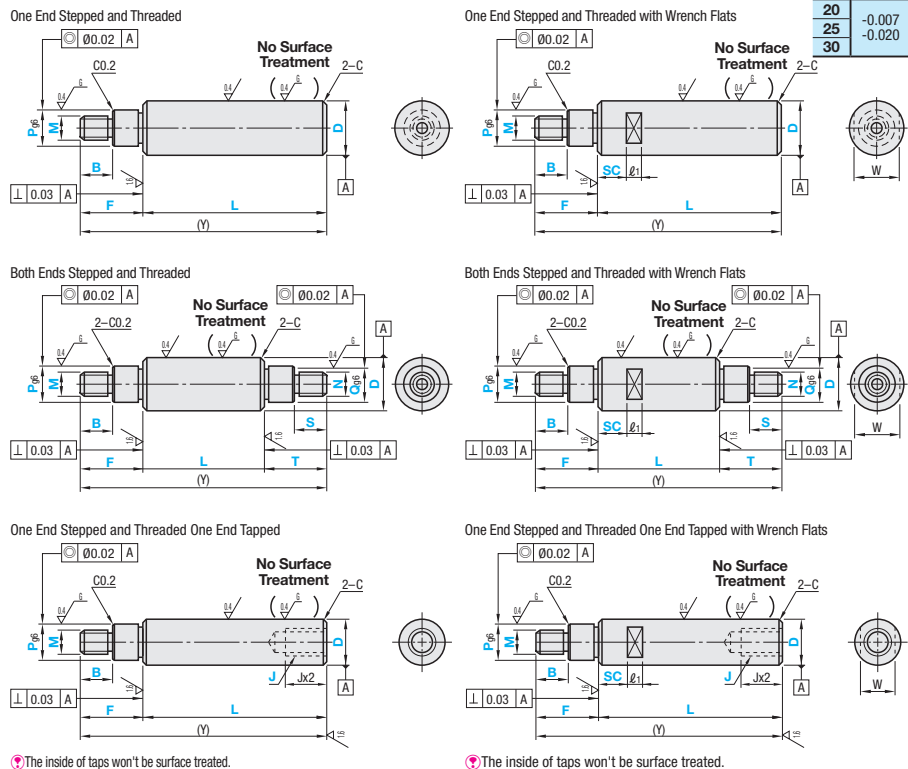


# High Precision Linear Shafts - Stepped Ends / Stepped Ends with Wrench Flats

## One End Threaded / Both Ends Threaded / One End Threaded / One End Tapped

■ Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end ( $\perp 0.03$ ).

Type						D Tol.	Material	Hardness	Surface Treatment
One End Stepped and Threaded		Both Ends Stepped and Threaded		One End Stepped and Threaded One End Tapped					
W/o Wrench Flats	With Wrench Flats	W/o Wrench Flats	With Wrench Flats	W/o Wrench Flats	With Wrench Flats	Dg6	SUS440C or 13Cr stainless	Effective Hardened Depth of Induction Hardening $\geq$ P112 SUS440C or 13Cr stainless 58HRC- SUS440C or 13Cr stainless 56HRC- Low Temp. Black Chrome Plating	
VFAN	VFPN	VFAM	VFPM	VFAD	VFPD				
VSFAN	VSPFN	VSFAM	VSPFM	VSFAD	VSPFD				
VRAN	VRPN	VRAM	VRPM	VRAD	VRPD				
VSRAN	VSRPN	VSRAM	VSRPM	VSRAD	VSRPD				



- ⊕ Annealing required for wrench flats machining and shaft end threading (effective thread length + approx. 10mm) may lower hardness.  $\geq$  P112
- ⊕ L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness  $\geq$  P111
- ⊕ Shafts may have centering holes at end faces.
- ⊕ Features of Low Temp. Black Chrome Plating  $\geq$  P128
- ⊕ The inside of taps won't be surface treated.

Part Number Type	D	1mm Increment			M, N (Coarse) Selection	J (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C
		L	F, T	B, S			SC	W	$\ell_1$		
(W/o Wrench Flats) (With Wrench Flats)	(4)	25-195			3	2	-	-	-	200	0.2 or Less
VFAN VSFAN VRAN VSRAN	(5)	25-295			3 4	2,6 3	-	-	-	300	
VFPN VSPFN VRPN VSRPN	6	25-295			3 4 5	3				300	
VFAM VSFAM VRAM VSRAM	8	25-345	5sF $\leq$ Px5	B=0 S=0	3 4 5 6 8	3 4 5 6				350	
VFPM VSPFM VRPM VSRPM	10	25-345	5sT $\leq$ Nx5	M<P<D N<Q<D	5 6 8 10	4 5 6 8				350	
VFAD VSFAD VRAD VSRAD	12	25-345			5 6 8 10 12	4 5 6 8 10				350	
VFPD VSPFD VRPD VSRPD	13	25-345			5 6 8 10 12	4 5 6 8 10				350	
	15	25-345			5 6 8 10 12	4 5 6 8 10				350	
	16	25-345			5 6 8 10 12	4 5 6 8 10				350	
	18	25-345			5 6 8 10 12	4 5 6 8 10 12				350	
	20	25-445			6 8 10 12 16 20	4 5 6 8 10 12 16				450	
	25	25-445			8 10 12 16 20 24	4 5 6 8 10 12 16 20				450	
	30	25-445			8 10 12 16 20 24	6 8 10 12 16 20				450	

⊕ For VFAD, VRAD, VSFAD, VSRAD, VFPD, VSPFD, VRPD and VSRPD, overall length L requires Jx3 $\leq$ L. ⊕ F-B(T-S) $\geq$ 2 is required.

⊕ Specify M=0 when B=0; N=0 when S=0. ⊕ Sizes in ( ) are not applicable to Shafts with Wrench Flats.

Ordering Example

Part Number	L	F	B	P	M	SC
VFAN20	400	F30	B20	P10	M8	

Part Number	L	F	B	P	M	T	S	Q	N	SC
VFPN12	300	F30	B20	P10	M8	T20	S10	Q10	N6	SC10

Part Number	L	F	B	P	M	J	SC
VSFAD30	250	F50	B40	P20	M16	J20	

Part Number Type	D	Unit Price				
		Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VFAN	4					
	5					
	6					
VRAN	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number Type	D	Unit Price				
		Min. L ~ 50	L51~100	L101~200	L201~300	L301~440
VFAM	4					
	5					
	6					
VRAM	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number Type	D	Unit Price				
		Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VFAD	4					
	5					
	6					
VRAD	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Low Temp. Black Chrome Plating Additional Charge	D	Additional Price				
		Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
	4-6					
	8, 10					
	12, 13					
	15, 16					

⊕ For Low Temp. Black Chrome Plated Shafts, please add Low Temp. Chrome Plating Additional Charge below to the non-plated shafts Unit Price above.

Part Number Type	D	Unit Price				
		Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VSFAN	4					
	5					
	6					
VSRAN	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number Type	D	Unit Price				
		Min. L ~ 50	L51~100	L101~200	L201~300	L301~440
VSFAM	4					
	5					
	6					
VSRAM	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number Type	D	Unit Price				
		Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VSFAD	4					
	5					
	6					
VSRAD	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Low Temp. Black Chrome Plating Additional Charge	D	Additional Price				
		Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
	18, 20					
	25					
	30					

⊕ Features of Low Temp. Black Chrome Plating  $\geq$  P128

Alterations	Fine Thread			Fine Tap	Change the effective length of tapped part to Jx3.																																																											
	Alteration to L dimension tolerance	MMC, MMS (Fine)	NMC, NMS (Fine)																																																													
Code	LKC	MMC, MMS, NMC, NMS	JSC	ND																																																												
Spec.	Changes L tolerance. (Ordering Code) LKC ⊕ Applicable to L dimension 200 or less. $\rightarrow +0.03$ ⊕ L dimensions can be specified in 0.1mm increment for LKC. ⊕ Not applicable when D-P(Q) $\leq$ 2.	Changes the threads to fine threads shown in the table below. (MMC, NMC - Applicable to bearing nut fine thread pitches.) (MMS, NMS - Applicable to cylinder fine thread pitches.) (Ordering Code) MMC17 <table border="1"> <thead> <tr> <th>D</th> <th>MMC, MMS</th> <th>NMC, NMS</th> </tr> </thead> <tbody> <tr><td>4</td><td>3</td><td></td></tr> <tr><td>5</td><td>3 4</td><td></td></tr> <tr><td>6</td><td>3 4 5</td><td></td></tr> <tr><td>8</td><td>3 4 5 6</td><td></td></tr> <tr><td>10</td><td>4 5 6 8</td><td></td></tr> <tr><td>12</td><td>5 6 8 10</td><td>10</td></tr> <tr><td>13</td><td>5 6 8 10</td><td>10</td></tr> <tr><td>15</td><td>5 6 8 10 12</td><td>10 12</td></tr> <tr><td>16</td><td>5 6 8 10 12</td><td>10 12</td></tr> <tr><td>18</td><td>5 6 8 10 12 15</td><td>10 12 14</td></tr> <tr><td>20</td><td>6 8 10 12 15 17</td><td>10 12 14</td></tr> <tr><td>25</td><td>8 10 12 15 17 20</td><td>10 12 14 18</td></tr> <tr><td>30</td><td>8 10 12 15 17 20 25</td><td>10 12 14 18</td></tr> </tbody> </table> Pitch 0.35 0.5 0.75 1.0 1.5 1.25 1.5 ⊕ Specify M dimensions with MMC (MMS). ⊕ Specify N dimensions with NMC (NMS).	D	MMC, MMS	NMC, NMS	4	3		5	3 4		6	3 4 5		8	3 4 5 6		10	4 5 6 8		12	5 6 8 10	10	13	5 6 8 10	10	15	5 6 8 10 12	10 12	16	5 6 8 10 12	10 12	18	5 6 8 10 12 15	10 12 14	20	6 8 10 12 15 17	10 12 14	25	8 10 12 15 17 20	10 12 14 18	30	8 10 12 15 17 20 25	10 12 14 18	Changes tapped threads to fine tapped threads shown in the table below. (Ordering Code) JSC14 <table border="1"> <thead> <tr> <th>D</th> <th>JSC</th> </tr> </thead> <tbody> <tr><td>12</td><td>8</td></tr> <tr><td>13</td><td>8</td></tr> <tr><td>15</td><td>8 10</td></tr> <tr><td>16</td><td>8 10</td></tr> <tr><td>18</td><td>8 10 12</td></tr> <tr><td>20</td><td>8 10 12 14</td></tr> <tr><td>25</td><td>8 10 12 14 18</td></tr> <tr><td>30</td><td>8 10 12 14 18</td></tr> </tbody> </table> Pitch 1.0 1.25 1.5 ⊕ Specify J dimensions with JSC. ⊕ J dimension is equal to JSC. ⊕ Only applicable to V $\square$ AD, VS $\square$ AD, V $\square$ PD and VS $\square$ PD.	D	JSC	12	8	13	8	15	8 10	16	8 10	18	8 10 12	20	8 10 12 14	25	8 10 12 14 18	30	8 10 12 14 18	Change the effective length of tapped part to Jx3. (Ordering Code) ND6 (J is changed to ND) (Application Notes) Only applicable to D=10~30, N=6~20 ⊕ One End Tapped: NDx3.5+4 $\geq$ L
D	MMC, MMS	NMC, NMS																																																														
4	3																																																															
5	3 4																																																															
6	3 4 5																																																															
8	3 4 5 6																																																															
10	4 5 6 8																																																															
12	5 6 8 10	10																																																														
13	5 6 8 10	10																																																														
15	5 6 8 10 12	10 12																																																														
16	5 6 8 10 12	10 12																																																														
18	5 6 8 10 12 15	10 12 14																																																														
20	6 8 10 12 15 17	10 12 14																																																														
25	8 10 12 15 17 20	10 12 14 18																																																														
30	8 10 12 15 17 20 25	10 12 14 18																																																														
D	JSC																																																															
12	8																																																															
13	8																																																															
15	8 10																																																															
16	8 10																																																															
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25	8 10 12 14 18																																																															
30	8 10 12 14 18																																																															

⊕ The distance between wrench flats and alteration areas should be greater than 2mm for alterations.  $\geq$  P114  
 ⊕ Alterations may lower hardness. See  $\geq$  P112