamond
4.1	90°	8	79	10	None/Diamond
4.1	90°	10	79	10	None/Diamond
4.1	100°	6	79	10	None/Diamond
4.1	100°	18	95	8	None/Diamond
4.1	120°	7	79	10	None/Diamond
5	120°	8	79	10	None/Diamond
5.05	100°	18	85	10	None/Diamond
5.1	100°	18	95	8	None/Diamond

Blade diameter dc / mm	Angle $\theta$	Blade length l/mm	Total length L/mm	Shank diameter Ds / mm	Coating type
4.15	100°	11	100	10	None/Diamond
4.2	100°	6	79	10	None/Diamond
4.2	100°	7	79	10	None/Diamond
4.2	130°	6	79	10	None/Diamond
4.86	100°	18	100	10	None/Diamond
5	100°	8	79	10	None/Diamond
5	100°	10	79	10	None/Diamond
5	100°	25	90	10	None/Diamond
5.1	130°	6	79	10	None/Diamond
6.1	100°	17	102	10	None/Diamond

Special size and British system Drill can be customized according to customer needs;  
 Drilling and countersinking are completed at one time, greatly improving the efficiency of hole making;  
 Can be used for hole making equipment such as ADU, CNC, robotic drilling and riveting systems;  
 Straight shank or threaded shank can be used;  
 The grooves of the drill and countersink can be designed with internal cooling for air cooling or minimal lubrication;  
 It can be used to process aluminum, composite materials or composite/aluminum, composite/composite, aluminum/aluminum, composite/titanium alloy and other laminated holes.

## Cutting Parameters

Work Material	CFRP、CFRP/Al		
Outside Diameter dc/ (mm)	Cutting Speed Vc/ (m/min)	Rotating Speed n/ (rpm)	Feed Rate Fr/ (mm/r)
3	60~120	9600	0.03~0.05
4		7300	
5		5800	
6		4900	0.05~0.1
7		4200	
8		3700	
9		3300	
10		3000	
11		2700	
12		2500	
13		2300	

## Other Special Tools



Threaded Shank Front Geometry Drill



Threaded Shank General Drill

According to customer needs, we can use our proprietary tool research and development technology experience to carry out unique research and development in terms of tool material selection, tool geometry design, passivation polishing technology, coating technology, etc. Develop special composite material processing tools that meet customer requirements.

Blades/Impellers/Casings  
**AVIATION PARTS AND  
COMPONENTS**

# 02

## **Tools for aeroengine parts**

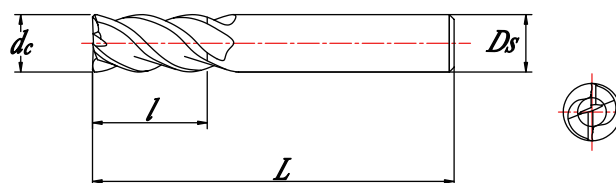
It mainly includes parts such as blades, impellers, casings, and seals on aero engines. The materials are mainly titanium alloy, high temperature alloy, stainless steel, aluminum alloy, etc.

Processing tools mainly include flat-end milling cutters, round-nose milling cutters, ball-end milling cutters, taper ball-end milling cutters, and other drills and reamers.



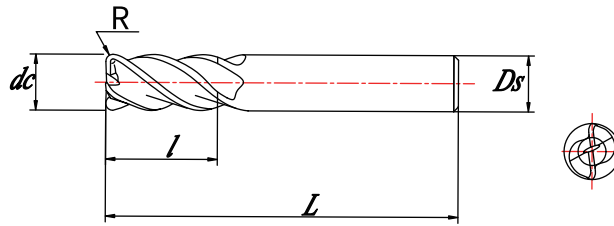


## 2 Flute Carbide End Mill



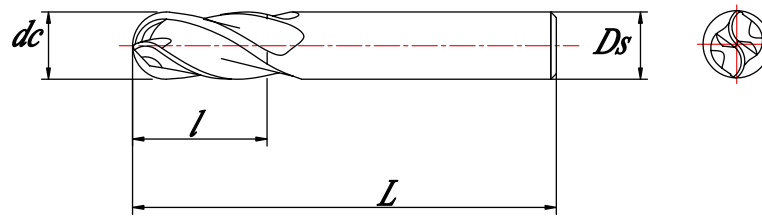
Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	NOTE
3	6	50	3	
3	9	60	6	
3	12	50	3	
3	25	80	3	
4	8	50	4	
4	12	70	6	
4	14	50	4	
4	25	75	4	
5	10	50	6	
5	16	50	6	
5	25	75	6	
6	12	50	6	
6	15	80	6	
6	19	60	6	
6	25	63	6	
8	12	50	8	
8	20	63	8	
8	20	89	8	
8	25	75	8	
10	16	60	10	
10	22	75	10	
10	25	105	10	
10	38	100	10	
12	19	63	12	
12	25	75	12	
12	30	110	12	
12	50	100	12	
12	75	150	12	

## 2 Flute Carbide End Mill-R



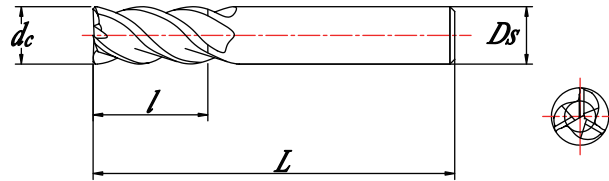
Blade diameter $d_c$ / mm	Fillet $R$	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	NOTE
6	0.25	19	63	6	
6	0.5	19	63	6	
6	0.75	19	63	6	
6	1	19	63	6	
8	0.5	20	63	8	
8	0.75	20	63	8	
8	1	20	63	8	
8	1.5	20	63	8	
8	2	20	63	8	
10	0.5	22	80	8	
10	1	22	80	9	
10	1.5	22	80	10	
10	2	22	80	10	
12	0.5	25	80	10	
12	1	25	80	10	
12	1.5	25	80	10	
12	2	25	80	12	

## 2 Flute Carbide Ball End Mill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	NOTE
3	6	50	3	
3	9	60	6	
3	12	50	3	
3	25	80	3	
4	8	50	4	
4	12	70	6	
4	14	50	4	
4	25	75	4	
5	10	50	6	
5	16	50	6	
5	25	75	6	
6	12	50	6	
6	15	80	6	
6	19	60	6	
6	25	63	6	
8	12	50	8	
8	20	63	8	
8	20	89	8	
8	25	75	8	
10	16	60	10	
10	22	75	10	
10	25	105	10	
10	38	100	10	
12	19	63	12	
12	25	75	12	
12	30	110	12	
12	50	100	12	
12	75	150	12	

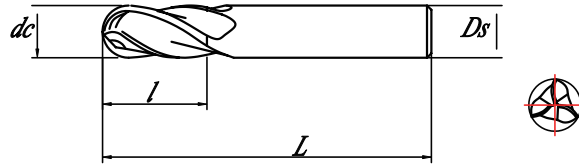
### 3 Flute Carbide End Mill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	NOTE
3	6	50	3	
3	9	60	6	
3	12	50	3	
3	25	80	3	
4	8	50	4	
4	12	70	6	
4	14	50	4	
4	25	75	4	
5	10	50	6	
5	16	50	6	
5	25	75	6	
6	12	50	6	
6	15	80	6	
6	19	60	6	
6	25	63	6	
8	12	50	8	
8	20	63	8	
8	20	89	8	
8	25	75	8	
10	16	60	10	
10	22	75	10	
10	25	105	10	
10	38	100	10	
12	19	63	12	
12	25	75	12	
12	30	110	12	
12	50	100	12	
12	75	150	12	

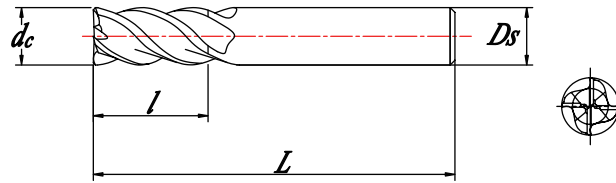


## 3 Flute Carbide Ball End Mill



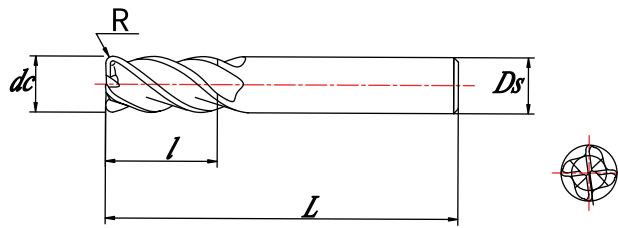
Blade diameter $d_c$ / mm	Blade length $l$ / mm	Total length $L$ / mm	Shank diameter $D_s$ / mm	NOTE
3	6	50	3	
3	9	60	6	
3	12	50	3	
3	25	80	3	
4	8	50	4	
4	12	70	6	
4	14	50	4	
4	25	75	4	
5	10	50	6	
5	16	50	6	
5	25	75	6	
6	12	50	6	
6	15	80	6	
6	19	60	6	
6	25	63	6	
8	12	50	8	
8	20	63	8	
8	20	89	8	
8	25	75	8	
10	16	60	10	
10	22	75	10	
10	25	105	10	
10	38	100	10	
12	19	63	12	
12	25	75	12	
12	30	110	12	
12	50	100	12	
12	75	150	12	

## 4 Flute Carbide End Mill



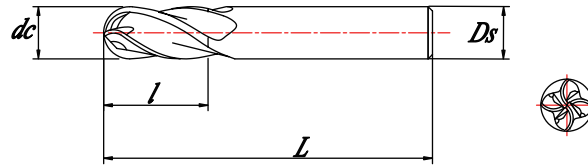
Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	NOTE
3	6	50	3	
3	9	60	6	
3	12	50	3	
3	25	80	3	
4	8	50	4	
4	12	70	6	
4	14	50	4	
4	25	75	4	
5	10	50	6	
5	16	50	6	
5	25	75	6	
6	12	50	6	
6	15	80	6	
6	19	60	6	
6	25	63	6	
8	12	50	8	
8	20	63	8	
8	20	89	8	
8	25	75	8	
10	16	60	10	
10	22	75	10	
10	25	105	10	
10	38	100	10	
12	19	63	12	
12	25	75	12	
12	30	110	12	
12	50	100	12	
12	75	150	12	

## 4 Flute Carbide End Mill-R

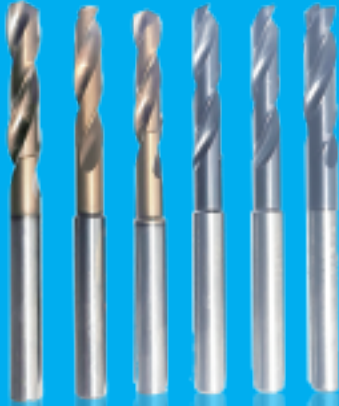


Blade diameter $d_c$ / mm	Fillet $R$	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	NOTE
6	0.25	19	63	6	
6	0.5	19	63	6	
6	0.75	19	63	6	
6	1	19	63	6	
8	0.5	20	63	8	
8	0.75	20	63	8	
8	1	20	63	8	
8	1.5	20	63	8	
8	2	20	63	8	
10	0.5	22	80	8	
10	1	22	80	9	
10	1.5	22	80	10	
10	2	22	80	10	
12	0.5	25	80	10	
12	1	25	80	10	
12	1.5	25	80	10	
12	2	25	80	12	

## 4 Flute Carbide Ball End Mill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	NOTE
3	6	50	3	
3	9	60	6	
3	12	50	3	
3	25	80	3	
4	8	50	4	
4	12	70	6	
4	14	50	4	
4	25	75	4	
5	10	50	6	
5	16	50	6	
5	25	75	6	
6	12	50	6	
6	15	80	6	
6	19	60	6	
6	25	63	6	
8	12	50	8	
8	20	63	8	
8	20	89	8	
8	25	75	8	
10	16	60	10	
10	22	75	10	
10	25	105	10	
10	38	100	10	
12	19	63	12	
12	25	75	12	
12	30	110	12	
12	50	100	12	
12	75	150	12	



Including automobile engine cylinder blocks, cylinder heads, steering gears, connecting rods, steering knuckles and other parts. The materials involve ductile iron, gray cast iron, steel, aluminum alloy, etc. According to customer needs, we can use our proprietary tool development technology experience to develop special tools that meet customer requirements in terms of tool material selection, tool geometric design, passivation and polishing technology, coating technology, etc. The main processing tools include ordinary twist drills, shaped step drills, shaped reamers, corresponding drills and reamers with internal cooling function and other flat end milling cutters, round end milling cutters and ball end milling cutters. Please refer to page 36-40 for details.

# 03

## Special tools for automotive parts

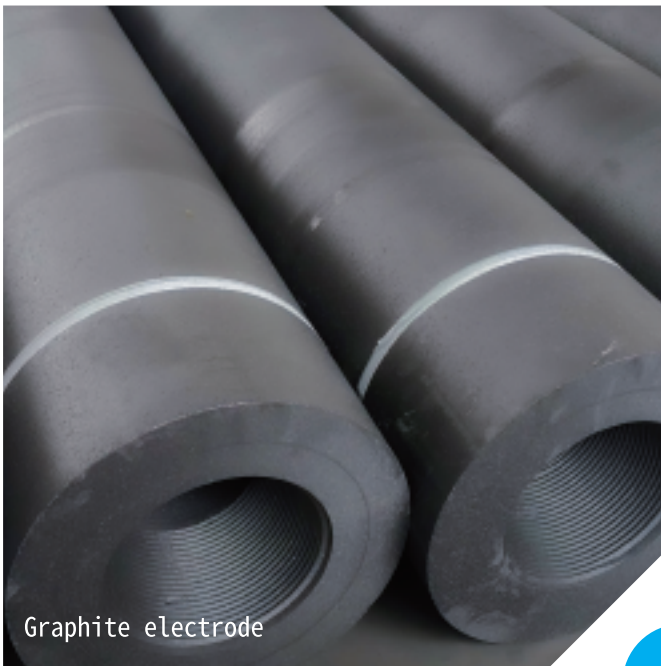




# 04

## Tools for graphite

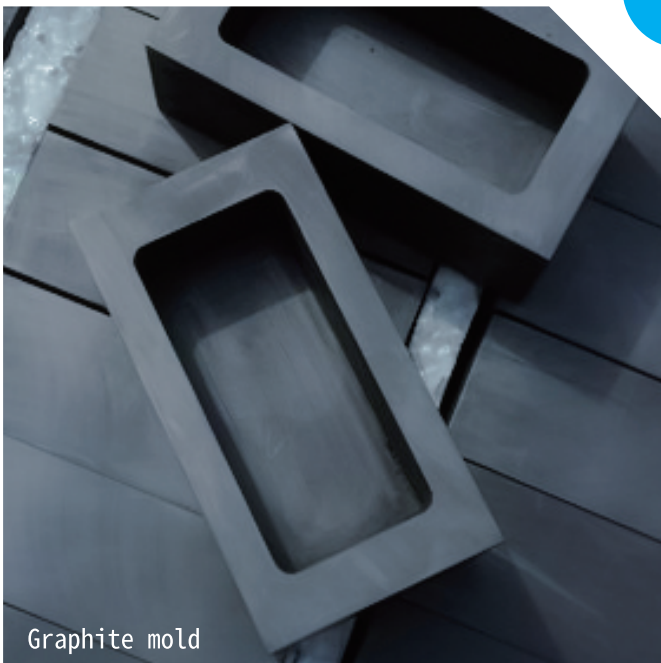
Mainly include diamond coated tools for processing graphite molds and graphite electrodes.



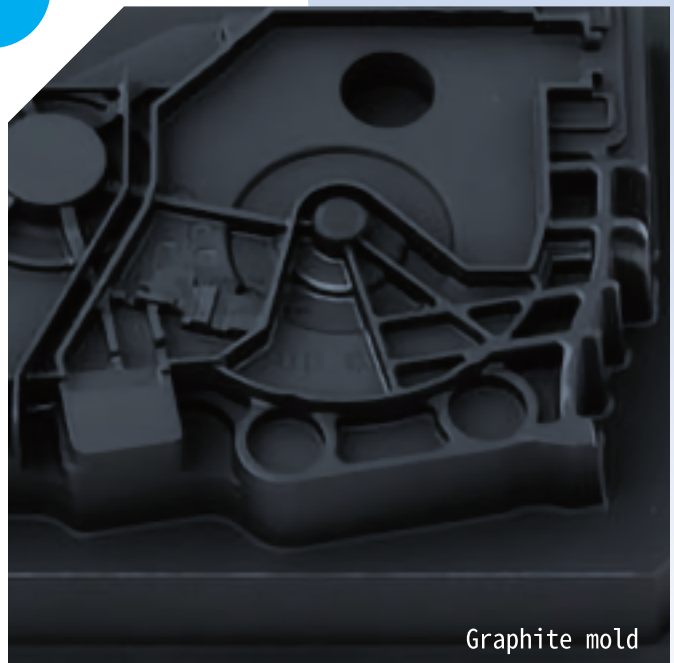
Graphite electrode



Diamond coated tools

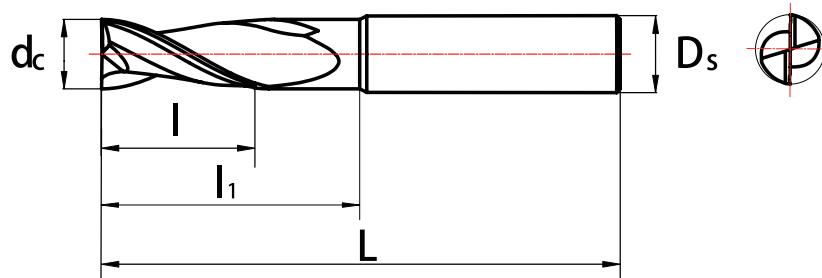


Graphite mold



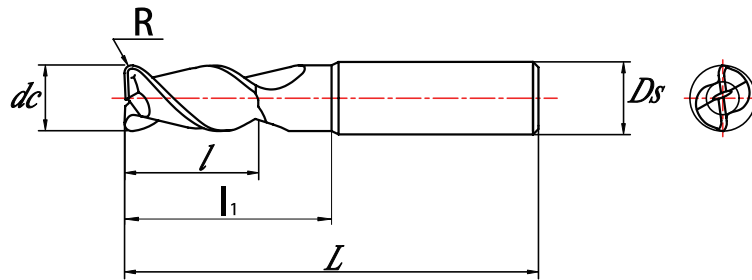
Graphite mold

## 2 Flute Carbide End Mill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Effective length $l_1$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	9	/	50	6	Diamond
3	12	/	80	4	Diamond
3	12	20	80	4	Diamond
3	12	25	80	4	Diamond
3	12	30	80	4	Diamond
3	12	40	80	4	Diamond
4	12	/	50	6	Diamond
4	16	/	80	4	Diamond
5	15	/	64	6	Diamond
5	20	/	105	6	Diamond
6	18	/	64	6	Diamond
6	25	/	105	6	Diamond
6	25	/	150	6	Diamond
8	24	/	75	8	Diamond
8	25	40	150	8	Diamond
10	25	/	81	10	Diamond
10	25	50	160	10	Diamond
12	25	/	81	12	Diamond
12	25	60	160	12	Diamond

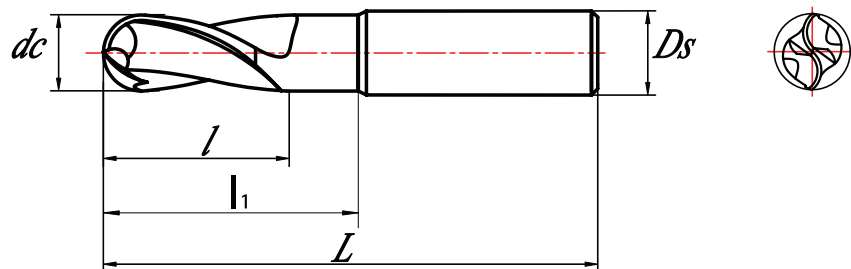
## 2 Flute Carbide End Mill



Blade diameter $d_c$ / mm	Fillet radius $R$	Blade length $l$ /mm	Effective length $l_1$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	0.3	4	/	82	4	Diamond
3	0.3	4	10	82	4	Diamond
3	0.3	4	20	82	4	Diamond
3	0.3	4	30	82	4	Diamond
3	0.3	4	40	82	4	Diamond
3	0.5	4	/	82	4	Diamond
3	0.5	4	10	82	4	Diamond
3	0.5	4	20	82	4	Diamond
3	0.5	4	30	82	4	Diamond
3	0.5	4	40	82	4	Diamond
3	1	4	/	82	4	Diamond
3	1	4	10	82	4	Diamond
3	1	4	20	82	4	Diamond
3	1	4	30	82	4	Diamond
3	1	4	40	82	4	Diamond
4	0.2	5	/	82	4	Diamond
4	0.2	5	15	82	4	Diamond
4	0.2	5	25	82	4	Diamond
4	0.2	5	40	82	4	Diamond
4	0.5	5	/	82	4	Diamond
4	0.5	5	15	82	4	Diamond
4	0.5	5	25	82	4	Diamond
4	0.5	5	40	82	4	Diamond
4	1	5	/	82	4	Diamond
4	1	5	15	82	4	Diamond
4	1	5	25	82	4	Diamond
4	1	5	40	82	4	Diamond
5	0.2	6	/	105	6	Diamond

Blade diameter $d_c$ / mm	Fillet radius $R$	Blade length $l$ /mm	Effective length $l_1$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
5	0.2	6	15	105	6	Diamond
5	0.2	6	30	105	6	Diamond
5	0.2	6	50	105	6	Diamond
5	0.5	6	/	105	6	Diamond
5	0.5	6	15	105	6	Diamond
5	0.5	6	30	105	6	Diamond
5	0.5	6	50	105	6	Diamond
6	0.2	7	/	105	6	Diamond
6	0.2	7	20	105	6	Diamond
6	0.2	7	30	105	6	Diamond
6	0.2	7	50	105	6	Diamond
6	0.5	7	/	105	6	Diamond
6	0.5	7	20	105	6	Diamond
6	0.5	7	30	105	6	Diamond
6	0.5	7	50	105	6	Diamond
6	1	7	/	105	6	Diamond
6	1	7	20	105	6	Diamond
6	1	7	30	105	6	Diamond
6	1	7	50	105	6	Diamond

## 2 Flute Carbide Ball End Mill

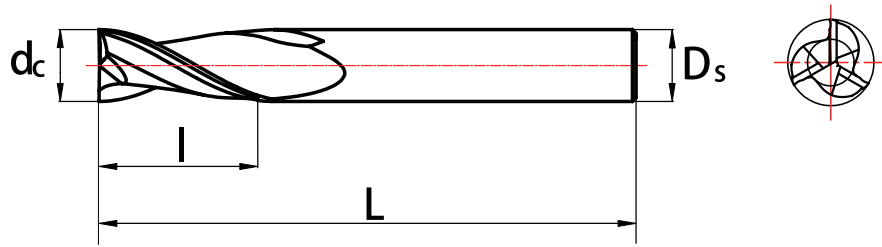


Blade diameter $d_c$ / mm	Blade length $l$ /mm	Effective length $l_1$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	8	15	105	3	Diamond
3	8	/	62	4	Diamond
3	8	15	105	4	Diamond
3	8	20	105	4	Diamond
3	8	25	105	4	Diamond
3	8	30	105	4	Diamond

## Tools for graphite

Blade diameter $d_c$ / mm	Blade length $l$ / mm	Effective length $l_i$ / mm	Total length $L$ / mm	Shank diameter $D_s$ / mm	Coating type
3	8	35	105	4	Diamond
3	8	40	105	4	Diamond
3	8	50	105	4	Diamond
3	8	60	105	4	Diamond
4	16	/	62	4	Diamond
4	16	/	82	4	Diamond
4	16	30	82	4	Diamond
4	16	/	105	4	Diamond
4	16	40	105	4	Diamond
4	16	/	135	4	Diamond
4	16	40	135	4	Diamond
4	16	/	160	4	Diamond
4	16	50	160	4	Diamond
5	16	20	105	6	Diamond
6	16	25	82	6	Diamond
6	16	25	105	6	Diamond
6	16	40	105	6	Diamond
6	16	30	160	6	Diamond
6	16	50	160	6	Diamond
8	20	30	82	8	Diamond
8	20	30	105	8	Diamond
8	20	40	105	8	Diamond
8	20	50	160	8	Diamond
8	20	40	205	8	Diamond
10	22	40	82	10	Diamond
10	22	35	105	10	Diamond
10	22	50	105	10	Diamond
10	22	60	160	10	Diamond
10	22	50	200	10	Diamond
12	25	50	105	12	Diamond
12	25	50	160	12	Diamond
12	25	60	205	12	Diamond

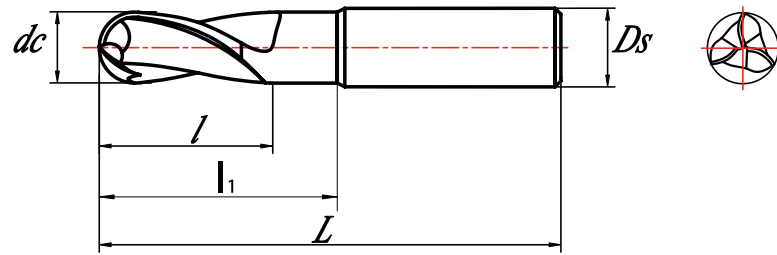
## 3 Flute Carbide End Mill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	9	54	6	Diamond
3	15	64	3	Diamond
3	15	64	4	Diamond
4	12	54	6	Diamond
4	20	82	4	Diamond
6	18	64	6	Diamond
6	25	105	6	Diamond
6	25	150	6	Diamond
8	24	75	8	Diamond
8	35	105	8	Diamond
8	35	162	8	Diamond
10	25	81	10	Diamond
10	40	105	10	Diamond
10	50	162	10	Diamond
12	25	81	12	Diamond
12	45	105	12	Diamond
12	55	162	12	Diamond

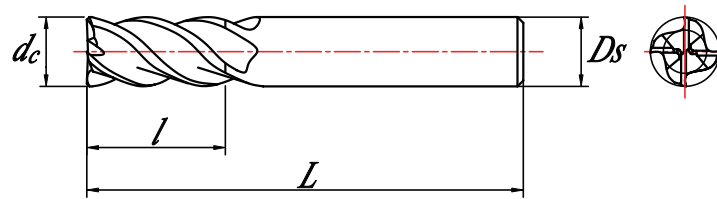


### 3 Flute Carbide Ball End Mill



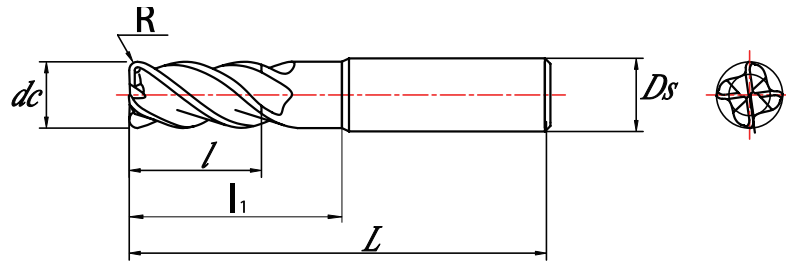
Blade diameter $d_c$ / mm	Blade length $l$ / mm	Effective length $l_1$ / mm	Total length $L$ / mm	Shank diameter $D_s$ / mm	Coating type
3	8	15	105	3	Diamond
3	8	/	62	4	Diamond
3	8	15	105	4	Diamond
3	8	20	105	4	Diamond
3	8	30	105	4	Diamond
3	8	40	105	4	Diamond
3	8	50	105	4	Diamond
4	16	/	82	4	Diamond
4	16	30	82	4	Diamond
4	16	/	105	4	Diamond
4	16	40	105	4	Diamond
4	16	/	135	4	Diamond
4	16	40	135	4	Diamond
6	16	25	105	6	Diamond
6	16	40	105	6	Diamond
6	16	30	160	6	Diamond
6	16	50	160	6	Diamond
8	20	30	82	8	Diamond
8	20	30	105	8	Diamond
8	20	40	105	8	Diamond
8	20	50	160	8	Diamond
8	20	40	205	8	Diamond
10	22	40	82	10	Diamond
10	22	35	105	10	Diamond
10	22	50	105	10	Diamond
10	22	60	160	10	Diamond
10	22	50	200	10	Diamond
12	25	50	105	12	Diamond
12	25	50	160	12	Diamond
12	25	60	205	12	Diamond

## 4 Flute Carbide End Mill



Blade diameter $d_c$ / mm	Blade length $l$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	9	54	6	Diamond
3	15	64	3	Diamond
3	15	64	4	Diamond
4	12	54	6	Diamond
4	20	82	4	Diamond
6	18	64	6	Diamond
6	25	105	6	Diamond
6	25	150	6	Diamond
8	24	75	8	Diamond
8	35	105	8	Diamond
8	35	162	8	Diamond
10	25	81	10	Diamond
10	40	105	10	Diamond
10	50	162	10	Diamond
12	25	81	12	Diamond
12	45	105	12	Diamond
12	55	162	12	Diamond

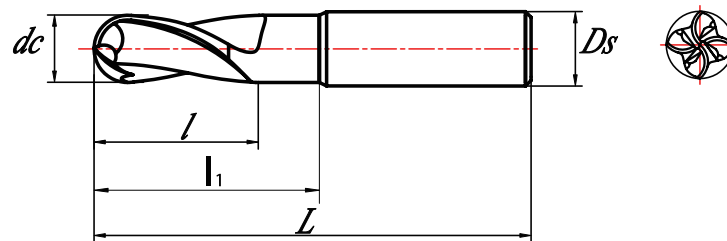
## 4 Flute Carbide End Mill-R



Blade diameter $d_c$ / mm	Fillet radius $R$	Blade length $l$ /mm	Effective length $l_1$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	0.3	4	/	82	4	Diamond
3	0.3	4	10	82	4	Diamond
3	0.3	4	20	82	4	Diamond
3	0.3	4	30	82	4	Diamond
3	0.3	4	40	82	4	Diamond
3	0.5	4	/	82	4	Diamond
3	0.5	4	10	82	4	Diamond
3	0.5	4	20	82	4	Diamond
3	0.5	4	30	82	4	Diamond
3	0.5	4	40	82	4	Diamond
3	1	4	/	82	4	Diamond
3	1	4	10	82	4	Diamond
3	1	4	20	82	4	Diamond
3	1	4	30	82	4	Diamond
3	1	4	40	82	4	Diamond
4	0.3	6	20	105	4	Diamond
4	0.5	6	20	105	4	Diamond
4	1	6	20	105	4	Diamond
6	0.3	9	25	105	6	Diamond
6	0.5	9	25	105	6	Diamond
6	0.5	9	30	150	6	Diamond
6	1	9	25	105	6	Diamond
6	1	9	30	150	6	Diamond
8	0.3	12	30	105	8	Diamond
8	0.5	12	30	105	8	Diamond
8	0.5	12	40	150	8	Diamond
8	1	12	30	105	8	Diamond
8	1	12	40	150	8	Diamond

Blade diameter $d_c$ / mm	Fillet radius $R$	Blade length $l$ /mm	Effective length $l_1$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
10	0.5	15	35	105	10	Diamond
10	0.5	15	45	162	10	Diamond
10	1	15	35	105	10	Diamond
10	1	15	45	162	10	Diamond
12	0.5	18	40	105	12	Diamond
12	0.5	18	45	162	12	Diamond
12	1	18	40	105	12	Diamond
12	1	18	45	162	12	Diamond

## 4 Flute Carbide Ball End Mill

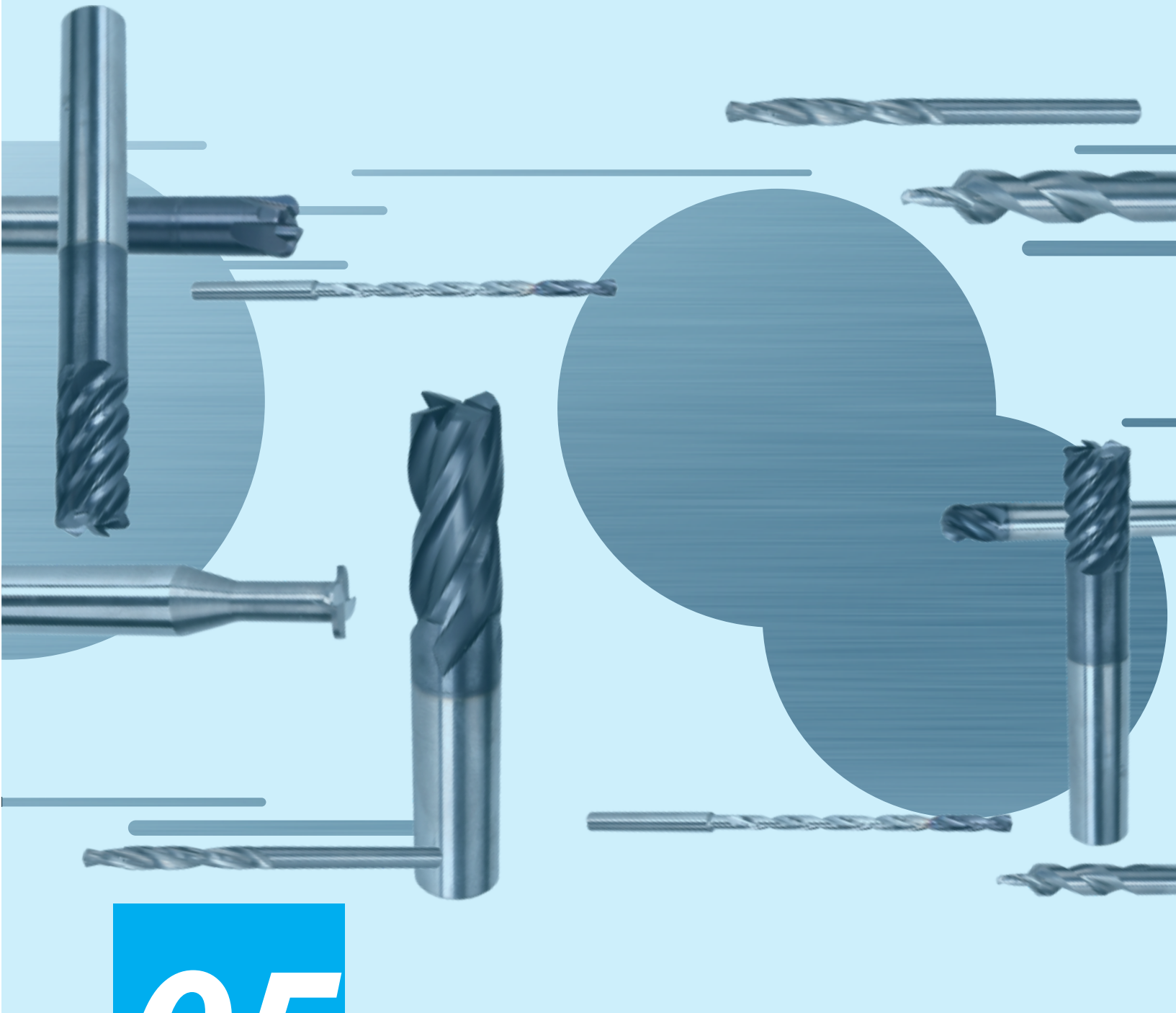


Blade diameter $d_c$ / mm	Blade length $l$ /mm	Effective length $l_1$ /mm	Total length $L$ /mm	Shank diameter $D_s$ / mm	Coating type
3	8	15	105	3	Diamond
3	8	/	62	4	Diamond
3	8	15	105	4	Diamond
3	8	20	105	4	Diamond
3	8	30	105	4	Diamond
3	8	40	105	4	Diamond
3	8	50	105	4	Diamond
4	16	/	82	4	Diamond
4	16	30	82	4	Diamond
4	16	/	105	4	Diamond
4	16	40	105	4	Diamond
4	16	/	135	4	Diamond
4	16	40	135	4	Diamond
6	16	25	105	6	Diamond
6	16	40	105	6	Diamond
6	16	30	160	6	Diamond
6	16	50	160	6	Diamond

## Tools for graphite

Blade diameter <i>d<sub>c</sub></i> / mm	Blade length <i>l</i> /mm	Effective length <i>l<sub>1</sub></i> /mm	Total length <i>L</i> /mm	Shank diameter <i>D<sub>s</sub></i> / mm	Coating type
38	20	30	82	8	Diamond
8	20	30	105	8	Diamond
8	20	40	105	8	Diamond
8	20	50	160	8	Diamond
8	20	40	205	8	Diamond
10	22	40	82	10	Diamond
10	22	35	105	10	Diamond
10	22	50	105	10	Diamond
10	22	60	160	10	Diamond
10	22	50	200	10	Diamond
12	25	50	105	12	Diamond
12	25	50	160	12	Diamond
12	25	60	205	12	Diamond





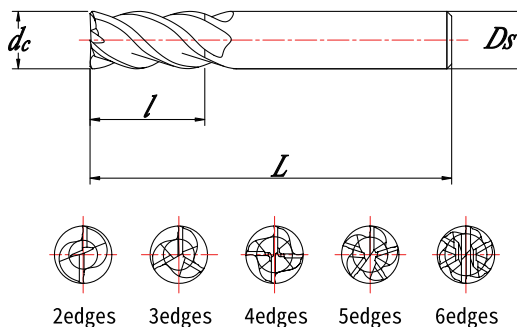
# 05

## Other types of special tools

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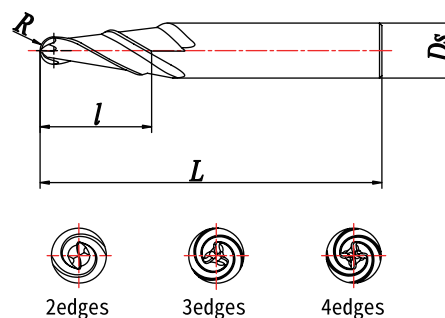
According to customer needs, we can use our proprietary tool research and development technology experience to conduct unique research and development in terms of tool material selection, tool geometry design, passivation polishing technology, coating technology, etc. Developed solid carbide non-standard tools that meet customer requirements, including flat-end milling cutters, round-nose milling cutters, ball-end milling cutters, taper ball-end milling cutters, rough milling cutters, drills, reamers, etc.

## Carbide End Mill



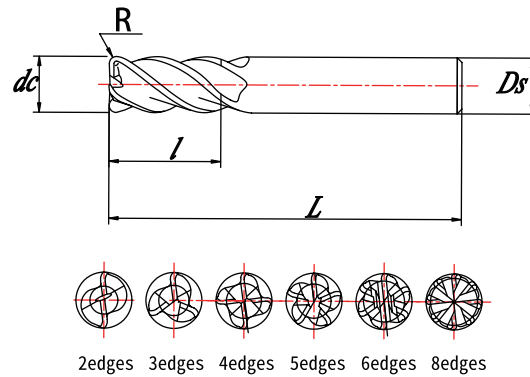
materials suitable for processing	Carbon steel, stainless steel, cast iron, titanium alloy, aluminum alloy, high temperature alloy, non-metallic materials, etc.
Milling form	Side milling, shoulder milling, cavity milling, etc.
Blade diameter $d_c$ (mm)	3~32
Blade length $l$ (mm)	5~100
Total length $L$ (mm)	38~200
Shank diameter $D_s$ (mm)	4~32
Handle form	Cylindrical shank, side fixed shank
Number of blades	2 edge, 3 edge, 4 edge, 5 edge, 6 edge, 8 edge
coating	TiN, TiAlN, AlCrN, AlTiN-based, DLC, diamond coating, etc.
other	The blade can be designed to shrink, avoid air, taper, etc.

## Taper ball end mill



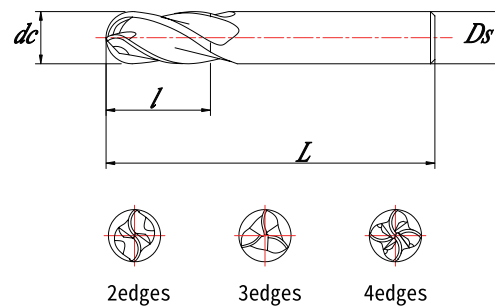
Materials suitable for processing	Stainless steel, titanium alloy, aluminum alloy, high temperature alloy
Milling form	Side milling, end milling, etc.
R value (mm)	0.8~6
Taper (half side)	1°~9°
Blade length $l$ (mm)	10~100
Total length $L$ (mm)	50~150
Shank diameter $D_s$ (mm)	6~20
Handle form	Cylindrical shank
Number of blades	2-edge, 3-edge, 4-edge
coating	TiN, TiAlN, AlCrN, AlTiN-based, DLC, diamond coating, etc.
other	

## Carbide End Mill-R



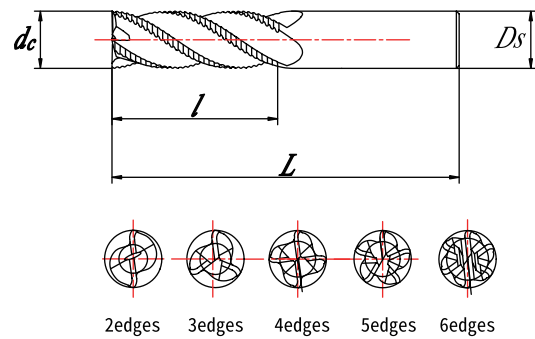
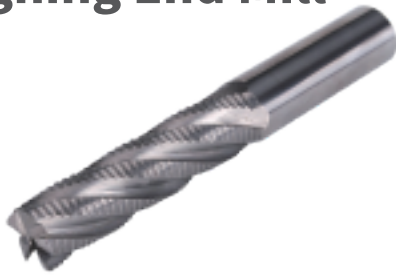
Materials suitable for processing	Carbon steel, stainless steel, cast iron, titanium alloy, aluminum alloy, high temperature alloy, non-metallic materials, etc.
Milling form	Side milling, slot milling, ramp milling, cavity milling, etc.
Blade diameter $d_c$ (mm)	3~32
R value	0.2~6
Blade length (l mm)	5~100
Total length L (mm)	38~200
Shank diameter $D_s$ (mm)	4~32
Handle form	Cylindrical shank, side fixed shank
Number of blades	2 edge, 3 edge, 4 edge, 5 edge, 6 edge, 8 edge
coating	TiN, TiAlN, AlCrN, AlTiN-based, DLC, diamond coating, etc.
other	The blade can be designed to shrink, avoid air, taper, etc.

## Carbide Ball End Mill



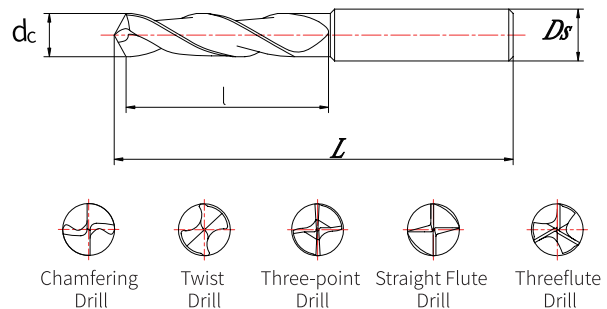
Materials suitable for processing	Carbon steel, stainless steel, cast iron, titanium alloy, aluminum alloy, high temperature alloy, non-metallic materials, etc.
Milling form	Face milling, profile milling, etc.
Blade diameter $d_c$ (mm)	3~32
Blade length (l mm)	5~100
Total length L (mm)	38~200
Shank diameter $D_s$ (mm)	4~32
Handle form	Cylindrical shank, side fixed shank
Number of blades	2-edge, 3-edge, 4-edge
coating	TiN, TiAlN, AlCrN, AlTiN-based, DLC, diamond coating, etc.
other	The blade can be designed to shrink, avoid air, taper, etc.

# Roughing End Mill



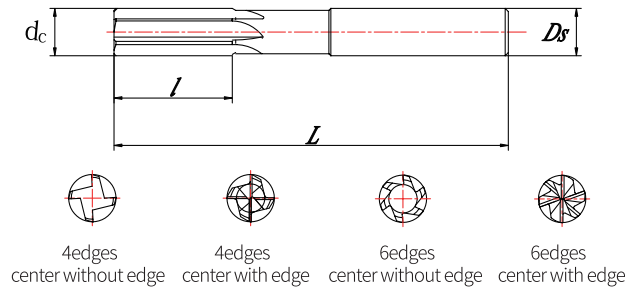
Materials suitable for processing	Carbon steel, stainless steel, cast iron, titanium alloy, aluminum alloy, high temperature alloy, non-metallic materials, etc.
Milling form	Side milling, slot milling, etc.
Blade diameter $d_c$ (mm)	6~32
Blade length ( $l$ mm)	5~100
Total length $L$ (mm)	50~200
Shank diameter $D_s$ (mm)	6~32
Handle form	Cylindrical shank, side fixed shank
Number of blades	2 edge, 3 edge, 4 edge, 5 edge, 6 edge
coating	TiN, TiAlN, AlCrN, AlTiN-based, DLC, diamond coating, etc.
other	The blade can be designed to shrink, avoid air, taper, etc.

# Drill



Materials suitable for processing	Carbon steel, stainless steel, cast iron, titanium alloy, aluminum alloy, high temperature alloy, non-metallic materials, etc.
Blade diameter $d_c$ (mm)	3~32
Slot length ( $l$ mm)	10~100
Total length $L$ (mm)	60~200
Shank diameter $D_s$ (mm)	4~32
Cooling form	Internal cooling, external cooling
Handle form	Cylindrical shank, side fixed shank
Drill bit form	Chamfer drill, twist drill, three-point drill, straight flute drill, three-edge drill
coating	TiN, TiAlN, AlCrN, AlTiN-based, DLC, diamond coating, etc.
other	The blade can be designed to shrink, avoid air, etc.

# Reamer



Materials suitable for processing	Carbon steel, stainless steel, cast iron, titanium alloy, aluminum alloy, high temperature alloy, non-metallic materials, etc.
Blade diameter $d_c$ (mm)	3~20
Slot length $l$ (mm)	5~30
Total length $L$ (mm)	60~150
Shank diameter $D_s$ (mm)	4~20
Cooling form	Internal cooling, external cooling
Handle form	Cylindrical shank
Reamer form	4 blades, 6 blades, etc.
coating	TiAlN, AlCrN-based, AlTiN-based, DLC
other	The blade can be designed to shrink, avoid air, etc.

# Ceramic Tools

Compared with cemented carbide tools, ceramic tools are more resistant to high temperatures and can achieve dry cutting, which not only saves costs but also is environmentally friendly; Good oxidation resistance makes it possible to realize high-speed cutting and improve production efficiency; Ceramic tools do not need coating, and can be used directly after CNC grinding.

## Cermet End Mill

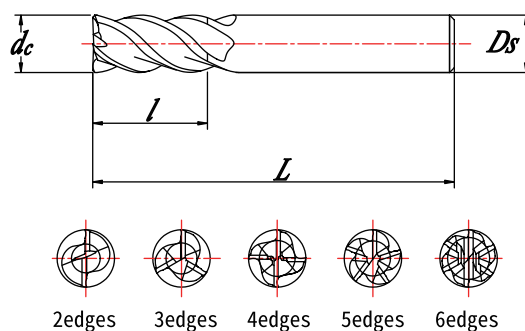
The friction coefficient of the cermet end mill is small, and it is easier to achieve higher surface quality when cutting steel parts.

## Sialon ceramic End Mill

The excellent Sialon ceramic materials, special groove and edge design ensure that Sialon ceramic end mill have extremely high wear resistance and can maintain high-strength continuous cutting under high temperature conditions. The cutting tool has good red and hard performance and is suitable for efficient rough machining of high-temperature alloy materials. Compared with cemented carbide tools, the cutting efficiency of Sialon ceramic end mill can be increased by more than 10 times.

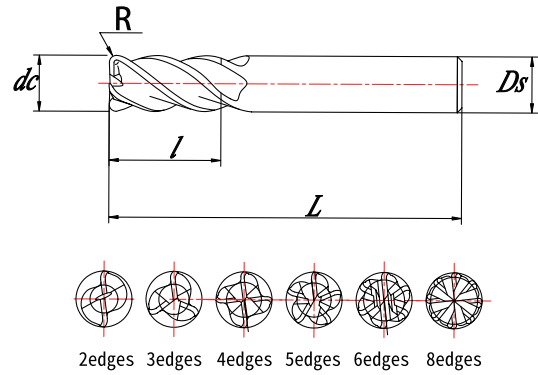


## Cermet End Mill



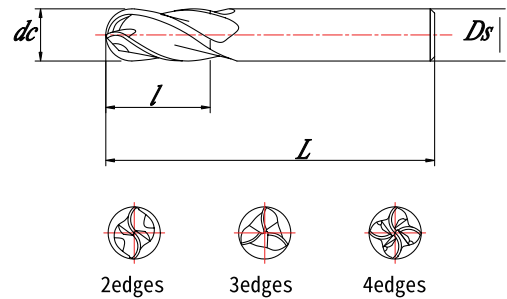
Materials suitable for processing	Carbon steel, stainless steel
Milling form	Side milling, shoulder milling, cavity milling, etc.
Blade diameter $d_c$ (mm)	3~32
Blade length $l$ (mm)	5~100
Total length $L$ (mm)	38~200
Shank diameter $D_s$ (mm)	4~32
Handle form	Cylindrical shank
Number of blades	2 edge, 3 edge, 4 edge, 5 edge, 6 edge
other	The blade can be designed to shrink, avoid air, taper, etc.

## Cermet End Mill-R



Materials suitable for processing	Carbon steel, stainless steel
Milling form	Side milling, shoulder milling, cavity milling, etc.
Blade diameter $d_c$ (mm)	3~32
R value	0.2~6
Blade length $l$ (mm)	5~100
Total length $L$ (mm)	38~200
Shank diameter $D_s$ (mm)	4~32
Handle form	Cylindrical shank
Number of blades	2 edge, 3 edge, 4 edge, 5 edge, 6 edge, 8 edge
other	The blade can be designed to shrink, avoid air, taper, etc.

## Cermet Ball End Mill



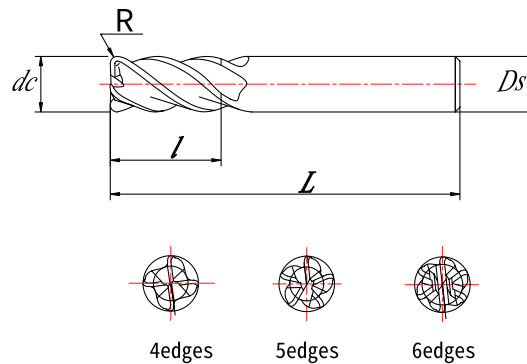
Materials suitable for processing	Carbon steel, stainless steel
Milling form	Side milling, shoulder milling, cavity milling, etc.
Blade diameter $d_c$ (mm)	3-32
Blade length $l$ (mm)	5-100
Total length $L$ (mm)	38-200
Shank diameter $D_s$ (mm)	4-32
Handle form	Cylindrical shank
Number of blades	2-edge, 3-edge, 4-edge
other	The blade can be designed to shrink, avoid air, taper, etc.



# Sialon ceramic End Mill

The excellent Sialon ceramic materials, special groove and edge design ensure that Sialon ceramic end mill have extremely high wear resistance and can maintain high-strength continuous cutting under high temperature conditions. The cutting tool has good red and hard performance and is suitable for efficient rough machining of high-temperature alloy materials. Compared with cemented carbide tools, the cutting efficiency of Sialon ceramic end mill can be increased by more than 10 times.

## Sialon ceramic End Mill-R



Materials suitable for processing	Superalloy
Milling form	Side milling, shoulder milling, cavity milling, etc.
Blade diameter $d_c$ (mm)	8~20
R value	0.5~6
Blade length $l$ (mm)	5~20
Total length $L$ (mm)	60~120
Shank diameter $D_s$ (mm)	8~20
Number of blades	4-edge, 5-edge, 6-edge
other	The blade can be designed to shrink, avoid air, taper, etc.

## Other



**T type  
end mill**



**Fast feed  
end mill**



**Step drill**



**Drill reamer**



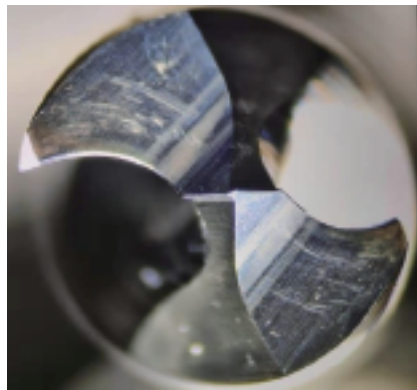
**Deep  
hole drill**

# 06

## Tool grinding

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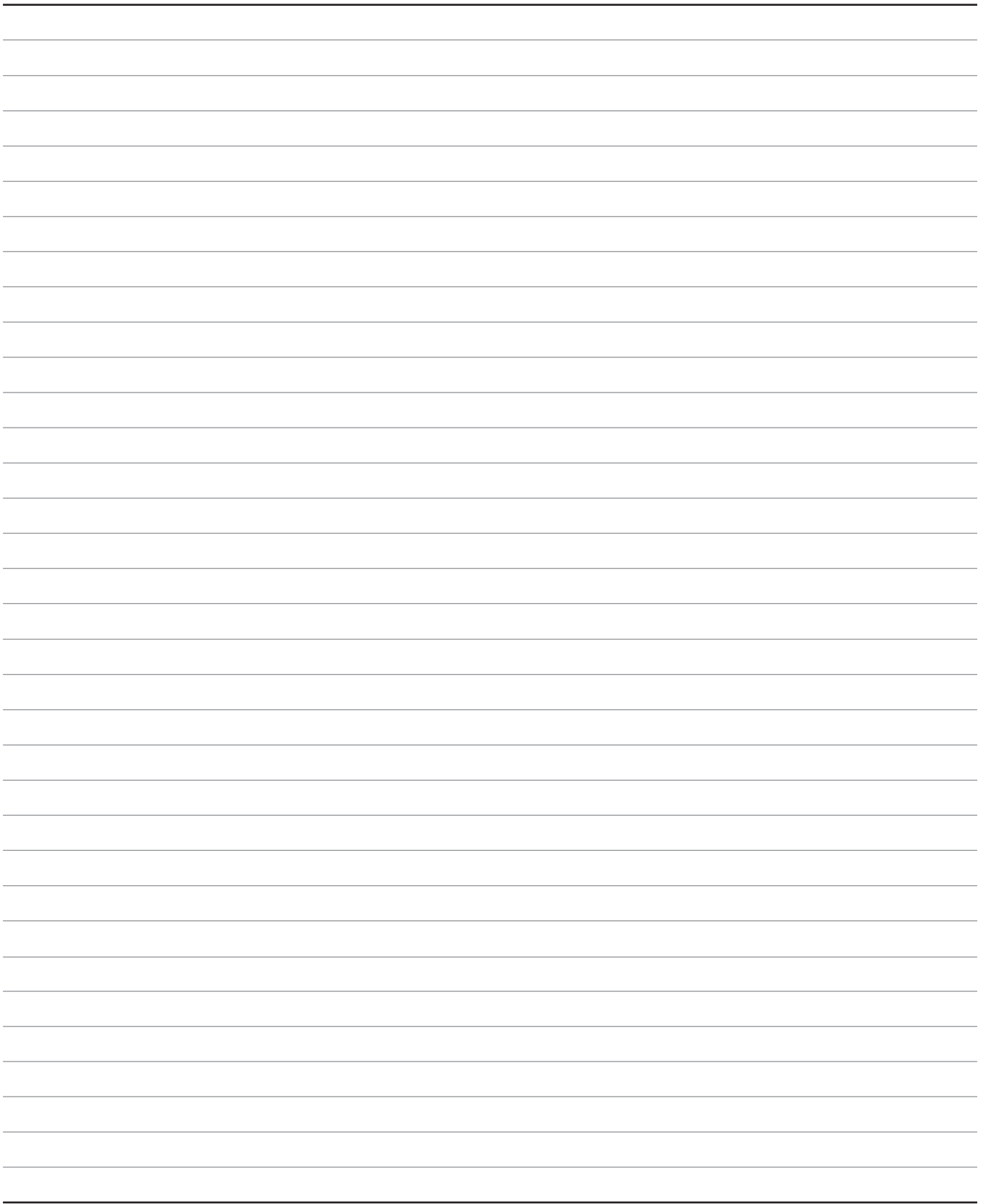
We imported five-axis CNC tool grinder, universal tool grinder, tool post-processing equipment, Zoller tool detector and other equipment, According to different customer cutting conditions and tools, a complete tool grinding standard has been established, which can realize the re-grinding and repairing of standard and special carbide end mill, drills, and reamers. The performance of the original new tool can be achieved at the first grinding, and the delivery time is usually about 3 to 5 working days.



Before grinding



After grinding





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Address: No.1136, Bazi Road,Gaozhao Steet, Xiuzhou District,  
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E-mail: [info@worldia-tools.com](mailto:info@worldia-tools.com)

