Think threads with YAMAWA

No.001

How to solve a bad surface finish on PT pipe thread by changing the tapping speed

Pipe taps

【Question】

I am tapping pipe threads with a Taper Pipe Tap Rc(PT) on a machining center. I am worrying about Torn Surface Finish and Thread Chatter. Is there any improvement you can offer for this problem?

【Answer】

Try to change the tapping speed or RPM.
You can improve the situation of the existing Torn Surface Finish and Thread Chatter by decreasing the cutting speed or RPM.

【Improvement】 Let us explain Torn Surface Finish and Thread Chatter that tend to occur on tapping taper pipe threads with a taper pipe tap on a machining center.

Current tap：Tap for taper pipe threads Rc1/4-19

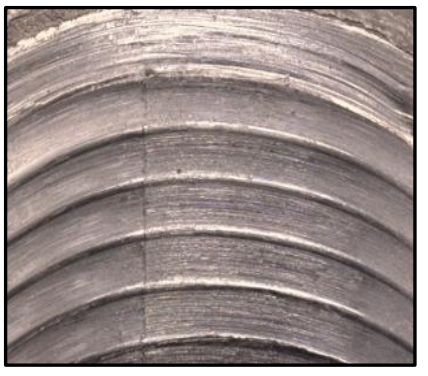
【Current tapping condition】

Material ：SS400 (A36/A283C)
Machine ：Machining center
Feed ：Full rigid type feed
Cutting oil ：Water soluble type
Cutting speed：7m/min. (196 RPM or 23SFM)

Surface of internal threads after threading

【Tapping condition after improvement】

Material ：SS400 (A36/A283C)
Machine ：Machining center
Feed ：Full rigid type feed
Cutting oil ：Water soluble type
Cutting speed：2.5m/min.（60RPM or 8SFM）



Surface of internal threads after threading with reduced speed.

I was surprized to see how big of an improvement was made in the surface finish of internal taper threads by just changing the cutting speed.
If you have a similar problem (Torn surface finish or thread chatter) in other materials than SS400, try reducing your tapping speed.

Recommended cutting speed for pipe thread tapping ----- We recommend 2-3m/min (7-10SFM.)

【Advice】

The chip thickness of a taper pipe tap Rc(PT) is much thinner than a chip produced by a tap for metric threads and tap for straight pipe thread Rp(PS). When tapping soft materials like SS400 (A36), and the tapping speed is too high, the cutting edge of the tap Rc (PT) tends to slip. This causes Torn Surface Finish and Thread Chatter problems in internal tapered threads.
If you adjust the tapping speed to 2-3m/min (7-10SFM), the cutting edge works smoothly, and there will be a great improvement in reducing Torn Surface Finish and Thread Chatter problems.

Recommending tapping speed for Rc(PT) tap and RPM of the main spindle

Size	Basic major dia. (mm)	2m/min	3m/min
		Revolution of tap (min-1)	
Rc 1/16-28	7.723	82	124
Rc 1/8-28	9.728	65	98
Rc 1/4-19	13.157	48	73
Rc 3/8-19	16.662	38	57
Rc 1/2-14	20.955	30	46
Rc 5/8-14	22.911	28	42
Rc 3/4-14	26.441	24	36

Size	Basic major dia. (mm)	2m/min	3m/min
		Revolution of tap (min-1)	
Rc 7/8-14	30.201	21	32
Rc 1'-11	33.249	19	29
Rc 1'1/8-11	37.897	17	25
Rc 1'1/4-11	41.910	15	23
Rc 1'1/2-11	47.803	13	20
Rc 1'3/4-11	53.746	12	18
Rc 2'-11	59.614	11	16