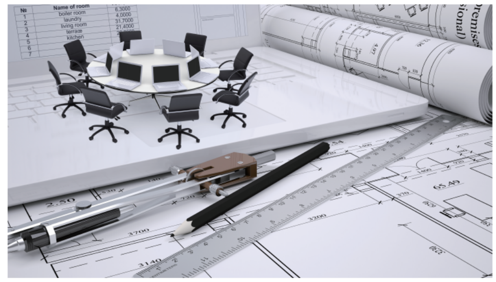
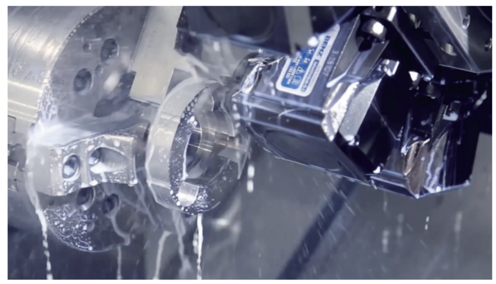
Non Standard Ordering Process



1 Requirements Communication

2 Solution Confirmation

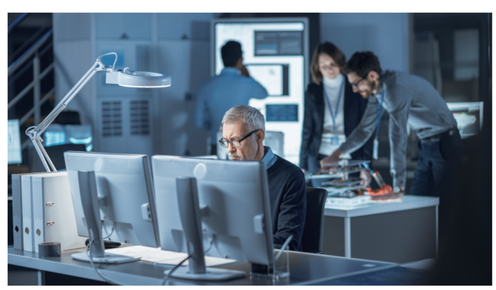


3 Samples Test

4 On-site Technical Service

5 Solution Improving

6 Meet Requirements

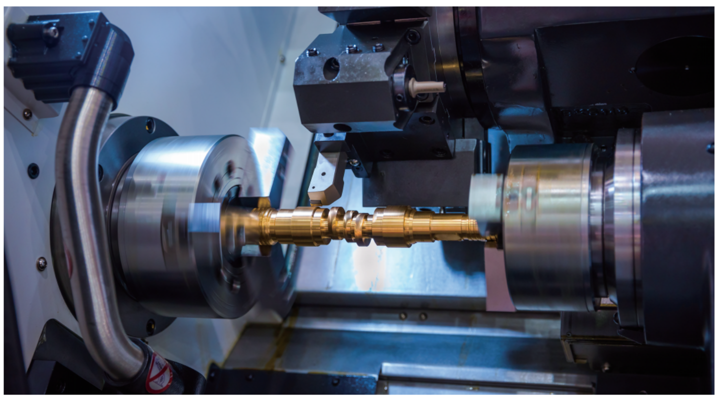


7 Constant Optimization

Advantages of customized Special Tool Service

1.Available for all kinds of metal cutting tools

Our customized special tool service covers all ranges of metal cutting tools such as drilling, milling, turning. Therefore in this service, customers come up with machining requirements and we are responsible for the ideal results.



2.Provide total machining solutions

Based on customer's machining conditions, workpiece materals and specific needs, we solve machining problems by one-stop service from providing total machining solutions made to achieve excellent machining effect to designing and manufacturing whole set of cutting tools.

3.Constant optimization and improvement

We do our best to constantly help customers improving and optimizing machining process,reducing costs, raising productivity and competitiveness.

In order to provide customized solution, we require some more detailed information as follows:

Drawing of the workpiece

Material of the Workpiece

Clamping Situation

Machine Data

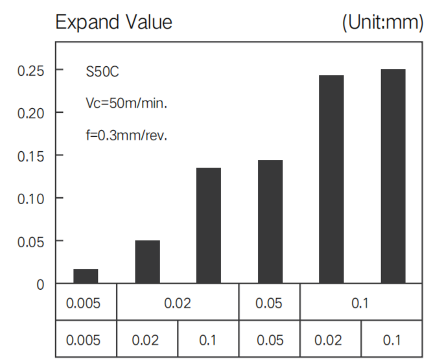
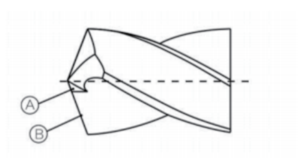
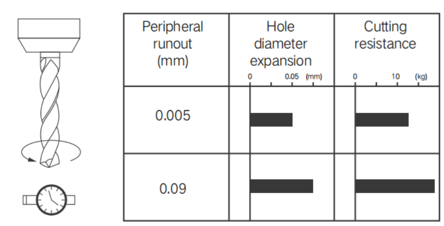
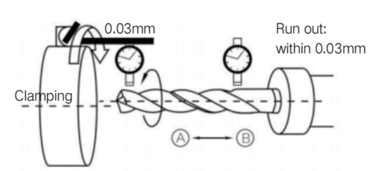
Purchasing Requirement

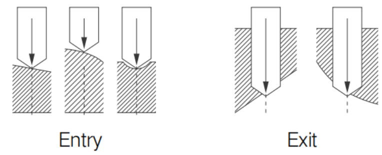
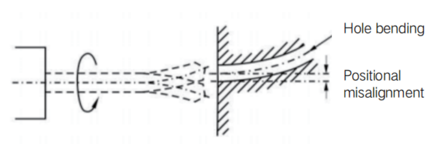
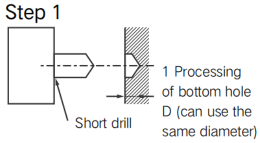
Cutting Definitions and Calculations

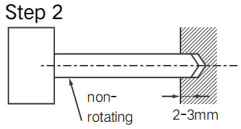
Parameter and Unit					
D	Diameter	mm	**Fn**	Feed per revolution	mm/rev
ap	Cutting depth	mm	**Fz**	Feeding per teeth	mm/tooth
ae	Cutting width	mm	**Z**	Number of teeth	
Vf	Feed rate	mm/min	**n**	Spindle speed	rev/min
Vc	Cutting speed	m/min	**L**	Length	mm
Q	Rate of metal removal	cm^3/min	**Tc**	Processing time	min

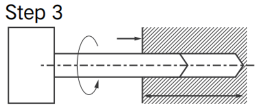
General formula			
N	Spindle speed	$n = \frac{Vc \cdot 1000}{\pi \cdot D}$	(rev/min)
Vc	Cutting speed	$Vc = \frac{\pi \cdot D \cdot n}{1000}$	(m/min)
Vf	Feed rate	$Vf = fz \cdot z \cdot n$	(mm/min)
fz	Feed per teeth	$fz = \frac{Vf}{z \cdot n}$	(mm)
Q	Rate of metal removal	$Q = \frac{ae \cdot ap \cdot Vf}{1000}$	(cm^3/min)
Tc	Processing time	$Tc = \frac{L}{Vf}$	(mm)

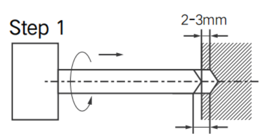
Precautions for Using Hole Machining Tools

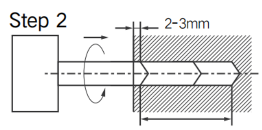
<table>
<tr><td rowspan="3">Drill Runout Accuracy</td><td>Drill runout accuracy not only refers to the commonly used indicator of the height difference at the outer cutting edge (B) but also to the runout accuracy at the web thinning area (A) after web thinning. This is equally important.</td><td rowspan="3">Ⓐ Central runout
Ⓑ Peripheral runout
</td></tr>
<tr><td></td></tr>
<tr><td>A: Runout after chisel edge thinning
B: Runout after clearance grinding (peripheral cutting edge height difference)</td></tr>
<tr><td rowspan="2">Peripheral runout accuracy of the drill after clamping (when the tool is rotating)</td><td>Please control the peripheral runout accuracy of the drill after clamping (when the tool is rotating) within 0.03mm.</td><td rowspan="2">Run out:
within 0.03mm
Cutting resistance refers to the force in the horizontal direction.
Drill:D12.0
Workpiece material:S5OC(HB230)
Cutting condition: Vc=50m/min, f=0.3mm/rev, Depth=38mm
Water-soluble cutting oil</td></tr>
<tr><td>If this value is too large, not only will the hole diameter increase, but the cutting resistance in the horizontal direction will also increase. In cases where the machine tool and workpiece clamping rigidity are low, this could potentially cause the drill to break.</td></tr>
<tr><td>Radial runout accuracy after drill clamping (when the workpiece material is rotating)</td><td>When using a lathe, please control the radial runout at the cutting edge A of the drill to within 0.03mm, and also adjust the straightness of B to the same degree.</td><td></td></tr>
</table>

<table>
<tr>
<td>The condition of the machined surface and the performance of the drill bit</td>
<td>When there is an inclination or uneven surface:
If the shape at the entry or exit of the hole is irregular, please reduce the feed rate to 0.1-0.15 mm/rev.</td>
<td>
</td>
</tr>
<tr>
<td>Usage Method for Deep Hole Drills</td>
<td>When using deep hole drills at high speeds, issues such as shown in the right image can occur. These issues include excessive runout at the drill tip, misalignment at the entry point, hole body bending, and drill breakage.</td>
<td>
</td>
</tr>
<tr>
<td>countermeasure</td>
<td colspan="2">
Method 1
Step 1


Step 2


Step 3

Process under recommended cutting conditions

Method 2
Can reduce bending caused by centrifugal force of the drill bit during low-speed rotation
Step 1


(100-300min ')(0.05-0.08mm/rev.)
Step 2


Process under recommended cutting conditions
</td>
</tr>
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