



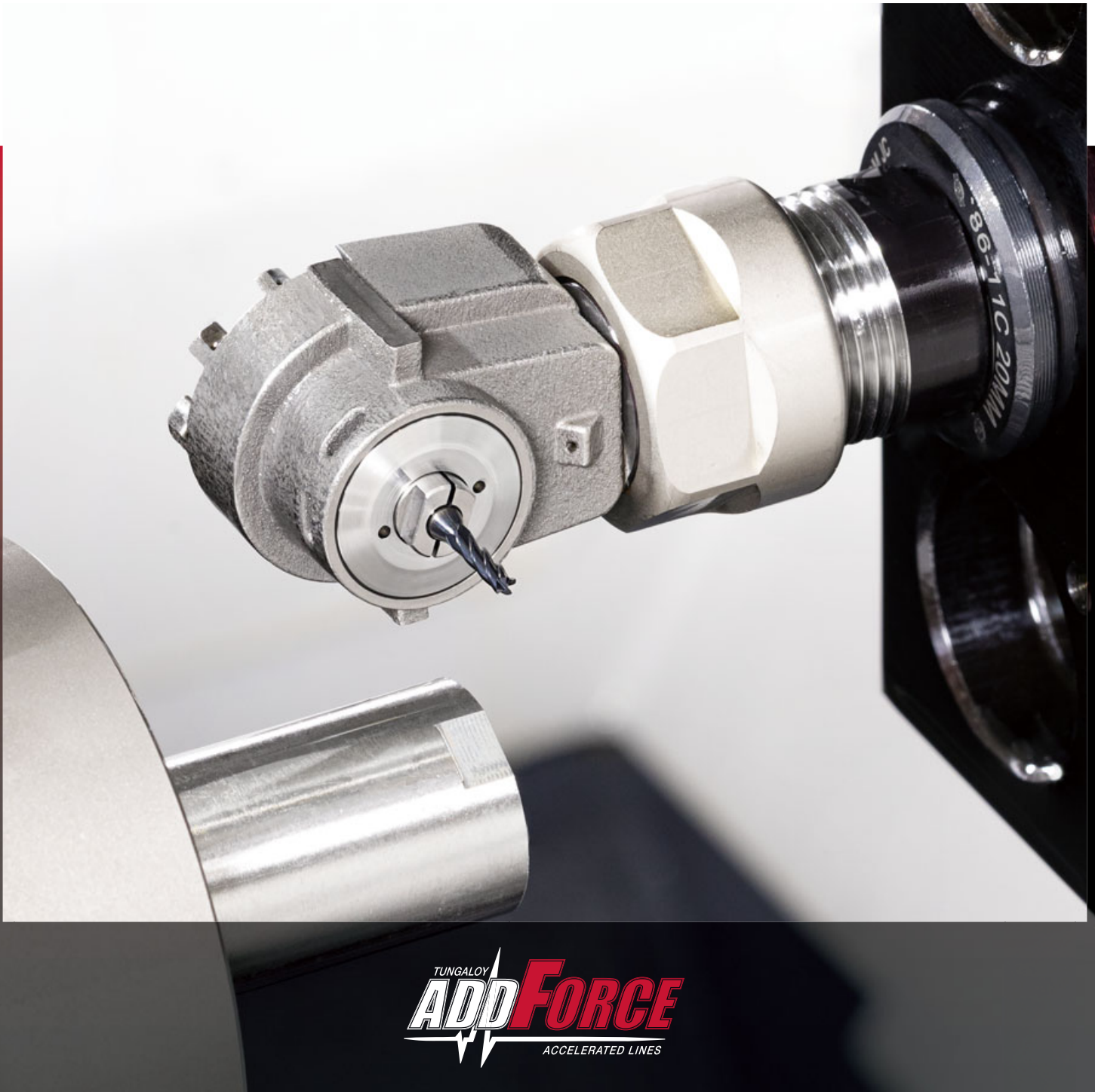
For more information

Tooling system

SPINJET

Tungaloy Report No. 428S2-G

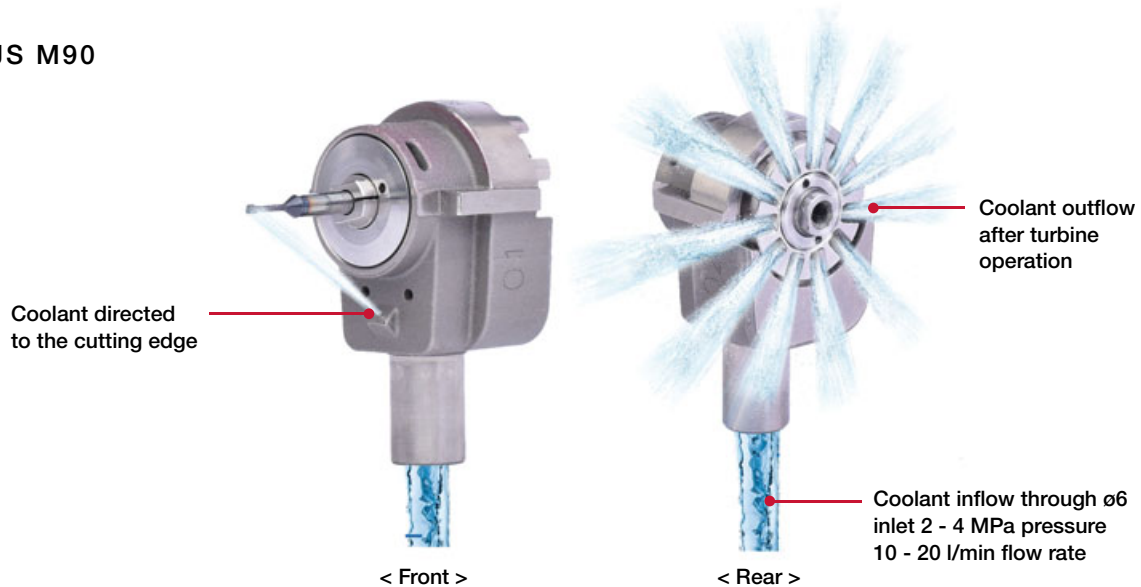
High productivity of Drilling and Milling in difficult to reach spaces



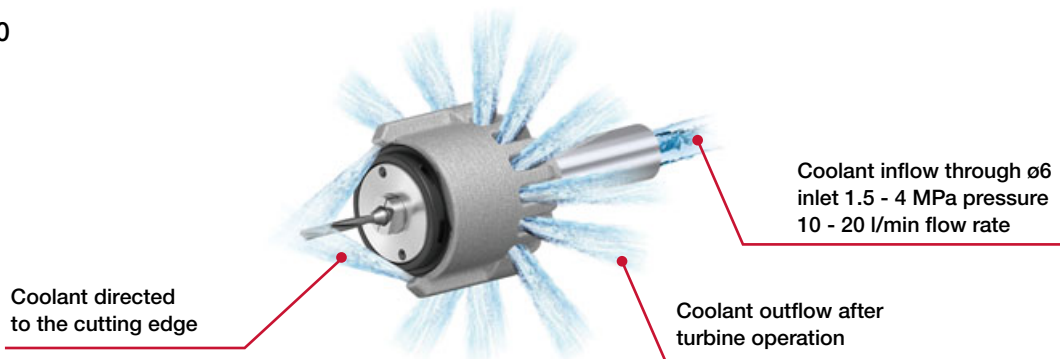
■ Spindle for high-speed machining in tight space

- Rigid and compact, ideal for machining operations in difficult-to-reach areas
- Powered by the machine's internal coolant driver system
- Suitable for small diameter semi-finishing and finishing applications
- Powerful internal coolant system

■ TJS M90



■ TJS M00



■ Prerequisites for CNC Machine

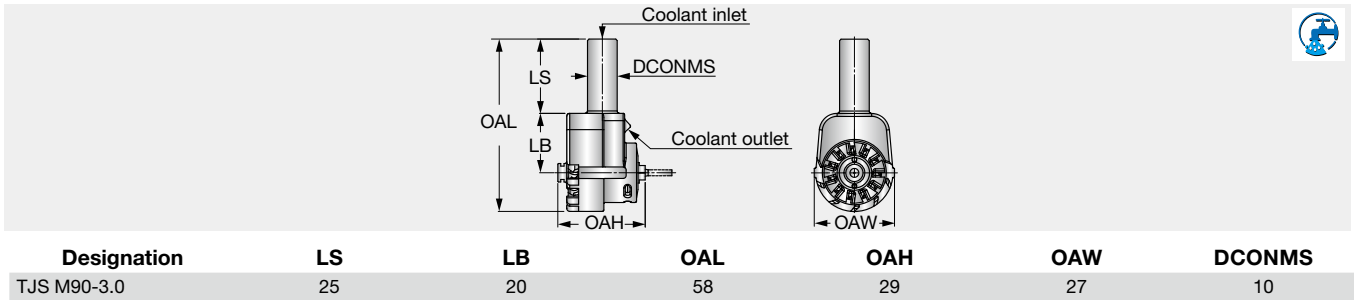
Prerequisites	SPINJET TJS M90	SPINJET TJS M00
Coolant pressure: P (MPa)	2 - 4	1.5 - 4
Flow rate: Q (l/min)	10 - 20	10 - 20
No. of revolutions: n (min^{-1})	35,000 - 53,000	18,000 - 40,000
Tool diameter: DC (mm)	Drilling: 0.5 - 2	Drilling: 0.1 - 2
	Milling: 1.5 - 3.5	Milling: 0.3 - 3
Max. shank diameter: DCONMS (mm)	3.175	3.175

These are approximate revolution values, depending on coolant pressure, flow rate, and type.

SPINDLES

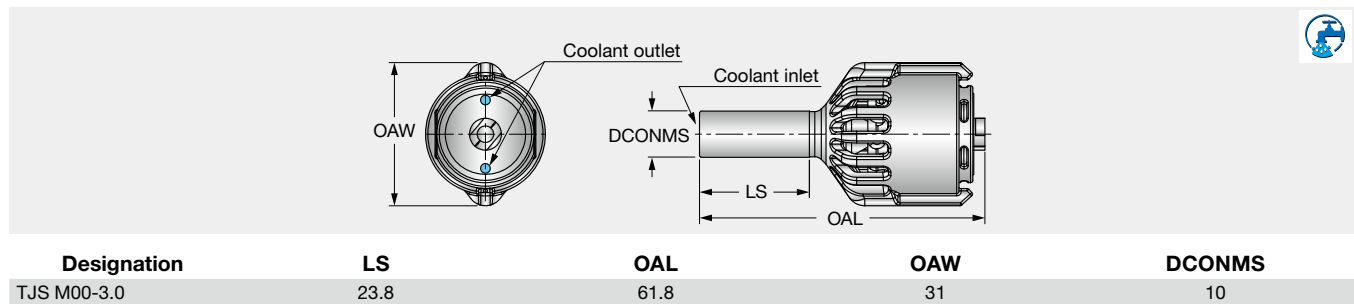
TJS M90

High-pressure coolant driven HSM spindle with a straight shank for small diameter cutting tools, angular head type



TJS M00

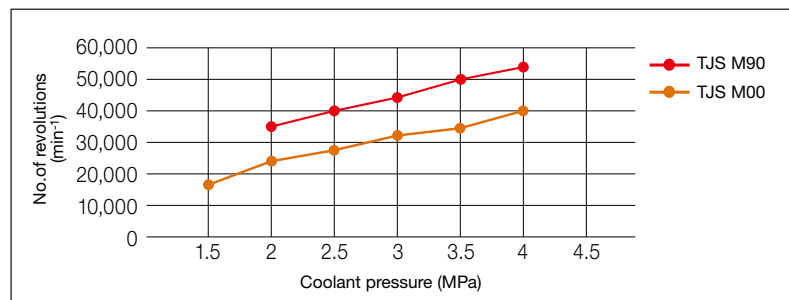
High-pressure coolant driven HSM spindle with a straight shank for small diameter cutting tools



SPARE PARTS

Designation	TJS collet 1	TJS collet 2 (Optional)	TJS collet 3 (Optional)	TJS collet 4 (Optional)	TJS MJ wrench	TJS MJ lock
TJS M90-3.0	TJS-COLLET 3.0	(TJS-COLLET 1.6)	(TJS-COLLET 2.0)	(TJS-COLLET 1/8)	TJS MJ90 WRENCH-2430	-
TJS M00-3.0	TJS-COLLET 3.0	(TJS-COLLET 1.6)	(TJS-COLLET 2.0)	(TJS-COLLET 1/8)	TJS MJ-WRENCH-COLLET	TJS MJ-SHAFT-LOCK

MPa	Idle Speed min ⁻¹	
	M90	M00
1.5	-	18,000
2	35,000	23,000
2.5	40,000	27,000
3	44,000	31,000
3.5	50,000	34,000
4	53,000	40,000

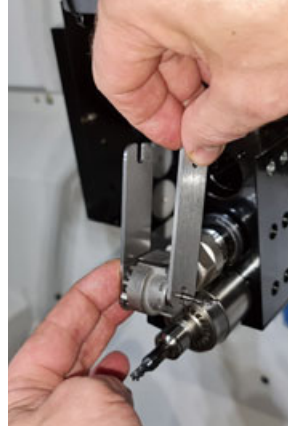


INSTRUCTIONS

■ TJS M90



❶ Hold the rear spindle with a wrench so that the shaft does not rotate



❷ After inserting the collet and tool into the spindle, tighten the collet to secure it

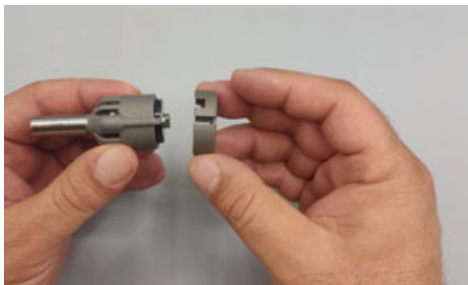


❸ Use the indicator to check the parallelism of the grinding face on the spindle housing and the machine

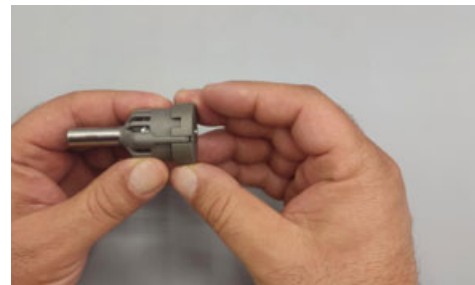


❹ Tighten the collet nut to secure the TJS M90 angular head to the holder

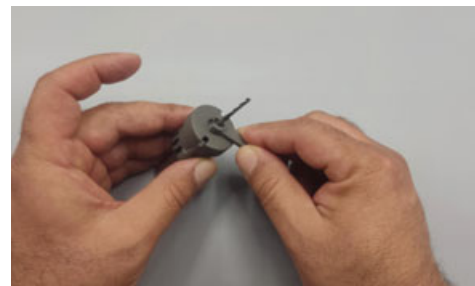
■ TJS M00



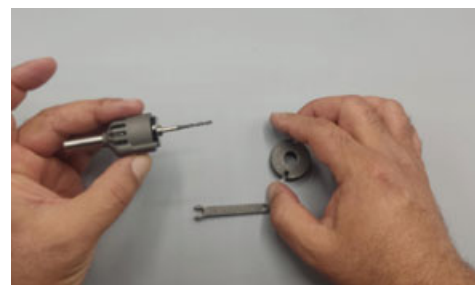
❶ Hold the spindle with the lock key so that the shaft does not rotate



❷ After inserting the tool into the collet, tighten the collet to secure it



❸ Remove the lock key and use the tool assembled TJS M00 spindle



STANDARD CUTTING CONDITIONS

■ TJS M90

ISO	Workpiece material	Tool	Application	Tool diameter DC (mm)	Coolant pressure (MPa)	Spindle speed n (min ⁻¹)	Width of cut a_e (mm)	Depth of cut a_p (mm)	Feed per tooth f_z (mm/t)
P	Alloy steel 35 HRC	Drill	Drilling	0.5	1.5	18,000	-	-	0.007
					2	23,000	-	-	0.01
					3	31,000	-	-	0.01
					4	40,000	-	-	0.01
				1	1.5	18,000	-	-	0.01
					2	23,000	-	-	0.01
					3	31,000	-	-	0.01
					4	40,000	-	-	0.01
				2	1.5	18,000	-	-	0.01
					2	23,000	-	-	0.01
					3	31,000	-	-	0.01
					4	40,000	-	-	0.01
		Ball type endmill	Profiling	1	1.5	18,000	-	0.05	0.003
					2	23,000	-	0.05	0.003
					3	31,000	-	0.05	0.003
					4	40,000	-	0.05	0.003
				2	1.5	18,000	-	0.08	0.004
					2	23,000	-	0.08	0.004
					3	31,000	-	0.08	0.004
					4	40,000	-	0.08	0.004
				3	1.5	18,000	-	0.1	0.006
					2	23,000	-	0.1	0.006
					3	31,000	-	0.1	0.006
					4	40,000	-	0.1	0.006
		Endmill	Slotting	1	1.5	18,000	1	0.1	0.006
					2	23,000	1	0.1	0.006
					3	31,000	1	0.1	0.006
					4	40,000	1	0.15	0.006
				2	1.5	18,000	2	0.12	0.01
					2	23,000	2	0.12	0.01
					3	31,000	2	0.14	0.01
					4	40,000	2	0.14	0.01
				3	1.5	18,000	3	0.12	0.01
					2	23,000	3	0.12	0.01
					3	31,000	3	0.12	0.01
					4	40,000	3	0.15	0.01
2	1.5			18,000	0.5	0.5	0.002		
	2			23,000	0.5	0.5	0.014		
	3			31,000	0.5	0.5	0.017		
	4			40,000	0.5	0.5	0.018		

■ TJS M90

ISO	Workpiece material	Tool	Application	Tool diameter DC (mm)	Coolant pressure (MPa)	Spindle speed n (min ⁻¹)	Width of cut a_e (mm)	Depth of cut a_p (mm)	Feed per tooth f_z (mm/t)		
M	Stainless steel 180 - 250 HB	Drill	Drilling	0.5	1.5	18,000	-	-	0.015		
					2	23,000	-	-	0.015		
					3	31,000	-	-	0.015		
					4	40,000	-	-	0.015		
				1	1.5	18,000	-	-	0.015		
					2	23,000	-	-	0.015		
					3	31,000	-	-	0.015		
					4	40,000	-	-	0.015		
				2	1.5	18,000	-	-	0.015		
					2	23,000	-	-	0.015		
					3	31,000	-	-	0.015		
					4	40,000	-	-	0.015		
				Endmill	Slotting	1	1.5	18,000	1	0.1	0.015
							2	23,000	1	0.1	0.015
							3	31,000	1	0.15	0.015
							4	40,000	1	0.15	0.015
		2	1.5			18,000	2	0.15	0.015		
			2			23,000	2	0.15	0.015		
			3			31,000	2	0.15	0.015		
			4			40,000	2	0.2	0.015		
		Shouldering	2		1.5	18,000	0.35	0.15	0.02		
					2	23,000	0.35	0.15	0.02		
					3	31,000	0.4	0.15	0.02		
					4	40,000	0.5	0.18	0.025		
		N	Aluminium alloy 80 - 160 HB	Drill	Drilling	0.5	1.5	18,000	-	-	0.01
							2	23,000	-	-	0.01
							3	31,000	-	-	0.01
							4	40,000	-	-	0.01
1	1.5					18,000	-	-	0.01		
	2					23,000	-	-	0.01		
	3					31,000	-	-	0.01		
	4					40,000	-	-	0.01		
2	1.5					18,000	-	-	0.015		
	2					23,000	-	-	0.015		
	3					31,000	-	-	0.017		
	4					40,000	-	-	0.018		
Ball type endmill	Profiling					1	1.5	18,000	-	0.05	0.003
							2	23,000	-	0.05	0.003
							3	31,000	-	0.05	0.003
							4	40,000	-	0.13	0.003
				2	1.5	18,000	-	0.08	0.004		
					2	23,000	-	0.08	0.004		
					3	31,000	-	0.08	0.004		
					4	40,000	-	0.15	0.004		
	3			1.5	18,000	-	0.08	0.006			
				2	23,000	-	0.09	0.006			
				3	31,000	-	0.09	0.006			
				4	40,000	-	0.15	0.006			
	Endmill			Slotting	1	1.5	18,000	1	0.1	0.025	
						2	23,000	1	0.1	0.025	
						3	31,000	1	0.15	0.025	
						4	40,000	1	0.15	0.025	
2				1.5	18,000	2	0.2	0.025			
				2	23,000	2	0.2	0.025			
				3	31,000	2	0.2	0.025			
				4	40,000	2	0.2	0.025			
Shouldering	2	1.5	18,000	0.5	0.25	0.02					
		2	23,000	0.5	0.25	0.02					
		3	31,000	0.5	0.5	0.02					
		4	40,000	0.5	0.5	0.025					

■ TJS M00

ISO	Workpiece material	Tool	Application	Tool diameter DC (mm)	Coolant pressure (MPa)	Spindle speed n (min ⁻¹)	Width of cut a_e (mm)	Depth of cut a_p (mm)	Feed per tooth f_z (mm/t)
P	Pre-hardened steel 35 HRC	Drill	Drilling	0.5	2	35,000	-	-	0.01
					3	44,000	-	-	0.01
					4	53,000	-	-	0.01
				1	2	35,000	-	-	0.01
					3	44,000	-	-	0.01
					4	53,000	-	-	0.01
				2	2	35,000	-	-	0.01
					3	44,000	-	-	0.01
					4	53,000	-	-	0.01
		Ball type endmill	Profiling	1	2	35,000	-	0.05	0.003
					3	44,000	-	0.05	0.003
					4	53,000	-	0.05	0.003
				2	2	35,000	-	0.08	0.004
					3	44,000	-	0.08	0.004
					4	53,000	-	0.08	0.004
				3	2	35,000	-	0.1	0.006
					3	44,000	-	0.1	0.006
					4	53,000	-	0.1	0.006
		Endmill	Slotting	0.5	2	35,000	0.5	0.05	0.006
					3	44,000	0.5	0.05	0.006
					4	53,000	0.5	0.05	0.006
				1	2	35,000	1	0.1	0.006
					3	44,000	1	0.1	0.006
					4	53,000	1	0.15	0.006
				2	2	35,000	2	0.12	0.01
					3	44,000	2	0.14	0.01
					4	53,000	2	0.14	0.01
				3	2	35,000	3	0.12	0.01
					3	44,000	3	0.12	0.01
					4	53,000	3	0.15	0.01
Shouldering	Shouldering			2	2	35,000	0.5	0.5	0.001
					3	44,000	0.5	0.5	0.017
					4	53,000	0.5	0.5	0.018
M	Stainless steel SUS 316 35 HRC	Drill	Drilling	0.5	2	35,000	-	-	0.015
					3	44,000	-	-	0.015
					4	53,000	-	-	0.015
				1	2	35,000	-	-	0.015
					3	44,000	-	-	0.015
					4	53,000	-	-	0.015
				2	2	35,000	-	-	0.015
					3	44,000	-	-	0.015
					4	53,000	-	-	0.015
		Endmill	Slotting	1	2	35,000	1	0.1	0.015
					3	44,000	1	0.15	0.015
				2	4	53,000	1	0.15	0.015
					2	35,000	2	0.15	0.015
				2	3	44,000	2	0.15	0.015
					4	53,000	2	0.2	0.015
Shouldering	Shouldering	2	2	35,000	0.35	0.15	0.02		
			3	44,000	0.4	0.15	0.02		
			4	53,000	0.5	0.18	0.025		

■ TJS M00

ISO	Workpiece material	Tool	Application	Tool diameter DC (mm)	Coolant pressure (MPa)	Spindle speed n (min ⁻¹)	Width of cut a_e (mm)	Depth of cut a_p (mm)	Feed per tooth f_z (mm/t)		
N	Aluminium alloy ADC12 28 HRC	Drill	Drilling	0.5	2	35,000	-	-	0.01		
					3	44,000	-	-	0.01		
					4	53,000	-	-	0.01		
				1	2	35,000	-	-	0.01		
					3	44,000	-	-	0.01		
					4	53,000	-	-	0.01		
				2	2	35,000	-	-	0.015		
					3	44,000	-	-	0.017		
					4	53,000	-	-	0.018		
				Ball type endmill	Profiling	1	2	35,000	-	0.05	0.003
							3	44,000	-	0.05	0.003
							4	53,000	-	0.13	0.003
		2	2			35,000	-	0.08	0.004		
			3			44,000	-	0.08	0.004		
			4			53,000	-	0.15	0.004		
		3	2			35,000	-	0.08	0.006		
			3			44,000	-	0.09	0.006		
			4			53,000	-	0.15	0.006		
		Endmill	Slotting			0.5	2	35,000	0.5	0.1	0.02
							3	44,000	0.5	0.12	0.02
							4	53,000	0.5	0.15	0.02
				1	2	35,000	1	0.1	0.025		
					3	44,000	1	0.15	0.025		
					4	53,000	1	0.15	0.025		
2	2		35,000	2	0.2	0.025					
	3		44,000	2	0.2	0.025					
	4		53,000	2	0.2	0.025					
Shouldering	2		2	35,000	0.5	0.25	0.02				
			3	44,000	0.5	0.5	0.02				
			4	53,000	0.5	0.5	0.025				
H	Tool steel SKD61 58 HRC	Ball type endmill	Profiling	1	2	35,000	-	0.05	0.005		
					3	44,000	-	0.05	0.005		
					4	53,000	-	0.05	0.005		
				2	2	35,000	-	0.07	0.006		
					3	44,000	-	0.08	0.006		
					4	53,000	-	0.08	0.006		
				3	2	35,000	-	0.08	0.006		
					3	44,000	-	0.1	0.006		
					4	53,000	-	0.1	0.006		



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