

art.

Incorrect tap selection

Increase tap limit number (13 $\mu$ m increase per number).

- Oversize effective diameter.
- Increase chamfer relief angle.
- Reduce chamfer length.

Chips left on the thread face.

Incorrect tap selection

- Increase chamfer length.
- Adjust rake angle to suitable work material.

Galling

- Select the taps with surface treatment.
- Provide oil groove.
- Change to internal oil supply type.
- Adopt side-through system (M5 or smaller)

- Select the taps with surface treatment.
- Change to internal oil supply type. (M6 or larger).
- Change to side-through system (M5 or smaller).

Chip packing

- Change to spiral fluted tap or spiral pointed tap.
- Change number of flutes to provide larger chip pockets.
- Change to internal oil supply type or side-through oil supply type.

Countermeasures (Operating Conditions)				
Tapping Conditions	Hole	Cutting Lubricant and Lubricating Method	Tooling	Other
<ul style="list-style-type: none"> <li>● Avoid run-out of tap.</li> <li>● Switch to pitch feed mode.</li> </ul>			Use a floating type tap holder.	
Reduce tapping speed.	Maximize hole diameter within the range of standard.	<ul style="list-style-type: none"> <li>● Increase lubricating volume.</li> <li>● Reduce water-soluble oil dilution strength.</li> <li>● Use non-water-soluble oil.</li> </ul>		
<ul style="list-style-type: none"> <li>● Avoid run-out of tap.</li> <li>● Align the center of the hole with that of the tap.</li> <li>● Switch to pitch feed mode.</li> </ul>	Chamfering entrance of the hole.		Use a floating type tap holder.	
Prevent accumulation of chips at the bottom of the hole. (HT → TF or SP)	Review relations among hole depth, chamfer length and effective thread length.			
		<ul style="list-style-type: none"> <li>● Increase lubricating volume.</li> <li>● Change to internal oil supply type.</li> </ul>		Change from cutting taps to forming taps.
Reduce tapping speed.	Maximize hole diameter within the range of standard.	<ul style="list-style-type: none"> <li>● Increase lubricating volume.</li> <li>● Reduce water-soluble oil dilution strength.</li> <li>● Use non-water-soluble oil.</li> </ul>		
<ul style="list-style-type: none"> <li>● Avoid misalignment.</li> <li>● Completely remove chips generated in previous process.</li> </ul>	Maximize hole diameter within the range of standard.	<ul style="list-style-type: none"> <li>● Increase lubricating volume.</li> <li>● Change to internal oil supply type.</li> </ul>		

Problem		Countermeasures (Tap)	
Specific Problem	Cause	Forming Tap	Cutting Tap
Breakage	Chip packing		<ul style="list-style-type: none"> <li>● Change to spiral fluted tap or spiral pointed tap.</li> <li>● Change number of flutes to provide larger chip pockets.</li> <li>● Change to internal oil supply type or side-through oil supply type.</li> </ul>
	Excessive tapping torque	<ul style="list-style-type: none"> <li>● Reduce No. of radial.</li> <li>● Shorten thread length.</li> <li>● Increase oil grooves.</li> <li>● Change to internal oil supply type.</li> </ul>	<ul style="list-style-type: none"> <li>● Increase rake angle.</li> <li>● Increase amount of thread relief.</li> <li>● Widen flute area.</li> </ul>
	Galling	<ul style="list-style-type: none"> <li>● Select the taps with surface treatment.</li> <li>● Provide oil groove.</li> <li>● Change to internal oil supply type. (M6 or larger)</li> <li>● Change to side-through system (M5 or smaller).</li> </ul>	<ul style="list-style-type: none"> <li>● Select the taps with surface treatment.</li> <li>● Change to internal oil supply type. (M6 or larger)</li> <li>● Change to side-through system (M5 or smaller).</li> </ul>
	Incorrect operating conditions		
Chipping of tap threads	Incorrect tap selection	<ul style="list-style-type: none"> <li>● Change material to durable one.</li> <li>● Reduce hardness of the material.</li> </ul>	<ul style="list-style-type: none"> <li>● Change material to durable one.</li> <li>● Reduce hardness of the material.</li> <li>● Adjust rake angle to suitable work material.</li> <li>● Reduce thread length.</li> <li>● Widen flute area.</li> </ul>
	Incorrect operating conditions		
Excessive wear	Incorrect tap selection	<ul style="list-style-type: none"> <li>● Select the taps with surface treatment.</li> <li>● Increase oil grooves.</li> <li>● Change to internal oil supply type. (M6 or larger)</li> <li>● Change work material.</li> </ul>	<ul style="list-style-type: none"> <li>● Select the taps with surface treatment.</li> <li>● Decrease rake angle.</li> <li>● Change work material.</li> </ul>
	Incorrect operating conditions		
<b>Thread Matching error</b> <small>(When an external thread is inserted with an automatic fastener, it does not go all the way in.)</small>	The external thread gets into the crest seam created by a forming tap. (see page 22)	<ul style="list-style-type: none"> <li>● Use Burrless TAFLET</li> <li>● Use Seamless TAFLET to remove the double crests.</li> </ul>	



Countermeasures (Operating Conditions)				
Tapping Conditions	Hole	Cutting Lubricant and Lubricating Method	Tooling	Other
<ul style="list-style-type: none"> <li>● Avoid misalignment.</li> <li>● Completely remove chips generated in previous process.</li> </ul>	<ul style="list-style-type: none"> <li>● Maximize hole diameter within the range of standard.</li> </ul>	<ul style="list-style-type: none"> <li>● Increase lubricating volume.</li> <li>● Change to internal oil supply type.</li> </ul>		
<ul style="list-style-type: none"> <li>● Reduce tapping speed.</li> </ul>	<ul style="list-style-type: none"> <li>● Maximize hole diameter within the range of standard.</li> </ul>	<ul style="list-style-type: none"> <li>● Increase lubricating volume.</li> <li>● Reduce water-soluble oil dilution strength.</li> <li>● Use non-water-soluble oil.</li> </ul>		
<ul style="list-style-type: none"> <li>● Reduce tapping speed.</li> </ul>		<ul style="list-style-type: none"> <li>● Increase lubricating volume.</li> <li>● Reduce water-soluble oil dilution strength.</li> <li>● Use non-water-soluble oil.</li> </ul>		
<ul style="list-style-type: none"> <li>● Drive tap straightly into the hole.</li> </ul>	<ul style="list-style-type: none"> <li>● Drill the hole straight.</li> <li>● Prepare correct hole size.</li> <li>● Keep sufficient hole depth.</li> </ul>	<ul style="list-style-type: none"> <li>● Lubricate tapping positions properly.</li> </ul>		Prevent intrusion of foreign matter (drill chips, etc.)
<ul style="list-style-type: none"> <li>● Reduce tapping speed.</li> <li>● Align the center of the hole with that of the tap.</li> <li>● Avoid deflection of hole.</li> </ul>	<ul style="list-style-type: none"> <li>● Prepare correct hole size.</li> </ul>			
<ul style="list-style-type: none"> <li>● Reduce tapping speed.</li> </ul>	<ul style="list-style-type: none"> <li>● Prevent work hardening when drilling a hole.</li> </ul>	<ul style="list-style-type: none"> <li>● Increase lubricating volume.</li> <li>● Reduce water-soluble oil dilution strength.</li> <li>● Use non-water-soluble oil.</li> </ul>		