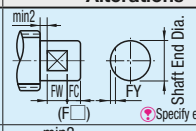
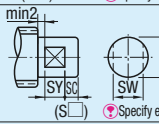
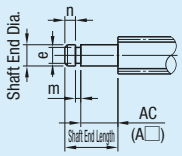
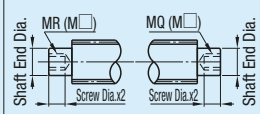
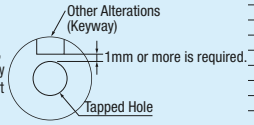
Lead Screw Shaft End Machining - Overview

Orders can be placed without drawings by adding the Alteration Specifications listed below to the standard lead screw product part numbers. Procurement is quick with short lead time.

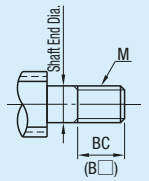
On the table below, the "□" portion of F□ and so on will contain the V, Q, R, E or C code which indicates which shaft part to add alterations to.

Alteration Items	Alterations	Code	Spec.
Flat Machining	 Specify each dimension	F□ FV FQ FR FE FC	Adds a flat on a shaft end. Usage: Used for a set screw flat when mounting a handle. Ordering Code: FC5-FW10-FY1 0.5mm Increment Only one end of the shaft is machined When shaft end diameter ≤25, FY≤1.0 When shaft end diameter ≥26, FY≤2.0 3≤FW≤20 F□=0, or F□≥2
2 Flats Machining	 Specify each dimension	S□ SC SQ SE SR SV	2 flats (wrench flats) are machined on one end of the shaft Usage: For wrench use Ordering Code: SC5-SW10-SY8 1mm Increment Only one end of the shaft is machined When shaft end O.D. <15, SW≥ end O.D. -2 When 15≤ shaft end O.D. ≤25, SW ≥ end O.D. -3 When 30≤ shaft end O.D., SW≥ end O.D. -5 3≤SY≤20 S□=0, or S□≥2
Retaining Ring Groove	 Specify dimensions after A□	A□ AC AQ AR AE	Adds a retaining ring groove on a shaft end. Usage: For bearing mounting, etc. Ordering Code: AC13.3 0.1mm increment AC (AQ, AR, AE) ≤ Shaft End Length-**m-n** For the m,n value, see the table on the right. (For the m value, consider the tolerance.)

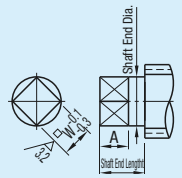
Shaft End Dia.	e Tolerance		m+0.14 0	n Machining Limit	Retaining Ring
6	4	+0.075 0	0.7	n≥1.2	E-Shaped Retaining Ring
7					
8	5				
9	6		0.9		
10	9.6	0 -0.09	1.15	n≥1.5	C-Shaped Retaining Ring
12	11.5	0 -0.11			
14	13.4				
15	14.3				
16	15.2				
17	16.2				
20	19	0 -0.21	1.35		
25	23.9				
30	28.6		1.65		
35	33				
40	38	0 -0.25	1.9	n≥2	

Alteration Items	Alterations	Code	Spec.
Coarse Tapping	 Select Tap Dia. after M□	M□ MC MQ MR ME MV	Adds a coarse threaded tapped hole on the shaft end. Usage: Used for mounting threaded item (knobs, etc.) Ordering Code: MC24 Select from table on the right. Not applicable to 4mm dia. shafts When combined with an other alteratuion, do not specify this alteration in such a way that the shaft thickness on the tapped part becomes less than 1mm. 

Shaft End Dia.	MC (M□): Tap Dia. Selection Range
5	3
6	3
7, 8	3, 4
9, 10	3, 4, 5
11, 12	3, 4, 5, 6
13~15	3, 4, 5, 6, 8
16~18	3, 4, 5, 6, 8, 10
19~24	3, 4, 5, 6, 8, 10, 12
25~30	3, 4, 5, 6, 8, 10, 12, 16
31~39	3, 4, 5, 6, 8, 10, 12, 16, 20
40, 50	3, 4, 5, 6, 8, 10, 12, 16, 20, 24, 30

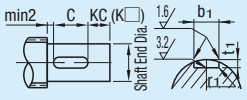
Alteration Items	Alterations	Code	Spec.
For Bearing Nut Threaded for Bearing Nuts	 Specify Tap Length after B□	B□ BV BC BQ BR	Cuts a thread on the shaft end. Usage: For locking bearing nuts Ordering Code: BC20 Select from table on the right. Nut Detail ☞P.1036 Shaft end diameters applicable to 7, 9, 16 are not available. B□ (Tap Length) ≤ Shaft End Dia. x 3 B□ (Tap Length) ≥ Pitch x 3 B□ (Tap Length) ≤ Shaft End Length - Pitch x 3

Shaft End Dia.	MxPitch
6	M 6x0.75
8	M8x1.0
10	M10x1.0
12	M12x1.0
14	M14x1.0
15	M15x1.0
17	M17x1.0
20	M20x1.0
25	M25x1.5
30	M30x1.5
35	M35x1.5
40	M40x1.5

Alteration Items	Alterations	Code	Spec.
Square Machining	 Specify W and A dimensions after Z□	Z□ ZC ZQ ZE ZR ZV	Adds square chamfering on a shaft end. Usage: For mounting handles, etc. Ordering Code: ZC12-W10-A8 Specify ZC (Z□) as same as the end diameter W=Select from the table on the right, or specify in 1mm increment A=1mm Increment 5≤A≤20 Only one end of the shaft is machined

Shaft End Dia.	W 1mm Increment
6, 7	5
8	6
9	7
10	8
12	9 10
14, 15	10 11 12
16	11 12 13
17	12 13 14
20	14 15 16
25	17~20
30	21~24
35	25~28
40	29~30

Shaft End Dia.	W 1mm Increment
6~10	5~8
11~14	8~10
15~19	10~14
20~25	14~20
26~30	19~24
31~35	22~28
36~40	26~30

Alteration Items	Alterations	Code	Spec.
Keyway	 Specify each dimension after K□	K□ KC KQ KV KE KR	Adds a keyway on a shaft end. Usage: For handle mounting keyway use Ordering Code: KC8-C10 KC (K□) and C: Specify in 1mm increment Only one end of the shaft is machined C≤60,C≥t1 KC (K□)≥2, or KC (K□)=0 When KC (K□)=0, keyway R will be eliminated on the end side. 

Applicable Shaft End Dia.	Keyway Dimension b1 Reference Dimension	b1 Tolerance (N9)	t1 Reference Dimension	t1 Tolerance	r1
6・7	2	-0.004 -0.029	1.2	+0.1 0	0.08 ~0.16
8~10	3		1.8		
11・12	4	0 -0.030	2.5		0.16 ~0.25
13~17	5		3		
18~22	6		3.5		
23~30	8	0 -0.036	4	+0.2 0	0.25 ~0.40
31~38	10		5		
39, 40	12	0 -0.043	5		

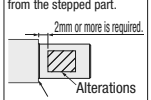
Notes on Selecting Alterations

① Specify an alteration position to be 2mm or more away from the stepped part. (See Diagram Note ①.)
② When adding multiple alterations, there must be 2mm or more clearance between each feature. (See Diagram Note ②.)
③ When flat machining, wrench flats, square chamfering and keyway alterations are combined with each other, their orientations will be random. (See Diagram Note ③.)
④ When two or more features are specified on a shaft, some alterations may not be possible due to their correlations.
⑤ Do not specify multiple alterations in such a way that they overlap with each other in the rotating direction on the same shaft. (See Diagram Note ⑤.)

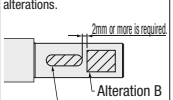
Conditions Applied to Lead Screws with Alterations for Combination of Square Chamfering and Tapping. Applied to Lead Screws on **P803~807**.

Square Chamfering		Coarse Tapping
Shaft End Dia.	Square Machining	Tap Dia.
6~10	5~8	3
11~14	8~10	3, 4
15~19	10~14	3, 4, 5
20~25	14~20	3, 4, 5, 6, 8
26~30	19~24	3, 4, 5, 6, 8, 10
31~35	22~28	3, 4, 5, 6, 8, 10, 12
36~40	26~30	3, 4, 5, 6, 8, 10, 12, 16

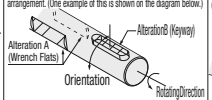
Note①
Specify an alteration portion to be 2mm or more away from the stepped part.



Note②
2mm or more is required for the clearance between multiple alterations.

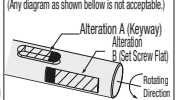


Note③
When the multiple alterations are combined each other, their orientations are random and thus, are not always aligned in a linear arrangement. (One example of this is shown on the diagram below.)



For Alterations A and B added to the same shaft, as shown on the diagram above, their orientations are random and thus, there are some cases where they are not aligned in a linear arrangement.

Note⑤
Do not specify multiple alterations in such a way that they overlap with each other on the same shaft. (Any diagram as shown bellow is not acceptable.)



Overlapped portion of Alterations A and B