

Misumi Tap Cutting Speed and Cutting Oils

Cutting speed is affected by use conditions including tap material, type, bite thread count, pilot hole shape, work material, cutting oil and so on, requiring careful selection.

As well, cutting oil effects include lubrication, cooling, and anti-deposition, which are called the three elements of cutting oils. For tapping, because of the highly complex cutting effects, we recommend being sure to use sufficient cutting oil.

Standard cutting speed and compatible cutting oils

Work Material		Cutting Speed (m/min)						Cutting Oil				
		High-Speed Steel					Carbide	Water Insolubility	Water Solubility (immersion)	Semi-Dry	Dry	
		Hand	Spiral	Point	Roll	For Tubes						
Low-Carbon Steel	CO.25% or less	8 ~ 13	8 ~ 13	15 ~ 25	8 ~ 13	3 ~ 6	-	◎	○	△	△	
Medium Carbon Steel	CO.25 ~ 0.45%	7 ~ 12	7 ~ 12	10 ~ 15	7 ~ 10	3 ~ 6	-	◎	○	△	△	
High-Carbon Steel	CO.45% or more	6 ~ 9	6 ~ 9	8 ~ 13	5 ~ 8	2 ~ 5	-	◎	○	△	△	
Alloy Steel	SCM	7 ~ 12	7 ~ 12	10 ~ 15	5 ~ 8	2 ~ 5	-	◎	△	△	△	
Heat-Treated Steel	25 ~ 45HRC	3 ~ 5	3 ~ 5	4 ~ 6	-	2 ~ 5	-	◎	△	-	-	
Stainless Steel	SUS	4 ~ 7	5 ~ 8	8 ~ 13	5 ~ 10	3 ~ 6	-	◎	○	-	-	
Precipitation-hardened Stainless Steel	SUS630 SUS631	3 ~ 5	3 ~ 5	4 ~ 6	-	2 ~ 5	-	◎	-	-	-	
Tool Steel	SKD	6 ~ 9	6 ~ 9	7 ~ 10	-	2 ~ 5	-	◎	-	-	-	
Cast Steel	SC	6 ~ 11	6 ~ 11	10 ~ 15	-	2 ~ 5	-	◎	○	-	-	
Cast Iron	FC	10 ~ 15	-	-	-	2 ~ 5	15 ~ 25	◎	○	○	○	
Ductile Cast Iron	FCD	7 ~ 12	7 ~ 12	10 ~ 20	-	4 ~ 8	12 ~ 20	◎	○	○	-	
Copper	Cu	6 ~ 9	6 ~ 11	7 ~ 12	7 ~ 12	2 ~ 5	15 ~ 33	○	○	-	-	
Brass/Brass Casting	Bs/BsC	10 ~ 15	10 ~ 20	15 ~ 25	7 ~ 12	5 ~ 10	23 ~ 33	○	○	○	○	
Bronze/Brass Casting	PB/PBC	6 ~ 11	6 ~ 11	10 ~ 20	7 ~ 12	6 ~ 11	18 ~ 33	○	○	-	-	
Aluminum Rolled Material	Al	10 ~ 20	10 ~ 20	15 ~ 25	10 ~ 20	5 ~ 10	23 ~ 40	◎	○	△	-	
Aluminum Alloy Casting	AC/ADC	10 ~ 15	10 ~ 15	15 ~ 20	10 ~ 15	10 ~ 15	15 ~ 25	◎	○	△	-	
Cast Magnesium Alloy	MC	7 ~ 12	7 ~ 12	10 ~ 15	-	10 ~ 15	12 ~ 20	◎	○	○	-	
Zinc Alloy Casting	ZDC	7 ~ 12	7 ~ 12	10 ~ 15	7 ~ 12	10 ~ 15	12 ~ 20	◎	○	△	-	
Thermosetting plastic	Bakelite Phenol Epoxy	10 ~ 20	-	-	-	5 ~ 10	15 ~ 25	-	○	○	○	
Thermoplastic	Vinyl Chloride Nylon Duramin	10 ~ 20	10 ~ 15	10 ~ 20	-	5 ~ 10	15 ~ 25	-	○	○	○	

ⓘ This table is for general selection reference and may require changes according to use conditions.

◎ Optimal ○ Suitable △ Usable — Unusable