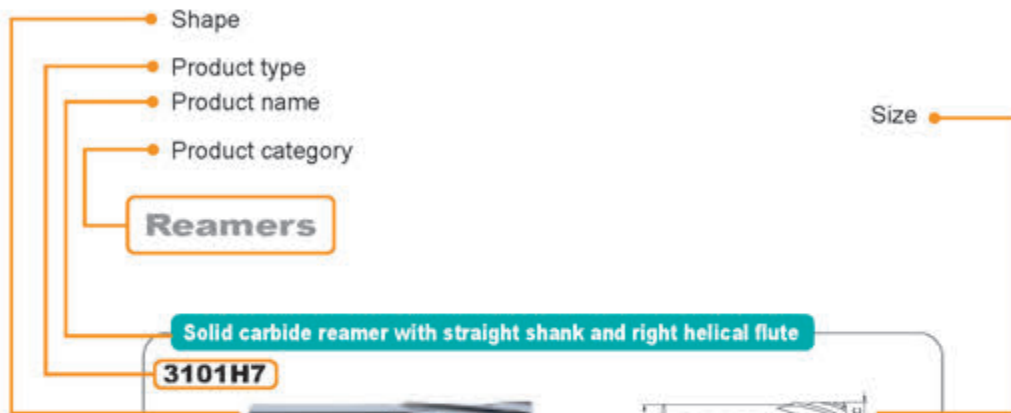




How to choose the right solid carbide reamers

How to choose the right solid carbide reamers



3101H7

H7

Type	Basic dimension(mm)				Number of tooth	Recommended grade YK10F
	DC	DCON/h ₁	OAL	LF		
3101H7-0400	4.0	3.55	56	20	4	☆
3101H7-0450	4.5	4.00	63	22	6	☆
3101H7-0500	5.0	4.00	63	22	6	☆
3101H7-0550	5.5	5.00	63	22	6	☆
3101H7-0600	6.0	5.00	63	22	6	☆
3101H7-0650	6.5	5.00	63	22	6	☆
3101H7-0700	7.0	6.30	71	25	6	☆
3101H7-0750	7.5	6.30	71	25	6	☆
3101H7-0800	8.0	6.30	71	25	6	☆
3101H7-0850	8.5	8.00	71	25	6	☆
3101H7-0900	9.0	8.00	71	25	6	☆
3101H7-0950	9.5	8.00	71	25	6	☆
3101H7-1000	10.0	8.00	71	25	6	☆
3101H7-1050	10.5	8.00	71	25	6	☆
3101H7-1100	11.0	10.00	80	28	6	☆
3101H7-1150	11.5	10.00	80	28	6	☆
3101H7-1200	12.0	10.00	80	28	6	☆
3101H7-1250	12.5	10.00	80	28	6	☆
3101H7-1300	13.0	10.00	80	28	6	☆
3101H7-1350	13.5	12.5	90	32	6	☆
3101H7-1400	14.0	12.5	90	32	6	☆
3101H7-1450	14.5	12.5	90	32	6	☆
3101H7-1500	15.0	12.5	90	32	6	☆
3101H7-1550	15.5	12.5	90	32	6	☆
3101H7-1600	16.0	12.5	90	32	6	☆
3101H7-1700	17.0	12.5	90	32	6	☆
3101H7-1800	18.0	16.00	100	36	6	☆
3101H7-1900	19.0	16.00	100	36	6	☆
3101H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Applicable material table ○ Very suitable □ Suitable

Grade	Workpiece material									
	Mild steel Hbs180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy
YK10F			~40HRC	~50HRC	~60HRC		○	○	○	○

Code key: C235 Cutting parameters: C239 Technical information: C240-C242 Non-standard customization tools: C243

Applicable workpiece material range

Hole precision class and shank type

Specification

Type, basic dimensions, number of tooth and grade.

Code key, cutting parameter, technical information, non-standard customization



Reamers

Solid carbide reamers overview ● C234

Icons information ● C234

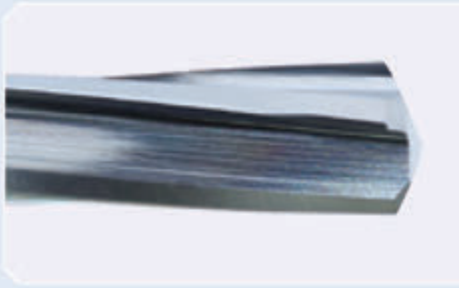
Solid carbide reamer code key ● C235

Detail information of solid carbide reamers ● C236-C238

Recommended cutting parameters for solid carbide reamers ● C239

Technical information for solid carbide reamers ● C240-C242




Non-standard customized solid carbide reamers ● C243



GROUP



Solid carbide reamers overview

Name	Type	Shape	Diameter range	Workpiece material								Page	
				P		M	K	N		S	H	Specification	Cutting parameters
				Mild steel	Common steel	Stainless steel	Cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy	High hardness steel		
Right helical flute reamer	3101H7		Ø4-Ø20				○	○	○			C236	C239
Straight flute reamer	3102H7		Ø4-Ø20				○	○	○			C237	C239
Left helical flute reamer	3103H7		Ø4-Ø20				○	○	○			C238	C239

○ Very suitable ○ Suitable

Solid carbide reamers icons information

Precision class of reamed hole

H7

The precision class of reamed hole reaches H7 specified in GB/T1800-1804

Shank type



Straight shank



Solid carbide reamer code key

Code	Description
3	Reamer

Tool type

Code	Description
1	Right chip flute
2	Straight flute
3	Left chip flute

Type of flute

Code	Description
H7	The precision class of reamed hole reaches H7 specified in GB/T1800-1804

Precision class of reamed hole

3 1 0 1 H7 -0850

Shank type	
Code	Description
1	Straight shank
2	Square straight shank as per DIN10
5	Straight shank as per DIN6535HA
9	Tapered shank

Mode of cooling	
Code	Description
0	External coolant
1	Internal coolant

Specification	
Code	Description
0850	Diameter is 8.5mm

Drilling tools
Reaming Tools



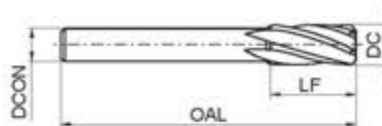
Solid carbide reamer code key



Solid carbide reamer with straight shank and right helical flute

Solid carbide reamer with straight shank and right helical flute

3101H7



H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade
	DC	DCON _(h7)	OAL	LF		YK10F
3101H7-0400	4.0	3.55	56	20	4	☆
3101H7-0450	4.5	4.00	63	22	6	☆
3101H7-0500	5.0	4.00	63	22	6	☆
3101H7-0550	5.5	5.00	63	22	6	☆
3101H7-0600	6.0	5.00	63	22	6	☆
3101H7-0650	6.5	5.00	63	22	6	☆
3101H7-0700	7.0	6.30	71	25	6	☆
3101H7-0750	7.5	6.30	71	25	6	☆
3101H7-0800	8.0	6.30	71	25	6	☆
3101H7-0850	8.5	8.00	71	25	6	☆
3101H7-0900	9.0	8.00	71	25	6	☆
3101H7-0950	9.5	8.00	71	25	6	☆
3101H7-1000	10.0	8.00	71	25	6	☆
3101H7-1050	10.5	8.00	71	25	6	☆
3101H7-1100	11.0	10.00	80	28	6	☆
3101H7-1150	11.5	10.00	80	28	6	☆
3101H7-1200	12.0	10.00	80	28	6	☆
3101H7-1250	12.5	10.00	80	28	6	☆
3101H7-1300	13.0	10.00	80	28	6	☆
3101H7-1350	13.5	12.5	90	32	6	☆
3101H7-1400	14.0	12.5	90	32	6	☆
3101H7-1450	14.5	12.5	90	32	6	☆
3101H7-1500	15.0	12.5	90	32	6	☆
3101H7-1550	15.5	12.5	90	32	6	☆
3101H7-1600	16.0	12.5	90	32	6	☆
3101H7-1700	17.0	12.5	90	32	6	☆
3101H7-1800	18.0	16.00	100	36	6	☆
3101H7-1900	19.0	16.00	100	36	6	☆
3101H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Drilling tools

Reaming Tools

Solid carbide reamer with straight shank and right helical flute

Applicable material table

○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
YK10F			~40HRC	~50HRC	~60HRC		○	○	○	○	

Code key

C235

Cutting parameters

C239

Technical information

C240-C242

Non-standard customization tools

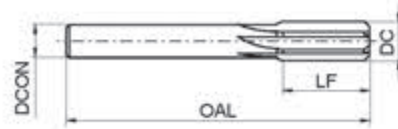
C243



Solid carbide reamer with straight shank and straight flute

Solid carbide reamer with straight shank and straight flute

3102H7



H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade
	DC	DCON _{h7}	OAL	LF		YK10F
3102H7-0400	4.0	3.55	56	20	4	☆
3102H7-0450	4.5	4.00	63	22	6	☆
3102H7-0500	5.0	4.00	63	22	6	☆
3102H7-0550	5.5	5.00	63	22	6	☆
3102H7-0600	6.0	5.00	63	22	6	☆
3102H7-0650	6.5	5.00	63	22	6	☆
3102H7-0700	7.0	6.30	71	25	6	☆
3102H7-0750	7.5	6.30	71	25	6	☆
3102H7-0800	8.0	6.30	71	25	6	☆
3102H7-0850	8.5	8.00	71	25	6	☆
3102H7-0900	9.0	8.00	71	25	6	☆
3102H7-0950	9.5	8.00	71	25	6	☆
3102H7-1000	10.0	8.00	71	25	6	☆
3102H7-1050	10.5	8.00	71	25	6	☆
3102H7-1100	11.0	10.00	80	28	6	☆
3102H7-1150	11.5	10.00	80	28	6	☆
3102H7-1200	12.0	10.00	80	28	6	☆
3102H7-1250	12.5	10.00	80	28	6	☆
3102H7-1300	13.0	10.00	80	28	6	☆
3102H7-1350	13.5	12.5	90	32	6	☆
3102H7-1400	14.0	12.5	90	32	6	☆
3102H7-1450	14.5	12.5	90	32	6	☆
3102H7-1500	15.0	12.5	90	32	6	☆
3102H7-1550	15.5	12.5	90	32	6	☆
3102H7-1600	16.0	12.5	90	32	6	☆
3102H7-1700	17.0	12.5	90	32	6	☆
3102H7-1800	18.0	16.00	100	36	6	☆
3102H7-1900	19.0	16.00	100	36	6	☆
3102H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

▶ Applicable material table

○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
YK10F			~40HRC	~50HRC	~60HRC		○	○	○	○	

Code key

C235

Cutting parameters

C239

Technical information

C240-C242

Non-standard customization tools

C243

Drilling tools

Reaming Tools

Solid carbide reamer with straight shank and straight flute



Solid carbide reamer with straight shank and left helical flute

Solid carbide reamer with straight shank and left helical flute

3103H7



H7



Type	Basic dimension(mm)				Number of tooth	Recommended grade
	DC	DCON(h ₇)	OAL	LF		YK10F
3103H7-0400	4.0	3.55	56	20	4	☆
3103H7-0450	4.5	4.00	63	22	6	☆
3103H7-0500	5.0	4.00	63	22	6	☆
3103H7-0550	5.5	5.00	63	22	6	☆
3103H7-0600	6.0	5.00	63	22	6	☆
3103H7-0650	6.5	5.00	63	22	6	☆
3103H7-0700	7.0	6.30	71	25	6	☆
3103H7-0750	7.5	6.30	71	25	6	☆
3103H7-0800	8.0	6.30	71	25	6	☆
3103H7-0850	8.5	8.00	71	25	6	☆
3103H7-0900	9.0	8.00	71	25	6	☆
3103H7-0950	9.5	8.00	71	25	6	☆
3103H7-1000	10.0	8.00	71	25	6	☆
3103H7-1050	10.5	8.00	71	25	6	☆
3103H7-1100	11.0	10.00	80	28	6	☆
3103H7-1150	11.5	10.00	80	28	6	☆
3103H7-1200	12.0	10.00	80	28	6	☆
3103H7-1250	12.5	10.00	80	28	6	☆
3103H7-1300	13.0	10.00	80	28	6	☆
3103H7-1350	13.5	12.5	90	32	6	☆
3103H7-1400	14.0	12.5	90	32	6	☆
3103H7-1450	14.5	12.5	90	32	6	☆
3103H7-1500	15.0	12.5	90	32	6	☆
3103H7-1550	15.5	12.5	90	32	6	☆
3103H7-1600	16.0	12.5	90	32	6	☆
3103H7-1700	17.0	12.5	90	32	6	☆
3103H7-1800	18.0	16.00	100	36	6	☆
3103H7-1900	19.0	16.00	100	36	6	☆
3103H7-2000	20.0	16.00	100	36	6	☆

☆ Recommended grade (produce according to order)

Drilling tools

Reaming Tools

Solid carbide reamer with straight shank and left helical flute

Applicable material table

○ Very suitable ○ Suitable

Grade	Workpiece material										
	Mild steel HB≤180	Carbon steel, Alloy steel	Pre-hardened steel, Hardened steel			Stainless steel	Cast iron	Nodular cast iron	Aluminum alloy	Copper alloy	Heat resistant alloy
YK10F			~40HRC	~50HRC	~60HRC		○	○	○	○	

Code key

C235

Cutting parameters

C239

Technical information

C240-C242

Non-standard customization tools

C243

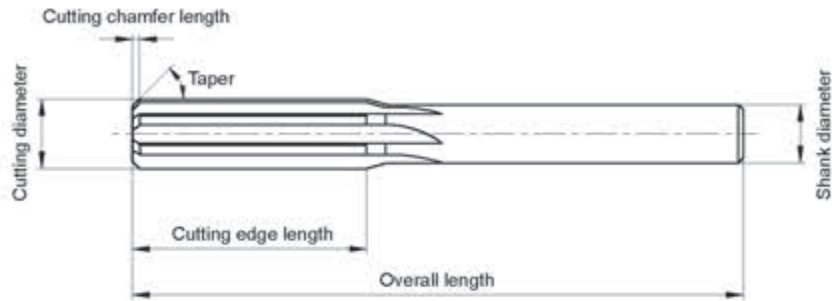


3101H7★3102H7★3103H7

Workpiece material	Cast iron Nodular cast iron			Copper alloy			Casting aluminium alloy		
	8~16m/min			10~25m/min			15~30 m/min		
Cutting speed	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)	Rotating speed (min ⁻¹)	Feed rate (mm/r)	Allowance (mm)
4	950	0.04~0.06	0.1~0.2	1600	0.04~0.06	0.1~0.2	2000	0.04~0.06	0.1~0.2
5	760	0.05~0.09	0.1~0.2	1300	0.05~0.09	0.1~0.2	1600	0.05~0.09	0.1~0.2
6	640	0.06~0.12	0.1~0.2	1050	0.06~0.12	0.1~0.2	1300	0.06~0.12	0.1~0.2
7	550	0.07~0.14	0.1~0.2	910	0.07~0.14	0.1~0.2	1150	0.07~0.14	0.1~0.2
8	480	0.08~0.16	0.1~0.2	800	0.08~0.16	0.1~0.2	1000	0.08~0.16	0.1~0.2
9	430	0.09~0.18	0.1~0.2	710	0.09~0.18	0.1~0.2	890	0.09~0.18	0.1~0.2
10	380	0.10~0.20	0.1~0.2	640	0.10~0.20	0.1~0.2	800	0.10~0.20	0.1~0.2
11	350	0.11~0.22	0.1~0.2	580	0.11~0.22	0.1~0.2	720	0.11~0.22	0.1~0.2
12	320	0.12~0.24	0.1~0.2	530	0.12~0.24	0.1~0.2	660	0.12~0.24	0.1~0.2
13	290	0.13~0.26	0.1~0.2	490	0.13~0.26	0.1~0.2	610	0.13~0.26	0.1~0.2
14	270	0.14~0.28	0.1~0.2	460	0.14~0.28	0.1~0.2	570	0.14~0.28	0.1~0.2
15	250	0.15~0.30	0.1~0.2	430	0.15~0.30	0.1~0.2	530	0.15~0.30	0.1~0.2
16	240	0.16~0.32	0.1~0.2	400	0.16~0.32	0.1~0.2	500	0.16~0.32	0.1~0.2
17	225	0.18~0.34	0.1~0.2	380	0.18~0.34	0.1~0.2	470	0.18~0.34	0.1~0.2
18	210	0.20~0.36	0.1~0.2	350	0.20~0.36	0.1~0.2	440	0.20~0.36	0.1~0.2
19	200	0.22~0.38	0.1~0.2	340	0.22~0.38	0.1~0.2	420	0.22~0.38	0.1~0.2
20	190	0.24~0.40	0.1~0.2	320	0.24~0.40	0.1~0.2	400	0.24~0.40	0.1~0.2

1. Please select the holder with high rigidity and high precision.
2. Make sure coolant supply is sufficient.
3. Please adjust cutting parameters according workpiece and machine rigidity.

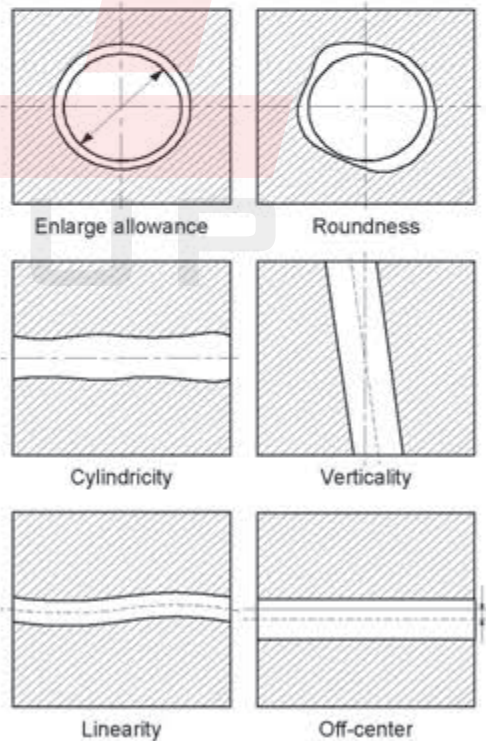
Terminology of reamer



Reaming is the semi-finishing and finishing of an existing hole to achieve precise size, high surface quality, perfect roundness and cylindricity, etc.

In order to gain precise hole in reaming process, the reamer diameter must be defined correctly. Therefore, it is necessary to consider the allowance which is determined by workpiece material and machining conditions. It is also necessary to select the cutting conditions correctly in addition to using high precision reamer to achieve good surface quality.

The reaming precision is mainly determined by diameter and radial run-out. With respect to cutting condition, it is better to select low speed cutting to improve machining precision, but the upper limit should be considered carefully for higher machining efficiency.





Common problems and solutions for reaming

Common problems	Solutions
Oversized holes	<ol style="list-style-type: none"> 1.Reduce diameter of reamer. 2.The center of reamer is not in alignment with hole center. Adjust the concentricity of hole and reamer. 3.Radial run-out of reamer is too large. Good radial run-out is a key to successful reaming. 4.Scratches on reamer shank. 5.When using bushing and bushing, ensure shank is clean. 6.Select a suitable coolant. 7.Adjust cutting parameters.
Undersized holes	<ol style="list-style-type: none"> 1.Increase diameter of reamer. 2.Reduce rotating speed. 3.Reduce the margin width. 4.Excessive tool abrasion, please conduct cutting after regrinding. 5.Thermal expansion coefficient of workpiece is too large. Please keep it cooled enough.
Poor hole roundness and linearity	<ol style="list-style-type: none"> 1.Ensure better roundness of reamer chamfer. 2.Reamer rigidity is low. Make the overhang as short as possible in conditions of non-inference. 3.Check radial run-out after clamping reamer. 4.Adjust the concentricity of hole and reamer. 5.Ensure reaming allowance equality.
Poor hole surface quality	<ol style="list-style-type: none"> 1.The hole surface roughness of entering part is bad. 2.Reduce rotating speed. 3.Ensure correct reaming allowance. The allowance being too large or too small would result in bad surface roughness. 4.Select the reamer with large chip pocket to avoid chip jamming. 5.Increase clearance angle of reamer entering part. 6.Check whether there is built-up on chamfer and margin land. 7.Increase the rigidity of machine, holder and reamer. 8.Check out whether the type of reamer head is suitable for the workpiece. 9.Increase the margin width and land width appropriately.
Hole precision is low	<ol style="list-style-type: none"> 1.In return pass, the reamer should be pulled out of hole rotating at the same direction as before. Opposite rotation must be prohibited. 2.Reduce rotating speed. 3.Select the reamer with more lips. 4.Increase the margin width appropriately to enhance the guiding performance and extrusion effect. 5.Improve reamer lubricating property by surface treatment. 6.Select a suitable coolant.



Common problems and solutions for reaming

Common problems	Solutions
Reamer breakage, thermal damage	<ol style="list-style-type: none"> 1.The guide hole is defective before reaming, for example, linearity is not good. 2.Adjust machining allowance to avoid tool breakage caused by too large allowance. 3.If the chip removal is obstructed, select a reamer with larger chip pocket. 4.Ensure sufficient coolant supply. 5.Adjust rotating speed and feed speed appropriately. 6.Increase the rigidity of machine, holder and reamer. 7.Improve the sharpness of reamer to make cutting easy and fast. 8.Excessive abrasion occurs on cutting edge, which means tool life has expired. It is recommended to change or regrind tool.
Damage on reamer shank	<ol style="list-style-type: none"> 1.Check whether the shank hardness is enough. Too low hardness would cause deformation, and too high hardness may cause breakage. 2.Check the conjunction of holder and bushing. Do not use a defective holder.
Short tool life	<ol style="list-style-type: none"> 1.Enhance the hardness of reamer cutting edge. 2.Select the reamer made by advanced material. 3.Check the coolant. 4.Use surface treatment for reamer such as nitride process. 5.Change the straight flute to helical flute. 6.Check all factors affecting machining precision.
Scratches on hole surface	<ol style="list-style-type: none"> 1.Make sure no built-up is on the reamer surface. 2.Improve workpiece holding.
Trumpet-shaped entry hole	<ol style="list-style-type: none"> 1.Improve workpiece holding. 2.Check radial run-out after clamping reamer. 3.The center of reamer is not in alignment with the hole center. Adjust the concentricity of hole and reamer.
Oversized holes	<ol style="list-style-type: none"> 1.The center of reamer is not in alignment with hole center. Adjust the concentricity of hole and reamer. 2.Improve workpiece holding.



Company name:	ZCC-CT
Fax:	Huanghe Southern Road, Tianyuan Zone, Zhuzhou, Hunan province
Tel:	Fax: 0731-22882721 22885420 22887878
E-MAIL:	Zip code: 412007 E-mail: zcct@zcct.com

Hole information and workpiece material

Hole shape to be machined: <input type="checkbox"/> Through hole <input type="checkbox"/> Blind hole	Material grade to be processed:
Size of processed hole= _____ mm	<input type="checkbox"/> Grey cast iron
Tolerance of processed hole= _____	<input type="checkbox"/> Ductile Iron
Depth of processed hole= _____ mm	<input type="checkbox"/> Aluminum alloy
	Tensile strength= _____ N/mm ²
	<input type="checkbox"/> Silicon Aluminum Alloy Si < 10%
	Hardness= _____ Units:(HRC,HB,etc.)
	<input type="checkbox"/> Silicon Aluminum Alloy Si ≥ 10%

Direction of cutting tools' rotation	DC= _____	
Right-handed rotation <input type="checkbox"/>	Tol: _____	
Straight flute <input type="checkbox"/>		
Left-handed rotation <input type="checkbox"/>		

Lead angle forms	

Coolant type	
Internal coolant	<input type="checkbox"/>
External coolant	<input type="checkbox"/>

Coating	
Coated	<input type="checkbox"/>
Non-Coated	<input type="checkbox"/>

Shank form	
DIN6535	<input type="checkbox"/> Form HA
	<input type="checkbox"/> Form HB
	<input type="checkbox"/> Form HE
<input type="checkbox"/>	Ordinary straight handle
<input type="checkbox"/>	With flat tail handle DIN 1809
<input type="checkbox"/>	Morse Taper Shank MT <input type="checkbox"/>
Special shapes	

Note:

Order Quantity: _____ PCS Expected delivery date: _____

Quotation: _____ Confirmation: _____

Date: _____

Drilling tools

Reaming Tools

Non-standard customization for special application