TROUBLE SHOOTING

Problem		Tap			Operating Conditions	
	Specific Problem	Selection	Designed Spec.	Regrinding	Machine Used	Tooling
Oversize Pitch Diameter	Incorrect tap selection	①Select tap of appropriate limit. ②Increase chamfer length. ③Select con-eccentric relief tap.	①Reduce rake angle. ②Increase margin width of thread. ③Correct relief angle of chamfer section.			
	Chip packing	①Select POT/SFT/XPF/NRT/HRT. ②Select tap with oil hole.	①Reduce number of flutes to provide extra chip room.			
	Incorrect operating conditions				Adjust machine capacity (drive force) to appropriate level.	①Use floating type tap holder. ②Avoid runout of spindle.
	Galling	①Select surface-treatment (steam oxide or coating). ②Select tap with oil hole.	①Apply steam oxide treatment. ②Adjust rake angle to suit tapped material. ③Shorten thread length of tap.			
	Incorrect tap regrinding			①The land must be accurately indexed. ②Reduce run-out of chamfer section. ③Make sure that rake angle and primary relief angle are not too large. ④Make sure that land width is not excessively thin. ⑤Remove burrs.		
Undersize Pitch Diameter	Incorrect tap selection	Select oversize tap. (a)Tapping material: Materials with low over size margin, such as copper alloy, aluminum alloy and cast iron (b)Shape of tapping material: Hollow materials and mild sheet steels with punched holes which have "a spring back" action after tapping	①Adjust primary relief angle to appropriate level. ②Increase rake angle.	Shorten regrinding intervals.		
	Damaged internal thread					
	Left-over chips		Improve sharpness of cutting edges to prevent spare chips.			
Torn or rough Thread	Incorrect tap selection	Select tap with long chamfer length.	①Adjust rake angle to suit tapped material. ②Reduce margin width. ③Shorten effective thread length.			
	Galling	①Select tap with thread relief. ②Select surface-treatment (steam oxide or coating). ③Select tap with oil hole.	①Reduce land width. ②Shorten effective thread length.	①The flutes must be accurately indexed. ②Reduce runout of rake angle. ③Pay special attention to heat build up on the cutting edge.		
	Chip packing	Select spiral pointed or spiral fluted taps.				

Operating Conditions		Work Material			Other
Tapping Conditions	Cutting Lubricant	Hardness	Dimension	Drill Hole	
	Change lubricant type and lubricating method.			①Make drill hole diameter as large as possible. ②In the case of blind holes, make it as deep as possible.	
①Adjust tapping speed to appropriate level. ②Adjust feed speed to appropriate level to prevent torn or rough thread. ③Use forced feed (lead feed) tapper.				①Prevent misalignment with drill hole. ②Chamfer entrance of the drilled hole.	
①Reduce tapping speed.	Replace lubricant with one that has higher anti-galling properties.				
			Select oversize tap. (a)Tapping material: Materials with low over size margin, such as copper alloy, aluminum alloy and cast iron (b)Shape of tapping material: Hollow materials and mild sheet steels with punched holes which have a "spring back" action after tapping.		
Adjust reverse speed to an appropriate level, to avoid damage at entrance of tapped thread on the way out of the hole.					
					Before gauge check, be sure to remove chips completely.
Reduce tapping speed.	①Review lubricant type and lubricating supply method. ②Correct lubricant change/replenishment intervals. ③Prevent entry of other oils such as operating oil. ④Filtrate oil stored in tank.			Make drill hole diameter as large as possible.	Remove chips generated in previous process.
Make drill hole as large as possible.	Review lubricant type and lubricating method.			Make drill hole diameter as large as possible.	

TROUBLE SHOOTING

Problem		Tap			Operating Conditions	
	Specific Problem	Selection	Designed Spec.	Regrinding	Machine Used	Tooling
Torn or rough Thread	Incorrect operating conditions				Switch to pitch feed mode.	①Avoid runout of spindle. ②Use a floating type tap holder.
	Incorrect tap regrinding			①The land must be accurately indexed. ②Reduce run-out of chamfer section. ③Make sure these are no worn-out areas. ④Shorten regrinding intervals.		
Jagged Thread	Incorrect tap selection		①Reduce rake angle. ②Reduce amount of thread relief.	①Make sure that land width is not excessively thin. ②Do not regrind flutes.		①Use a floating type tap holder. ②Avoid runout of spindle.
Breakage	Chip packing	Use spiral pointed, spiral fluted or forming taps	①Enlarge chip room ②Increase chamfer length.			
	Galling	Select surface-treatment (steam oxide or coating).		Make sure there are no worn-out areas.		
	Excessive tapping torque	Select tap with long chamfer length.	①Increase rake angle to improve cutting sharpness. ②Increase amount of thread relief and reduce land width to reduce friction torque.	①Make sure there are no worn-out areas. ②Shorten regrinding intervals.		
	Incorrect operating conditions				Avoid inconsistent feed rate	①Use a tap holder that has torque adjustment function. ②Use a floating type tap holder.
Chipping	Incorrect tap selection		①Reduce thread length. ②Change tool material. ③Reduce hardness of the tap. ④Increase chamfer length.	①Make sure there are no worn-out areas. ②Make sure that land width is not excessively thin.		
	Incorrect operating conditions				Avoid inconsistent feed rate	①When tapping hole, do not reverse rotation suddenly. ②Use floating type tap holder.
Excessive Wear	Incorrect tap selection	①Select surface-treatment (steam oxide or coating). ②Select High-Speed Steel tap that contains high vanadium or powder metal tap.	If tapping material is hard, improve tool material or apply surface treatment.	①Make sure that rake angle is not too large. ②Avoid tapping burn.		
	Incorrect operating conditions					
Galling	Excessive frictional heat		①Increase amount of thread relief. ②Reduce land width.			

Operating Conditions		Work Material			Other
Tapping Conditions	Cutting Lubricant	Hardness	Dimension	Drill Hole	
	Review lubricant type and lubricating method.	Pay special attention to changes and variations in tapping material, hardness and structure.		①Avoid misalignment and inclination from drilled hole. ②Avoid work hardening of the hole after tapping.	
Reduce tapping speed.	Review lubricant type and lubricating method.		①Hold work material more securely. ②Pay special attention to thickness of work material.		
				①Make hole for blind hole as deep as possible. ②Correct inclination of drilled hole.	①Remove chips collected in drilled hole and around tapping areas in previous process. ②Keep space for removal of chips.
①Reduce tapping speed. ②Avoid misalignment between tap and drilled hole as well as inclination of drilled hole. ③Avoid hitting bottom of the drilled hole with tap.		Pay special attention to changes and variations in tapping material, hardness and structure.		①Avoid misalignment and inclination from drilled hole. ②Avoid work hardening of the hole after tapping. ③Remove chips generated in previous process.	
①Reduce tapping speed. ②Avoid misalignment between tap and drilled hole as well as inclination of drilled hole.	Use lubricant that has higher anti-galling properies.	Pay special attention to changes and variations in tapping material, hardness and structure.		①Avoid misalignment and inclination from drilled hole. ②Avoid work hardening of the hole after tapping.	
①Reduce tapping speed. ②Avoid work hardening of the hole after tapping.	Review lubricant type and lubricating method.	Pay special attention to changes and variations in tapping material, hardness and structure.		①Make hole as large as possible. ②In the case of a blind hole, make it as deep as possible. ③Avoid work hardening of the hole after tapping.	
Reduce tapping speed.	①Review lubricant type and lubricating method. ②Correct lubricant change/replenishment intervals. ③Prevent entry of other oils such as operating oil. ④Filtrate oil stored in tank.				