Shafts

MISUMI Round Bar Lineup

For Linear Motion applications

	Shafts		
Applications	P.107~		
Related Parts	Linear Bushings P.297	Shaft Support P.229	Oil Free Bushing P.369

When Rotary Shafts are needed

	Rotary Shafts		
Applications	P.879~		
Related Parts	Bearings P.927	Timing Pulley P.1373	Coupling P.1057

When Posts are needed

	Posts		
Applications	P.2111~		
Related Parts	Strut Clamp P.2111	Stand P.2111	Shaft Collar P.263

Shafts

(O.D. Tolerance: g6 / h5 / f8)

Product Name	Page
Solid	117
Both Ends Tapped	119
Both Ends Tapped with Wrench Flats / Cross-Drilled Hole	121
One End Tapped	123
One End Tapped with Wrench Flats / Cross-Drilled Hole	125
Full Length Hardness Guaranteed - One End Tapped / Both Ends Tapped	127
Both Ends Stepped and Tapped / Both Ends Stepped	129
Both Ends Stepped and Tapped with Wrench Flats	131
One End Stepped, Both Ends Tapped / One End Stepped, One End Tapped	133
One End Stepped, Both Ends Tapped with Wrench Flats	135
One End Stepped and Tapped / One End Stepped	137
One End Stepped and Tapped with Wrench Flats	139
One End Threaded, One End Tapped	141
One End Threaded One End Tapped with Wrench Flats / Cross-Drilled Hole	143
One End Threaded One End Tapped with Undercut	145
One End Threaded One End Tapped with Undercut / Wrench Flats / Cross-Drilled Hole	147
One End Stepped and Threaded, One End Tapped	149
Both Ends Threaded with O.D. same as Shaft O.D.	151
Both Ends Threaded	153
Both Ends Threaded with Wrench Flats / Cross-Drilled Hole	155
Both Ends Threaded with Undercuts	157
Both Ends Threaded with Undercuts / Wrench Flats / Cross-Drilled Hole	159
One End Threaded with O.D. same as Shaft O.D.	161
One End Threaded	163
One End Threaded with Wrench Flats / Cross-Drilled Hole	165
One End Threaded with Undercut	167
One End Threaded with Undercut / Wrench Flats / Cross-Drilled Hole	169
One End Stepped and Threaded / Both Ends Stepped and Threaded	171
One End Stepped and Tapped, One End Threaded / One End Stepped, One End Threaded	173

Surface treatment is also applied on machined shaft ends.

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Hex Socket	179
One End Two Tapped Holes	181
With Retaining Ring Grooves	183
Keyway	185
One End Stepped Tapered	187
Tapped Pilot	189

High Precision Linear Shafts

(O.D. Tolerance: g6)

Perpendicularity ⊥ 0.03
Concentricity ◎ Ø0.02
(Threaded and Stepped)

Product Name	Page
Both Ends Tapped / Both Ends Tapped with Wrench Flats	191
One End Tapped / One End Tapped with Wrench Flats	193
Both Ends Stepped and Tapped / Both Ends Stepped and Tapped with Wrench Flats	195
One End Stepped, Both Ends Tapped / One End Stepped, Both Ends Tapped with Wrench Flats	197
One End Stepped and Tapped / One End Stepped and Tapped with Wrench Flats	199
One End Threaded One End Tapped / One End Threaded One End Tapped with Wrench Flats	201
One End Threaded One End Tapped with Undercut / One End Threaded One End Tapped with Undercut and Wrench Flats	203
Both Ends Stepped and Threaded / Both Ends Stepped and Threaded with Wrench Flats	205
One End Stepped and Threaded / One End Stepped and Threaded with Wrench Flats	205
One End Stepped and Threaded One End Tapped / One End Stepped and Threaded One End Tapped with Wrench Flats	205
Both Ends Threaded / Both Ends Threaded with Wrench Flats	207
Both Ends Threaded with Undercuts / Both Ends Threaded with Undercuts and Wrench Flats	209
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One End Threaded with Undercut / One End Threaded with Undercut and Wrench Flats	213

Hollow Shafts

(O.D. Tolerance: g6)

Product Name	Page
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One End Tapped / One End Tapped with Wrench Flats	215
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One End Threaded, One End Tapped	218
Both Ends Tapped / Both Ends Tapped with Wrench Flats	219
One End Threaded / One End Threaded with Wrench Flats	219
One End Stepped	221
Both Ends Stepped	222
One End Stepped, One End Tapped	223

Configurable Shafts

(O.D. Tolerance: g6)

Product Name	Page
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Shaft Ends Configurable - Hollow (Wide variety of shaft-end configurations are available.)	227
Continuous Support - Pre-Drilled and Tapped	224
End-Washer for Linear Shafts	228

Shafts - Selection Table

■Shaft Type Selection Table

Please use hardened shafts (g6, h5) with linear bushings, and plated shafts (f8) with oil-free bushings.

For Rotary Shafts, see Rotary Shafts on P.819 ~ 880.
For Post, see Posts on P.2161 ~ 2192.

Shape			Page
Solid		Standard	P.117
Both Ends Tapped	W/o Wrench Flats	Standard	P.119
	With Wrench Flats	Precision Type	P.191
	With Wrench Flats	Standard	P.121
One End Tapped	W/o Wrench Flats	Standard	P.123
	With Wrench Flats	Precision Type	P.193
	With Wrench Flats	Standard	P.125
One End Tapped / Both Ends Tapped, Short (Full Length Hardness Guaranteed Shafts)	W/o Wrench Flats	Standard	P.127
Both Ends Stepped and Tapped / Both Ends Stepped	W/o Wrench Flats	Standard	P.129, P.131
	With Wrench Flats	Precision Type	P.195
One End Stepped, Both Ends Tapped One End Stepped One End Tapped	W/o Wrench Flats	Standard	P.133, P.135
	With Wrench Flats	Precision Type	P.197
One End Stepped and Tapped, One End Stepped	W/o Wrench Flats	Standard	P.137, P.139
	With Wrench Flats	Precision Type	P.199
One End Threaded, One End Tapped	W/o Wrench Flats	Standard	P.141
	With Wrench Flats	Precision Type	P.201
	With Wrench Flats	Standard	P.143

Shape			Page
One End Threaded, One End Tapped with Undercut	W/o Wrench Flats	Standard	P.145
	With Wrench Flats	Precision Type	P.203
	With Wrench Flats	Standard	P.147
One End Stepped and Threaded One End Tapped	W/o Wrench Flats	Standard	P.149
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Both Ends Threaded	W/o Wrench Flats	Standard	P.153
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	With Wrench Flats	Standard	P.159
One End Threaded	W/o Wrench Flats	Standard	P.163
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	With Wrench Flats	Standard	P.165
One End Threaded with Undercut	W/o Wrench Flats	Standard	P.167
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One End Stepped and Threaded / Both Ends Stepped and Threaded	W/o Wrench Flats	Standard	P.171
	With Wrench Flats	Precision Type	P.205
One End Stepped and Tapped, One End Threaded One End Stepped, One End Threaded	W/o Wrench Flats	Standard	P.173

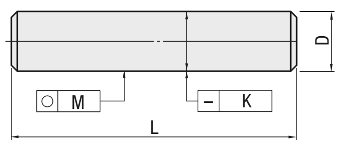
Shape			Page
Surface Treatment Fully Plated Type Surface treatment is also applied on shaft ends.		Standard	P.175
Set Screw Grooved	W/o Wrench Flats	Standard	P.177
Hex Socket Type		Standard	P.179
One End Two Tapped Holes		Standard	P.181
With Retaining Ring Grooves		Standard	P.183
Keyway		Standard	P.185
With Taper		Standard	P.187
Tapped Pilot	W/o Wrench Flats	Standard	P.189
Hollow	W/o Wrench Flats	Standard	P.215

Shape			Page
Hollow, One End Tapped	W/o Wrench Flats With Wrench Flats	Standard	P.215
Hollow, Both Ends Tapped	W/o Wrench Flats With Wrench Flats	Standard	P.219
Hollow, One End Threaded / One End Tapped	W/o Wrench Flats	Standard	P.218
Hollow, Both Ends Threaded	W/o Wrench Flats	Standard	P.217
Hollow, One End Threaded	W/o Wrench Flats With Wrench Flats	Standard	P.219
Hollow, One End Stepped	W/o Wrench Flats	Standard	P.221
Hollow, Both Ends Stepped	W/o Wrench Flats	Standard	P.222
Hollow, One End Stepped / One End Tapped	W/o Wrench Flats	Standard	P.223
Continuous Support – Pre-Drilled and Tapped		Standard	P.224
Shaft Ends Configurable Wide variety of shaft-end configurations are available.		Standard	P.225
Hollow, Shaft End Configurable Wide variety of shaft-end configurations are available.		Standard	P.227

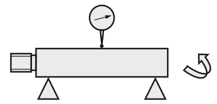
Shafts - Precision Standards

Accuracy Standards

Circularity, Straightness, L Dimension Accuracy



Straightness Measurement Method



Shaft ends are supported on V-blocks and turned 360 degrees to measure shaft runout using a dial indicator. 1/2 of measured runout is defined as the straightness.

O.D. g6, h5 Shafts (Hardened)

D Section Circularity Unit: mm

D		Circularity M
Over	or Less	
2	13	0.004
13	20	0.005
20	40	0.006
40	50	0.007

L, Y Dimension Tolerances Unit: mm

Dimension		Dimension Tolerance
Over	or Less	
2	6	±0.1
6	30	±0.2
30	120	±0.3
120	400	±0.5
400	1000	±0.8
1000	1500	±1.2

Straightness Unit: mm

D	L	Straightness K
3, 4	N/A	(L/100)x0.05 or Less
5	N/A	(L/100)x0.03 or Less
6~50	100 or Less	0.01 or Less
	Over 100	(L/100)x0.01 or Less

O.D. f8 Shafts (Not Hardened)

D Section Circularity Unit: mm

D		Circularity M
Over	or Less	
5	10	0.011
10	18	0.014
18	30	0.017
30	50	0.020

L, Y Dimension Tolerances Unit: mm

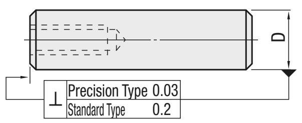
Dimension		Dimension Tolerance
Over	or Less	
3	6	±0.1
6	30	±0.2
30	120	±0.3
120	400	±0.5
400	1000	±0.8
1000	1500	±1.2

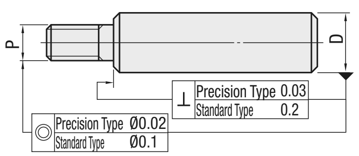
Straightness Unit: mm

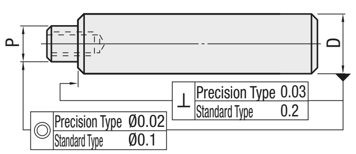
Condition L	Straightness K
L≤100	0.025 or Less
L>100	(L/100)x0.025 or Less

Concentricity, Perpendicularity

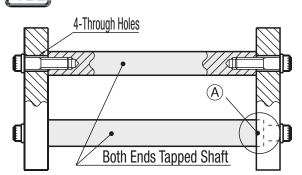
Features of Precision Shafts: Perpendicularity is ⊥ 0.03, Concentricity (Threaded and Stepped) is ◎ Ø0.02.







Example



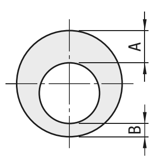
•Precision Type does not require stepped machining as Ⓐ, which enables effective assembly.

About Hollow Shaft Wall Thickness Deviations

Unit: mm

O.D. (D)	EN 1.3505 Equiv. Wall Thickness Deviation Value	EN 1.4125 Equiv. Wall Thickness Deviation Value
6	0.3 or Less	-
8	0.4 or Less	1.5 or Less
10		4.0 or Less
12		
13		
16		
20		
25	0.6 or Less	
30	1.0 or Less	
35		-
40	1.5 or Less	
50		

Hollow shaft interior surfaces are not plated, which causes rust.



Deviation Value = A-B

Thread Undercut Dimensions (PC, QC) (Reference Values)

O.D. Tolerance g6, h5 Shafts (Hardened), O.D. Tolerance f8 Shafts (Plated)

When specifying Shafts with thread undercuts or adding thread undercut alterations (PC, QC), PC and QC dimensions are as the table below. When B(S) is specified, undercut width (g) is F-B (T-S).
Refer to the table below for the dimensions of PC and QC when combined with Fine Thread alterations (PMC, PMS, QMC, QMS, MMC, MMS, NMC, and NMS).

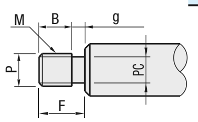
•For Coarse Threads

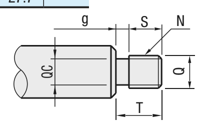
P(=M) Q(=N)	PC QC	F-B (T-S)
6	4.4	2
8	6.0	3
10	7.7	
12	9.4	4
16	13.0	
20	16.4	5
24	19.6	
30	25.0	

•When combined with Fine Thread Alterations

PMC, MMC QMC, NMC	PC QC	F-B (T-S)
6	4.8	2.0
8	6.4	
10	8.4	
12	10.4	
15	13.4	
17	15.4	
20	18.4	
25	22.7	3.0
30	27.7	

PMS, MMS QMS, NMS	PC QC	F-B (T-S)
10	8.0	3.0
12	9.7	
14	11.7	
18	15.7	





Shaft Material, Hardness, Surface Treatment

M Material	O.D. Tolerance	H Hardness	S Surface Treatment
EN 1.3505 Equiv.	g6, h5	Induction Hardening EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
EN 1.4125 Equiv.			
EN 1.3505 Equiv.			Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
EN 1.4125 Equiv.			
EN 1.3505 Equiv.	g6		LTBC Plating Plating Thickness: 1 ~ 2μ
EN 1.4125 Equiv.			
EN 1.1191 Equiv.	f8	-	Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness 10μ or More
EN 1.4301 Equiv.			

Effective Hardened Layer Depth of Shafts (hardened) with O.D. Tolerance g6, h5

Unit: mm

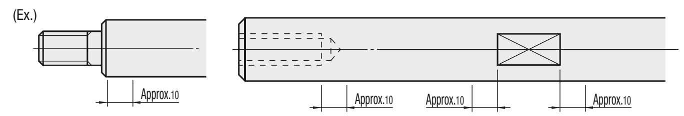
O.D. (D)	Effective Hardened Depth	
	EN 1.3505 Equiv.	EN 1.4125 Equiv.
3	0.5 or More	0.5 or More
4		
5		
6~10		
12, 13	0.7 or More	0.5 or More
15~20		0.7 or More
25~50	1.0 or More	

Notes on Hardening and Surface Treating

Reduced Hardness around Machined Areas

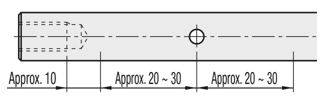
Machining is applied after base materials are case hardened.
In the example below, annealing caused by machining may result in reduced hardness of the machined area + 10mm fore and aft.

(Ex.)



Annealing caused by machining may lower hardness of following areas:
- All threaded shafts
- All stepped shafts
- Tapped Holes: when M≥D/2, RC threads, two tapped holes on ends, hard chrome plated EN 1.4125 Equiv. products
- Retaining ring grooves, keyway, tapers, hex socket holes, wrench flats, tapped pilot, set screw grooves
- Keyway, Flats, 90-deg. Flats, V-grooves
- Shaft Ends Configurable Type (G, H shape), Hollow Shafts (Lateral Hole on One Side)

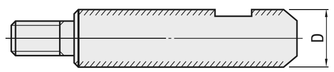
(Note) Excluding "Full Length Hardness Guaranteed Type"



•For Shafts with Cross-Drilled Hole, annealing may lower hardness in the range of 20mm and 30mm around machined area for EN 1.3505 Equiv. and EN 1.4125 Equiv. respectively.

Surface Treatment Plating Layers

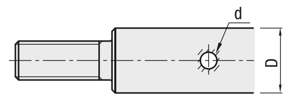
Machining is applied after base materials are surface treated.
In the example below, only ▨ D area is treated with hard chrome plating/low temp. black chrome plating.
Hard chrome plating, low temp. black chrome plating will not remain on cut-ends, stepped. tapered, and altered sections.
For Features of LTBC Plating, see **P.128**.
Hollow shaft interior surfaces are not plated, which causes rust.



Other plating finished shapes are:
- Threaded, Stepped and Tapped
- Retaining ring grooves, keyway, tapers, hex socket holes, wrench flats, set screw grooves
- Keyway, Flats, 90-deg. Flats, V-grooves

Surface Treatment Fully Plated Shafts will have the plating on the entire shaft except centering holes and tapped sections.

Cross-Drilled Hole Dimension Details

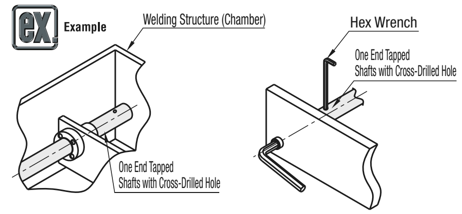


Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
Hard chrome plating layers around machined area may be flaked by deburring. (▨ Areas)
Orientation in relation to other features will be random.

D	d
8	3
10	
12	
13	4
15	
16	

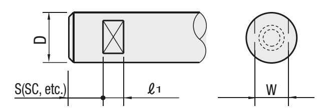
D	d
18	6
20	
25	7
30	

Example



•Shafts with Cross-Drilled Hole are suitable for narrow work space.

Shafts: Detailed Wrench Flats Dimensions



S(SC, etc.) =1mm Increment
S (SC, etc.) +ℓ1≤L
S(SC etc.) =0 or S(SC etc.) ≥1
Cannot be machined coplanar.
Orientation in relation to other features will be random.

D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
15	13	
16	14	

D	W	ℓ1
18	16	10
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

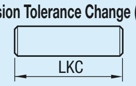
Not applicable to D=3, 4, 5

Shaft Alterations - Overview

■Shaft Alterations - Overview

Tolerance Change

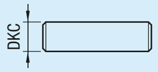
L Dimension Tolerance Change (Precision) — Code: **LKC**



Changes "L Tolerance" to a higher precision level.
Ordering Code LKC
L dimensions can be specified in 0.1mm increments for LKC.
Application Notes See each product page for details.

- L<200 ···→L±0.03
- 200≤L<500 ···→L±0.05
- L≥500 ···→L±0.1

Revise O.D. Tolerance to h5 — Code: **DKC**

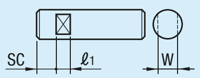


O.D. tolerance is altered to h5.
Ordering Code DKC
Application Notes Available only for Hollow Shafts

D	h5 Tolerance
6	0 / -0.005
8, 10	0 / -0.006
12~16	0 / -0.008
20~30	0 / -0.009
35~50	0 / -0.011

Wrench Flats

Wrench Flats at One Location — Code: **SC**



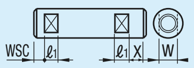
Adds Wrench Flats at one location.
Ordering Code SC5
- SC=1mm Increment
- SC+ℓ1≤L
- SC≥0

Application Notes Applicable to D=6 or more
⊗Not available in combination with WSC.

D	W	ℓ1	D	W	ℓ1
6 (7)	5	8	20(22)	17	10
8 (9)	7		(24)25(26)	22	
10	8		(28)30(31, 32)	27	15
12	10	10	35	30	
13	11		(38)40(45)	36	20
(14)15	13		50	41	
16(17)	14				
18(19)	16				

D dimensions in ( ) are only applied to Shaft End Configurable Type on **P.225**.

Wrench Flats at Two Locations — Code: **WSC**



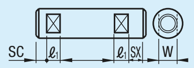
Adds Wrench Flats at two locations.
Ordering Code WSC12-X8
- WSC, X=1mm Increment
- WSC+X+ℓ1x2<L
- WSC(X)≥0

Application Notes Applicable to D=6 or more
⊗Orientation between wrench flats is not coplanar.
Not available in combination with SC or SX.

D	W	ℓ1	D	W	ℓ1
6(7)	5	8	20(22)	17	10
8(9)	7		(24)25(26)	22	
10	8		(28)30(31, 32)	27	15
12	10	10	35	30	
13	11		(38)40(45)	36	20
(14)15	13		50	41	
16(17)	14				
18(19)	16				

D dimensions in ( ) are only applied to Shaft End Configurable Type on **P.225**.

Second Set of Wrench Flats — Code: **SX**



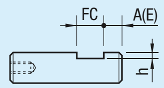
Adds a second set of Wrench Flats.
Ordering Code SX15
- SX=1mm Increment
- SC+SX+ℓ1x2<L
- SX≥0

Application Notes Applicable to D=6 or more, only to With Wrench Flats Type.
⊗Orientation between wrench flats is not coplanar. Not available in combination with WSC.

D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8		25	22	
12	10	10	30	27	15
13	11		35	30	
15	13		40	36	20
16	14		50	41	

Set Screw Flat

Set Screw Flat at One Location — Code: **FC**



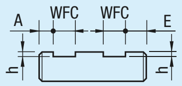
Specifying FC starting datum points vary depending on products. See each product page for details.

Adds Set Screw Flat at one location.
Ordering Code FC10-A8,FC10-E8
- FC, A(E) =1mm Increment
- FC≤3xD
- When 1.5xD<FC, FC≤L/2
- A(E)=0 or A(E)≥2

⊗Not available in combination with WFC.

D	h
3~ 5	0.5
6~18	1
20~40	2
50	3

Set Screw Flats at Two Locations — Code: **WFC**

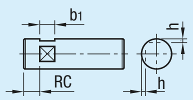


Adds Set Screw Flats at two locations.
Ordering Code WFC10-A8-E20
- WFC, A, E=1mm Increment
- WFC≤3xD
- When 1.5xD<WFC, 2WFC≤L/2
- A(E)=0 or A(E)≥2

⊗Orientation between set screw flats is not coplanar. Not available in combination with FC.

D	h
3~ 5	0.5
6~18	1
20~40	2
50	3

90-deg. Set Screw Flat at One Location — Code: **RC**

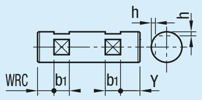


Adds 90-deg. Set Screw Flat at one location.
Ordering Code RC10
- RC=1mm Increment
- RC+b1≤L
- RC≥2

Application Notes Only applicable to D=10 ~ 30.
⊗Not available in combination with WRC; not applicable to Precision Type.

D	b1	h
10	6	0.5
12~20	6	1.0
25	10	1.0
30	12	1.0

90-deg. Set Screw Flats at Two Locations — Code: **WRC**



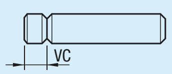
Adds 90-deg. Set Screw Flats at two locations.
Ordering Code WRC10-Y10
- WRC=1mm Increment
- WRC+b1≤L
- WRC(Y)≥2

Application Notes Only applicable to D=10 ~ 30.
⊗Orientation between set screw flats is not coplanar. Not available in combination with RC. Not applicable to Precision Type.

D	b1	h
10	6	0.5
12~20	6	1.0
25	10	1.0
30	12	1.0

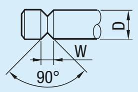
V Groove

V Groove at One Location — Code: **VC**



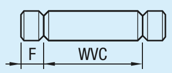
Adds V Groove at one location.
- VC=1mm Increment
- VC>W

Application Notes Applicable to D=6 or more
⊗Different from VC Hollow Shafts.



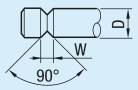
D	W
6, 8	2
10~18	4
20~25	6
30~35	8
40~50	12

V Grooves at Two Locations — Code: **WVC**



V Grooves at Two Locations
Ordering Code WVC180-F8
- WVC, F=1mm Increment
- F>W

Application Notes Applicable to D=6 or more
⊗Different from WVC Hollow Shafts.



D	W
6, 8	2
10~18	4
20~25	6
30~35	8
40~50	12

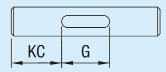
■Shaft Alterations - Overview

Keyway

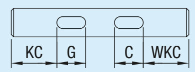
Keyway — Code: **KC / WKC**

A wide variety of Shafts with keyway alterations are available on the Rotary Shaft pages. **P.819~880**

Keyway at One Location: KC



Keyways at Two Locations: WKC

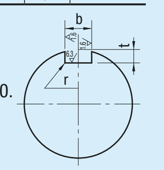


For specifying KC locations, starting datum points vary depending on products. See details on related pages.

KC: Adds Keyway at one location.
Ordering Code KC10-G10
WKC: Adds Keyways at two locations.
Ordering Code WKC10-C8-KC10-G10
- KC, WKC, G, C=1mm Increment
- 4≤G(C)≤30
- G(C)≤L/3
- 2≤KC(WKC)≤L/3,KC(WKC)=0
- G+C≤L/3
- Mx2<KC+F
- For One End / Both Ends Stepped and Tapped Type, Mx2<KC+F. Application Notes Only applicable to D=12, 16, 20, 25 and 30.

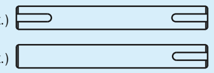
⊗For WKC, keyways cannot be machined coplanar.
Not applicable to precision shafts.

Shaft Dia.	b Standard Dimension	b Tolerance (N9)	t Standard Dimension	t Tolerance	r
12	4	0 / -0.03	2.5	+0.1 / 0	0.08~0.16
16	5		3.0		0.16~0.25
20	6		3.5		
25	8	0 / -0.036	4.0	+0.2 / 0	
30					



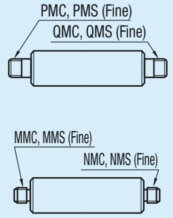
When KC and WKC=0, keyway is configured as the drawing on right. Ex.)

When KC+G≥L, keyway is configured as the drawing on right. Ex.)



Thread Alterations

Change to Fine Thread — Code: **PMC / PMS / QMC / QMS / MMC / MMS / NMC / NMS**

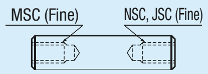


Changes the threads to fine threads shown in the table below.
(PMC, QMC, MMC, NMC→Applicable to bearing nut fine thread pitches.)
(PMS, QMS, MMS, NMS→Applicable to cylinder fine thread pitches.)
Ordering Code PMC15 Ex.) When requesting M15 with D20 and 1.0 bearing nut fine thread pitch

D	PMC, QMC, MMC, NMC												PMS, QMS, MMS, NMS			
*3	3															
*4	3	4														
5	3	*4	*5													
6(7)	3	4	*5	*6												
8(9)	3	4	5	6	*8											
10		4	5	6	8	*10							*10			
12			5	6	8	10	*12						10	*12		
13			5	6	8	10	*12						10			
15			5	6	8	10	12	*15					10	12		
(14)16(17)			5	6	8	10	12	*15					10	12	14	
18(19)			5	6	8	10	12	15	*17				10	12	14	*18
20(22)				6	8	10	12	15	17	*20			10	12	14	18
(24)25(26)					8	10	12	15	17	20	*25		10	12	14	18
(28)30(31, 32)					8	10	12	15	17	20	25	*30	10	12	14	18
*35						10	12	15	17	20	25	30	10	12	14	18
(38)*40(45)							12	15	17	20	25	30		12	14	18
*50								15	17	20	25	30			14	18
Pitch	0.35	0.5		0.75	1.0						1.5		1.25	1.5		

D dimensions in ( ) are only applied to Shaft Ends Configurable Type on **P.225**. * marked sizes are not applicable to Precision Type.

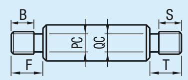
Change to Fine Tapped Thread — Code: **MSC / NSC / JSC**



Changes tapped threads to fine tapped threads shown in the table below.
Ordering Code MSC14
Ex.) When requesting M14 with D20 and 1.5 fine thread pitch
Application Notes Applicable to D=12 or more
⊗Not applicable to D=35 and more for precision shafts.

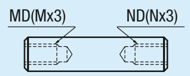
D	MSC, NSC, JSC				
12, 13	8				
15, 16	8	10			
18	8	10	12		
20	8	10	12	14	
25~35	8	10	12	14	18
40		10	12	14	18
50			12	14	18
Pitch	1.0	1.25	1.5		

Undercut — Code: **PC / QC**



PC: Adds undercut(s) on P dimension area.
QC: Adds undercut(s) on Q dimension area.
Ordering Code PC
For detailed undercut dimensions, see **P.111**.
Application Notes Applicable to M=6 or more.
⊗Not applicable to D=Q and D=P.

Change the effective tap depth to x3 — Code: **MD / ND**



Change the effective tap depth to M(N)x3.
Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND)
Application Notes Only applicable to D=6~30, M(N)=6~20
- One End Tapped: MDx2.5+4≥L
- Both Ends Tapped: MDx2.5+4+NDx2.5+4≥L

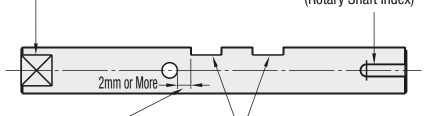
■Cautions for Alteration Selections

- Alterations may lower hardness. See **P.112**
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. (See below)

Ex. 1

Wrench Flats (SC)
When the flats are to start from the ends, specify as "SC0".

Keyway (KC)
See Rotary Shaft pages for more variations.
P.819 ~ P.880
(Rotary Shaft Index)



When Selecting Multiple Alterations
The distance between machined areas should be greater than 2mm.

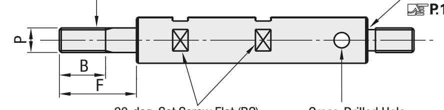
Set Screw Flat
Orientation between two set screw flats is not coplanar.
- WFC (Set Screw Flats at Two Locations)
- WSC (Wrench Flats at Two Locations)
- WRC (90-deg. Set Screw Flats at Two Locations)
- WKC (Keyways at Two Locations)

Ex. 2

Threads
Correlation between F and B:
When P≤6, B≤F-2;
when P=8 or 10, B≤F-3;
when P≤6, B≤F-5

F Length:
5≤F≤Px5
B Length:
B≥Pitchx3

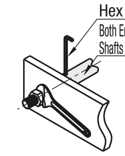
Undercut (PC, QC)
For the following types, PC and QC alterations are no longer available. Please see pages below.
One End Threaded with Undercut
P.145, 147, 167, 169
Both Ends Threaded with Undercuts
P.157, 159



90-deg. Set Screw Flat (RC)
Orientation between two set screw flats is not coplanar.
Recommended to be used with Shaft Collar **P.267**.

Cross-Drilled Hole

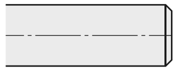
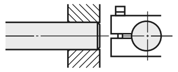
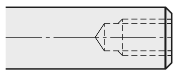
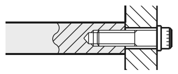
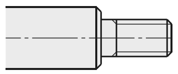
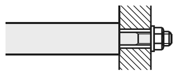
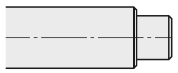
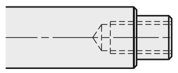
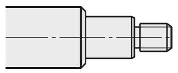
Hex Wrench
Both Ends Threaded Shafts with Cross-Drilled Hole



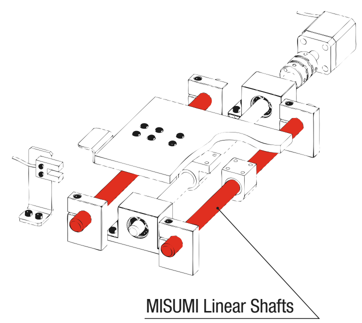
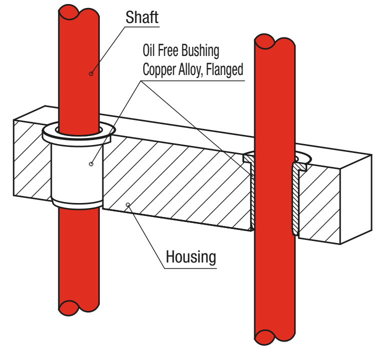
• Shafts with Cross-Drilled Hole are suitable for narrow work space.

Guide to Shaft Products / Features by Shapes

List of Features by Shapes

Shape	Figures	Mounting Examples	Features
Solid			· Simple Shape · Used in combination with Shaft Supports
Tapped			· Can be easily mounted only with screw through holes. · Mounting position accuracy is low. · Horizontal mountings are for light load applications.
Threaded			· High accuracy assembly is possible with threaded shaft and mating bore fits. · Stable when used for heavy loads, horizontally, and in long lengths.
Stepped Solid			· High accuracy assembly is possible with stepped shaft section and mating bore fits. · Stable when used for heavy loads, horizontally, and in long lengths. · The step enables axial direction constraining. · Shaft diameters can be freely set to match the mating bores.
Stepped and Tapped			
Stepped and Threaded			

Selective Shaft Use

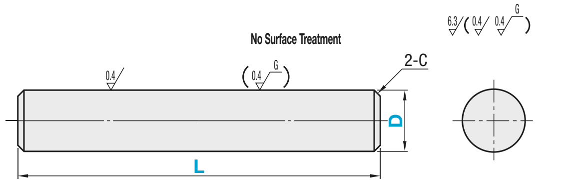
		High Precision g6/g6 Precision Grade /h5		For Oil Free Bushing f8
App. Example				
Recommended Apps.		· For high accuracy applications (Outer diameter, Straightness and Circularity) · for high load/high durability purposes - For horizontal use and heavy load applications - Extensive sliding distance, frequency and speed.		· For use with oil-free bushings · Sufficient clearance for surface contact sliding can be obtained.
Standards	**Material**	EN 1.3505 Equiv.	EN 1.4125 Equiv.	EN 1.1191 Equiv.
	Hardness	58HRC~	56HRC~	No hardening
	Surface treatment	None/ Hard Chrome Plating Plating hardness HV750~ Plating thickness 5μ or more		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness 10μ or More
	O.D.	Ø3~50		Ø6~50
	Length	L10~1500		L20~1500
Accuracy	**Circularity**	Ø3~13 0.004 Ø15~20 0.005 Ø20~30 0.006 Ø40~50 0.007		Ø6~10 0.011 Ø12~18 0.014 Ø20~30 0.017 Ø40~50 0.020
	Straightness	Ø3, 4 N/A (L/100)x0.05 or Less Ø5 N/A (L/100)x0.03 or Less Ø6~50 100 or Less 0.01 or Less Ø6~50 Over 100 (L/100)x0.01 or Less		L≤100 0.025 or Less L>100 (L/100)x0.025 or Less
Related Products		■Linear Bushings (P.297~)  ■Shaft Support (P.229~) 		■Oil Free Bushings (P.369~)  ■Shaft Collar (P.263~) 

Shafts
Solid Type

■Can be selected in 1mm increments. Stocked in fixed L dimensions.

Features of LTBC Plating P.128
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Type			M Material	H Hardness		S Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8				
SFJ	SFU	-	EN 1.3505 Equiv.	Induction Hardened Effective Hardened Depth P.112 EN 1.3505 Equiv. EN 1.4125 Equiv.	58HRC~ 56HRC~	-
ZSFJ	-	-				
SSFJ	SSFU	-	EN 1.4125 Equiv.			
PSFJ	PSFU	-	EN 1.3505 Equiv.			Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 5μ or More
PSSFJ	PSSFU	-	EN 1.4125 Equiv.			
RSFJ	-	-	EN 1.3505 Equiv.			LTBC Plating
-	-	PSFG	EN 1.1191 Equiv.	-		Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 10μ or More
-	-	PSSFG	EN 1.4301 Equiv.			



D Tol.			
D	g6	h5	f8
3	-0.002 -0.008	0 -0.004	-
4			
5	-0.004 -0.012	0 -0.005	
6			-0.010 -0.028
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

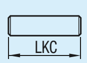
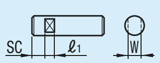
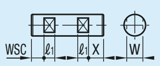
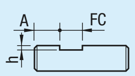
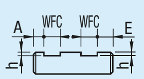
Part Number Type	D	L 1mm Increment	C
(D Tolerance g6) SFJ, SSFJ, PSFJ, PSSFJ, RSFJ (D≤30, L≤500) (D Tolerance h5) SFU, SSFU, PSFU, PSSFU (D Tolerance f8) PSFG, PSSFG	3	10~ 400	0.2 or Less
	4	10~ 400	
	5	10~ 400	
	6	20~ 600	0.5 or Less
	8	20~ 800	
	10	20~ 800	
	12	20~1000	
	13	25~1000	
	15	25~1000	
	16	30~1200	
	18	30~1200	
	20	30~1200	1.0 or Less
	25	35~1200	
	30	35~1500	
	35	35~1500	
	40	50~1500	
	50	65~1500	

Part Number Type	D	L Fixed	C	Unit Price
ZSFJ	10	100	0.5 or Less	
	12	100		
	12	300		
	20	200	1.0 or Less	
	20	300		

Ordering Example: Part Number - L
SFJ20 - 75

Alterations: Part Number - L - (LKC, SC···etc.)
SFJ30 - 250 - LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	L Dimension Tolerance Change (Precision) Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 ···→L±0.03 200≤L<500 ···→L±0.05 L≥500 ···→L±0.1
	SC	Wrench Flats at One Location Ordering Code SC5 Application Notes Applicable to D=6 or more SC=1mm Increment SC+ℓ1≤L SC≥0 Not available in combination with WSC.
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 Application Notes Applicable to D=6 or more WSC, X=1mm Increment WSC+X+ℓ1×2<L WSC(X)≥0 Orientation between wrench flats is not coplanar. Not available in combination with SC.
	FC	Set Screw Flat at One Location Ordering Code FC10-A8 FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 A=0 or A≥2 Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC10-A8-E20 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Two set screw flats cannot be machined coplanar. Not available in combination with FC.

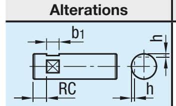
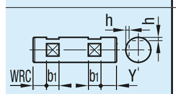
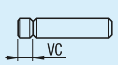
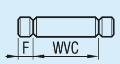
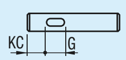
D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

FC:

D	h
3~ 5	0.5
6~18	1
20~40	2
50	3

WFC:

D	h
3~ 5	0.5
6~18	1
20~40	2
50	3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	VC	V Groove at One Location Ordering Code VC8 Application Notes Applicable to D=6 or more Not available in combination with WVC.
	WVC	V Grooves at Two Locations Ordering Code WVC180-F8 Application Notes Applicable to D=6 or more Not available in combination with VC.
	KC	Add keyway at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.

For details, see Shaft Alteration Guide. P.113

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
Alterations may lower hardness. See P.112

Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1500
SFJ SFU	3									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6												-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								
SSFJ SSFU	3									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6												-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	50	-																								
PSFJ PSFU	3									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6												-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
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	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								
PSSFJ PSSFU	3									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6												-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								

For D tolerance h5, JPY390 is added to the prices above.

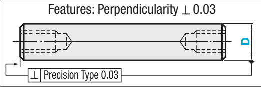
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFJ	3, 4, 5							-
	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSFG	6					-			
	8						-		
	10							-	
	12								
	13								-
	15, 16								
	18, 20								
	25								
	30								
	35								
	40								
	50								

Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSSFG	6					-			
	8						-		
	10							-	
	12								
	13								-
	15, 16								
	18, 20								
	25								
	30								
	35								
	40								
	50								

Shafts
Both Ends Tapped

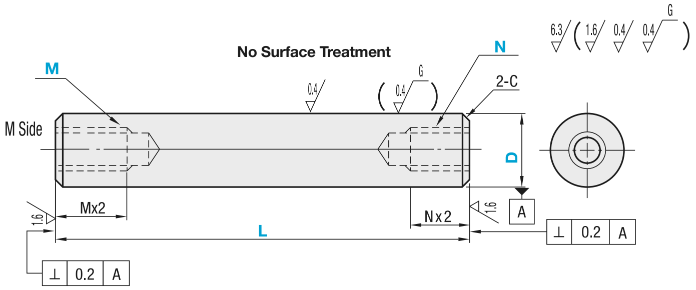
High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥ 0.03



P.191

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.191.
■For Shafts with Wrench Flats and Cross-Drilled Hole, see P.121.

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFJW	SFUW	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFJW	SSFUW	-	EN 1.4125 Equiv.		
PSFJW	PSFUW	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFJW	PSSFUW	-	EN 1.4125 Equiv.		
RSFJW	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGW	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGW	EN 1.4301 Equiv.		



D Tol.			
D	g6	h5	f8
4	-0.004 -0.012	0 -0.005	-
5			
6			-0.010 -0.028
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
Full Length Hardness Guaranteed Shafts P.127
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

Part Number – Type

(D Tolerance g6): SFJW, SSFJW, PSFJW, PSSFJW, RSFJW (D≤30, L≤500)
(D Tolerance h5): SFUW, SSFUW, PSFUW, PSSFUW
(D Tolerance f8): PSFGW, PSSFGW

D	L specified in 1mm Increment	M (Coarse), N (Coarse) Selection	C
4	20~ 300	2	0.2 or Less
5	20~ 400	2.6 3	
6	20~ 600	3	0.5 or Less
8	20~ 800	3 4 5	
10	20~ 800	3 4 5 6	
12	20~1000	4 5 6 8	
13	25~1000	4 5 6 8	
15	25~1000	4 5 6 8 10	
16	30~1200	4 5 6 8 10	
18	30~1200	4 5 6 8 10 12	
20	30~1200	4 5 6 8 10 12	1.0 or Less
25	35~1200	4 5 6 8 10 12 16	
30	35~1500	6 8 10 12 16 20	
35	35~1500	8 10 12 16 20 24	
40	50~1500	10 12 16 20 24 30	
50	65~1500	12 16 20 24 30	

L requires Mx2+Nx2≤L. When Mx2.5+4+Nx2.5+4≥L, tap pilot holes may go through.

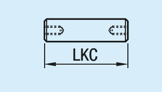
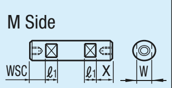
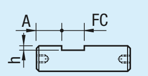
Ordering Example

Part Number	-	L	-	M	-	N
SFJW8	-	200	-	M4	-	N4
SSFJW20	-	500	-	M6	-	N10

Alterations

Part Number	-	L	-	M (MSC, MD)	-	N (NSC, MD)	-	(LKC…etc.)
SFJW30	-	500	-	M8	-	N10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 ···→L±0.03 200≤L<500 ···→L±0.05 L≥500 ···→L±0.1
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 Application Notes Applicable to D=6 or more WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between two set screw flats is not coplanar. Not available in combination with FC.
	FC	Set Screw Flat at One Location Ordering Code FC10-A8 FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or A≥2 Not available in combination with WFC.

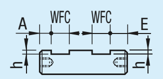
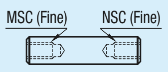
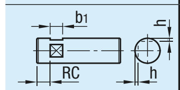
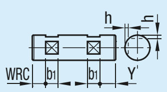
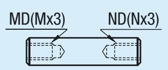
WSC:

D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8		25	22	
12	10	10	30	27	15
13	11		35	30	
15	13		40	36	20
16	14		50	41	

FC:

D	h
4~ 5	0.5
6~18	1
20~40	2
50	3

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
Alterations may lower hardness. See P.112

Alterations	Code	Spec.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E2 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.
	MSC NSC	Change to Fine Tapped Thread Ordering Code MSC14 (M is changed to MSC) NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=6~30, M(N)=6~20 One End Tapped: MDx3.5+4≥L Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L

WFC:

D	h
4~ 5	0.5
6~18	1
20~40	2
50	3

For details, see Shaft Alteration Overview. P.113

Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1500
SFJW SFUW	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								
SSFJW SSFUW	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
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	50	-																								
PSFJW PSFUW	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	50	-																								
PSSFJW PSSFUW	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
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	10																	-	-	-	-	-	-	-	-	-
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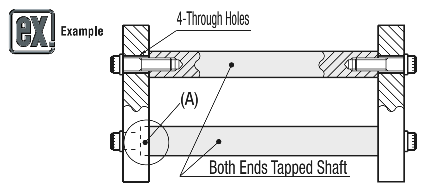
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								

Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFJW	4						-	-
	5							-
	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							



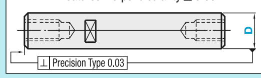
Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSFGW	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSSFGW	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

Both Ends Tapped with Wrench Flats / Both Ends Tapped with Cross-Drilled Hole

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥ 0.03



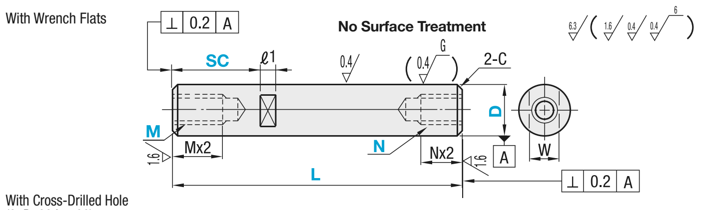
P.191

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.191.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.119.

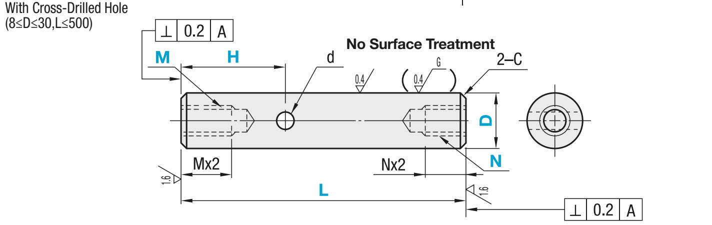
Type					Material	Hardness	Surface Treatment
With Wrench Flats			With Cross-Drilled Hole				
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
SFJZ	SFUZ	-	SFHZ	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFJZ	SSFUZ	-	SSFHZ	-	EN 1.4125 Equiv.		
PSFJZ	PSFUZ	-	PSFHZ	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFJZ	PSSFUZ	-	PSSFHZ	-	EN 1.4125 Equiv.		
RSFJZ	-	-	RSFHZ	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGZ	-	PSGHZ	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGZ	-	-	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

With Wrench Flats



With Cross-Drilled Hole
(8≤D≤30,L≤500)



- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

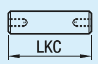
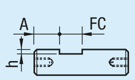
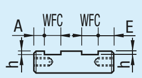
Part Number Type	D	L specified in 1mm Increment	M (Coarse), N (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	C
(With Wrench Flats) (D Tolerance g6) SFJZ SSFJZ PSFJZ PSSFJZ RSFJZ (D≤30,L≤500) (D Tolerance f8) PSFGZ PSSFGZ; (D Tolerance h5) SFUZ SSFUZ PSFUZ PSSFUZ; (With Cross-Drilled Hole) 8≤D≤30, L≤500 (D Tolerance g6) SFHZ SSFHZ PSFHZ PSSFHZ RSFHZ (D Tolerance f8) PSGHZ	6	20~600	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	-	-	0.5 or Less
	8	20~800	3 4 5		7		H=1mm Increment L≥H+d/2+Nx2.5+6 H≥Mx2.5+d/2+6	3	
	10	20~800	3 4 5 6		8				
	12	20~1000	4 5 6 8		10	10		4	
	13	25~1000	4 5 6 8		11				
	15	25~1000	4 5 6 8 10		13				
	16	30~1200	4 5 6 8 10		14				
	18	30~1200	4 5 6 8 10 12		16			6	
	20	30~1200	4 5 6 8 10 12		17				1.0 or Less
	25	35~1200	4 5 6 8 10 12 16		22			7	
	30	35~1500	6 8 10 12 16 20		27	15			
	35	35~1500	8 10 12 16 20 24		30		-	-	
	40	50~1500	10 12 16 20 24 30		36	20			
	50	65~1500	12 16 20 24 30		41				

L requires Mx2+Nx2≤L. When Mx2.5+4+Nx2.5+4≥L, tap pilot holes may go through.

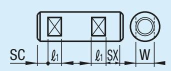
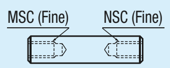
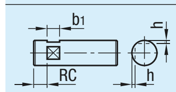
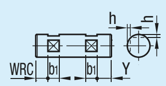
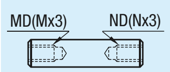
Ordering Example	Part Number	-	L	-	M	-	N	-	SC	-	H
	SFJZ10	-	200	-	M5	-	N5	-	SC10		
	SSFHZ20	-	500	-	M6	-	N10			-	H20

Alterations	Part Number	-	L	-	M (MSC, MD)	-	N (NSC, ND)	-	SC	-	H	-	(LKC···etc.)
	SFJZ30	-	500	-	M8	-	N10	-	SC10			-	LKC

Alteration Details P.113

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 ···›L±0.03 200≤L<500 ···›L±0.05 L≥500 ···›L±0.1
 A FC h	FC	Set Screw Flat at One Location Ordering Code FC10-A8 FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 A=0 or A≥2 Not available in combination with WFC. D / h: 6~18 / 1; 20~40 / 2; 50 / 3
 A WFC WFC E h h	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E2 WFC,A,E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Two set screw flats cannot be machined coplanar. Not available in combination with FC. D / h: 6~18 / 1; 20~40 / 2; 50 / 3

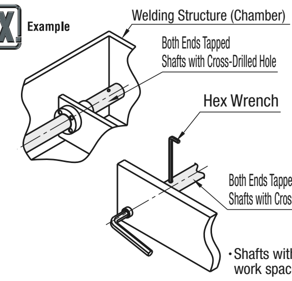
- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
- The distance between wrench flats and cross-drilled holes should be greater than 2mm for alterations.
- Alterations may lower hardness. See P.112

Alterations	Code	Spec.
 SC ℓ1 ℓ1 SX W	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D / W / ℓ1: 6 / 5 / 8; 8 / 7 / 8; 10 / 8 / 8; 12 / 10 / 10; 13 / 11 / 10; 15 / 13 / 10; 16 / 14 / 10; 18 / 16 / 10; 20 / 17 / 10; 25 / 22 / 10; 30 / 27 / 15; 35 / 30 / 15; 40 / 36 / 20; 50 / 41 / 20
 MSC (Fine) NSC (Fine)	MSC NSC	Change to Fine Tapped Thread Ordering Code MSC14 (M is changed to MSC) NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
 b1 h RC h	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC. For details, see Shaft Alteration Overview. P.113
 h h WRC b1 b1 Y	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
 MD(Mx3) ND(Nx3)	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=6~30, M(N)=6~20 Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L

Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1500
SFJZ, SFUZ, SFHZ	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								
SSFJZ, SSFUZ, SSFHZ	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								
PSFJZ, PSFUZ, PSFHZ	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								
PSSFJZ, PSSFUZ, PSSFHZ	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								

Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFJZ, RSFHZ	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Example



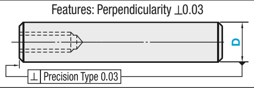
- Shafts with Cross-Drilled Hole are suitable for narrow work space.

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSFGZ, PSGHZ	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSSFGZ	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts
One End Tapped

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03

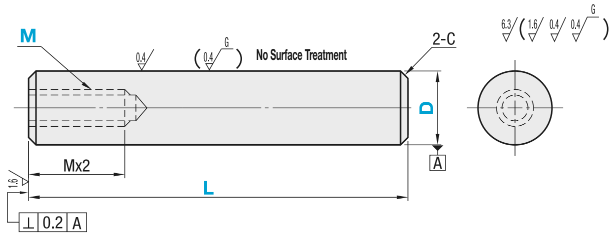


P.193

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.193.
■For Shafts with Wrench Flats and Cross-Drilled Hole, see P.125.

- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
- Full Length Hardness Guaranteed Shafts P.127
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

Type			M Material	H Hardness	S Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFJT	SFUT	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFJT	SSFUT	-	EN 1.4125 Equiv.		
PSFJT	PSFUT	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFJT	PSSFUT	-	EN 1.4125 Equiv.		
RSFJT	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGT	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGT	EN 1.4301 Equiv.		



D Tol.			
D	g6	h5	f8
4	-0.004 -0.012	0 -0.005	-
5			
6			-0.010 -0.028
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

Part Number Type	D	L specified in 1mm Increment	M (Coarse) Selection	C
	4	20~ 300	2	0.2 or Less
	5	20~ 400	2.6 3	
	6	20~ 600	3	0.5 or Less
(D Tolerance g6) SFJT SSFJT PSFJT PSSFJT RSFJT (D≤30, L≤500)	8	20~ 800	3 4 5	
(D Tolerance h5) SFUT SSFUT PSFUT PSSFUT	10	20~ 800	3 4 5 6	
	12	20~1000	4 5 6 8	
	13	25~1000	4 5 6 8	
	15	25~1000	4 5 6 8 10	
	16	30~1200	4 5 6 8 10	
	18	30~1200	4 5 6 8 10 12	
(D Tolerance f8) PSFGT (D≥6) PSSFGT (D≥6)	20	30~1200	4 5 6 8 10 12	1.0 or Less
	25	35~1200	4 5 6 8 10 12 16	
	30	35~1500	6 8 10 12 16 20	
	35	35~1500	8 10 12 16 20 24	
	40	50~1500	10 12 16 20 24 30	
	50	65~1500	12 16 20 24 30	

When Mx2.5+4≥L, tap pilot holes may go through.

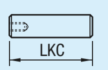
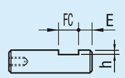
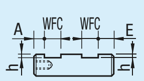
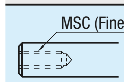
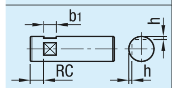
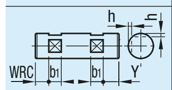
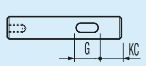
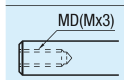
Ordering Example

Part Number	-	L	-	M
SFJT8	-	200	-	M4
RSFJT20	-	325	-	M8

Alterations

Part Number	-	L	-	M (MSC, MD)	-	(LKC···etc.)
SFJT30	-	250	-	M12	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 ···▸L±0.03 200≤L<500 ···▸L±0.05 L≥500 ···▸L±0.1
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D / h: 4~5 / 0.5; 6~18 / 1; 20~40 / 2; 50 / 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Two set screw flats cannot be machined coplanar. Not available in combination with FC. D / h: 4~5 / 0.5; 6~18 / 1; 20~40 / 2; 50 / 3
	MSC	Change to Fine Tapped Thread Ordering Code MSC14 (M is changed to MSC) Application Notes Applicable to D=12 or more
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	KC	Add keyway at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.
	MD	Change the effective length of tapped part to Mx3. Ordering Code MD6 (M is changed to MD) Application Notes Only applicable to D=6~30, M=6~20 One End Tapped: MDx3.5+4≥L

For details, see Shaft Alteration Overview. P.113

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
- Alterations may lower hardness. See P.112

Part Number Type	D	Unit Price Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1500
SFJT SFUT	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								
SSFJT SSFUT	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
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	40																									
	50	-																								
PSFJT PSFUT	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	40																									
	50	-																								
PSSFJT PSSFUT	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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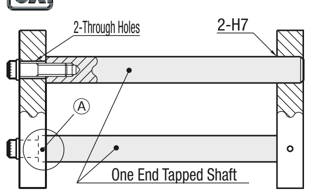
	25																							-	-	-
	30																									
	35																									
	40																									
	50	-																								

Part Number Type	D	Unit Price Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFJT	4						-	-
	5							-
	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Example



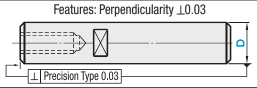
Part Number Type	D	Unit Price Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSFGT	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Unit Price Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSSFGT	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

One End Tapped with Wrench Flats / Cross-Drilled Hole

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03



P.193

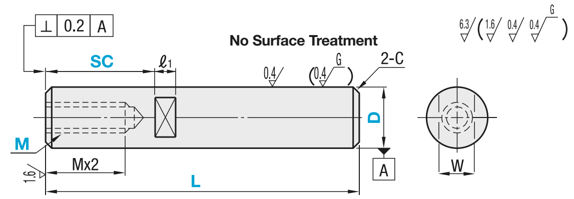
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.193.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.123.

- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

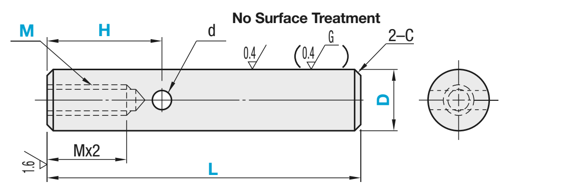
Type: With Wrench Flats D Tol. g6	With Wrench Flats D Tol. h5	With Wrench Flats D Tol. f8	With Cross-Drilled Hole D Tol. g6	With Cross-Drilled Hole D Tol. f8	M Material	H Hardness	S Surface Treatment
SFJC	SFUC	-	SFHC	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFJC	SSFUC	-	SSFHC	-	EN 1.4125 Equiv.		
PSFJC	PSFUC	-	PSFHC	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFJC	PSSFUC	-	PSSFHC	-	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	
RSFJC	-	-	RSFHC	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGC	-	PSGHC	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGC	-	-	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

With Wrench Flats



With Cross-Drilled Hole
(8≤D≤30,L≤500)



Part Number Type	D	L specified in 1mm Increment	M (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	C
(With Wrench Flats) (D Tolerance g6) SFJC, SSFJC, PSFJC, PSSFJC, RSFJC (D≤30,L≤500); (D Tolerance h5) SFUC, SSFUC, PSFUC, PSSFUC; (D Tolerance f8) PSFGC, PSSFGC. (With Cross-Drilled Hole) 8≤D≤30,L≤500 (D Tolerance g6) SFHC, SSFHC, PSFHC, PSSFHC, RSFHC; (D Tolerance f8) PSGHC	6	20~600	3	SC=1mm Increment; SC+ℓ1≤L; SC≥0; Details of Wrench Flats P.112	5	8	-	-	0.5 or Less
	8	20~800	3 4 5		7		H=1mm Increment; L≥H+d/2+2; H≥Mx2.5+d/2+6	3	
	10	20~800	3 4 5 6		8				
	12	20~1000	4 5 6 8		10	10			
	13	25~1000	4 5 6 8		11			4	
	15	25~1000	4 5 6 8 10		13				
	16	30~1200	4 5 6 8 10		14				
	18	30~1200	4 5 6 8 10 12		16			6	
	20	30~1200	4 5 6 8 10 12		17				
	25	35~1200	4 5 6 8 10 12 16		22	15		7	1.0 or Less
	30	35~1500	6 8 10 12 16 20		27				
	35	35~1500	8 10 12 16 20 24		30		-	-	
	40	50~1500	10 12 16 20 24 30		36	20			
	50	65~1500	12 16 20 24 30		41				

When Mx2.5+4≥L, tap pilot holes may go through.

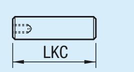
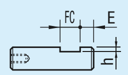
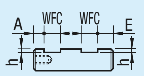
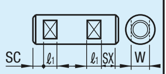
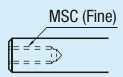
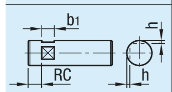
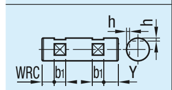
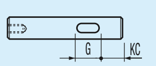
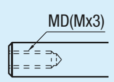
Ordering Example

Part Number	-	L	-	M	-	SC	-	H
SFJC10	-	200	-	M5	-	SC6		
SFHC20	-	425	-	M8			-	H20

Alterations

Part Number	-	L	-	M (MSC, MD)	-	SC	-	H	-	(LKC···etc.)
SFJC30	-	250	-	M12	-	SC10			-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D 6~18: h 1; D 20~40: h 2; D 50: h 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E2 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D 6~18: h 1; D 20~40: h 2; D 50: h 3
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D/W/ℓ1: 6/5/8, 8/7/8, 10/8/8, 12/10/10, 13/11/10, 15/13/10, 16/14/10, 18/16/10, 20/17/10, 25/22/15, 30/27/15, 35/30/15, 40/36/20, 50/41/20
	MSC	Change to Fine Tapped Thread Ordering Code MSC14 (M is changed to MSC) Application Notes Applicable to D=12 or more
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC. For details, see Shaft Alteration Overview. P.113
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	KC	Add keyway at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.
	MD	Change the effective length of tapped part to Mx3. Ordering Code MD6 (M is changed to MD) Application Notes Only applicable to D=6~30, M=6~20 One End Tapped: MDx3.5+4≥L

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
- The distance between wrench flats and cross-drilled holes should be greater than 2mm for alterations.
- Alterations may lower hardness. See P.112.

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1500
SFJC, SFUC, SFHC	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
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	40																									
	50	-																								
SSFJC, SSFUC, SSFHC	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
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	40																									
	50	-																								
PSFJC, PSFUC, PSFHC	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
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	30																									
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	40																									
	50	-																								
PSSFJC, PSSFUC, PSSFHC	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
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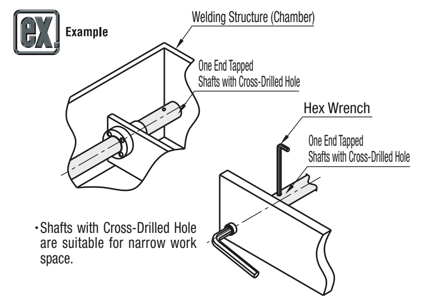
	35																									
	40																									
	50	-																								

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFJC, RSFHC	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Example



•Shafts with Cross-Drilled Hole are suitable for narrow work space.

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSFGC, PSGHC	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSSFGC	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16							-	-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Full Length Hardness Guaranteed Shafts
One End / Both Ends Tapped, Short

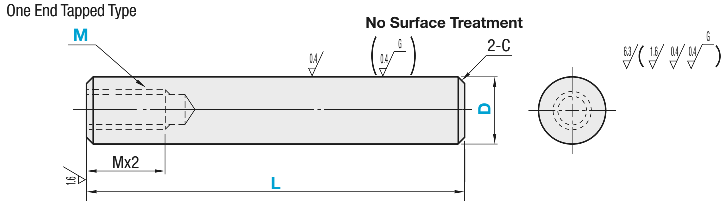
Features: Other shaft products may suffer from lowered hardness due to annealing required for tapping.
The "Full Length Hardness Guaranteed" shafts maintain the case hardness over the entire length, well suited for short stroke applications.

Features of LTBC Plating P.128
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

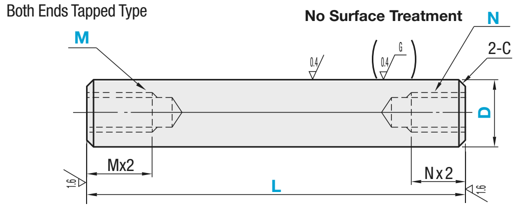
Type		D Tol.	Material	Hardness	Surface Treatment
One End Tapped	Both Ends Tapped				
SFAT	SFAW	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAT	SSFAW		EN 1.4125 Equiv.		-
RSFAT	RSFAW		EN 1.3505 Equiv.		LTBC Plating

D	D Tol.
6	-0.004 -0.012
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020

One End Tapped Type



Both Ends Tapped Type



Part Number			L	M (Coarse), N (Coarse)						C
Type		D	specified in 1mm Increment	Selection						
One End Tapped	Both Ends Tapped	6	20~150	3						0.5 or Less
SFAT	SFAW	8	20~150	3	4	5				
SSFAT	SSFAW	10	20~150	3	4	5	6			
RSFAT	RSFAW	12	20~150		4	5	6	8		
		13	25~150		4	5	6	8		
		15	25~150		4	5	6	8	10	
		16	30~150		4	5	6	8	10	
		18	30~150		4	5	6	8	10	12
		20	30~150		4	5	6	8	10	12	1.0 or Less

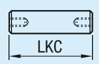
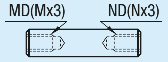
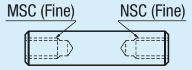
L requires Mx2+Nx2≤L.
When Mx2.5+4+Nx2.5+4≥L, tap pilot holes may go through.

Ordering Example

Part Number	-	L	-	M	-	N
SFAT20	-	80	-	M6		
SFAW15	-	100	-	M6	-	N10

Alterations

Part Number	-	L	-	M (MSC, MD)	-	N (NSC, ND)	-	(LKC)
SSFAW16	-	120	-	MSC8	-	NSC10		

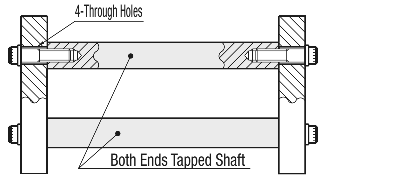
Alterations	Code	Spec.
 LKC	LKC	L Dimension Tolerance Change (Precision) Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<150 ···›L±0.03
MD(Mx3) ND(Nx3) 	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=6~30, M=6~20 One End Tapped: MDx3.5+4≥L Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L
MSC (Fine) NSC (Fine) 	MSC NSC	Change to Fine Tapped Thread Applicable to D=12 or more Ordering Code MSC14 (M is changed to MSC) NSC14 (N is changed to NSC) M(N) dimensions are equal to MSC (NSC).

D	MSC, NSC			
12, 13	8			
15, 16	8	10		
18	8	10	12	
20	8	10	12	14
Pitch	1.0	1.25	1.5	

Part Number		Unit Price					
Type	D	Min. L ~ 40	L41~60	L61~80	L81~100	L101~125	L126~150
SFAT	6						
	8						
	10						
	12						
	13						
	15, 16						
	18, 20						
SSFAT	6						
	8, 10						
	12, 13						
	15, 16						
	18, 20						
RSFAT	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
SFAW	6						
	8						
	10						
	12						
	13						
	15, 16						
	18, 20						

Part Number		Unit Price					
Type	D	Min. L ~ 40	L41~60	L61~80	L81~100	L101~125	L126~150
SSFAW	6						
	8, 10						
	12, 13						
	15, 16						
	18, 20						
RSFAW	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						

Example



As Full Length Hardness Guaranteed Shafts cause no hardness loss, they are well suited for short stroke sliding.

■Features of LTBC Plating

LTBC Plating (1μ ~ 2μ thickness) applied on shafts has highly anti-rusting effect with thin black film.
Even hairpin-shaped bending won't cause cracks. Plating won't be flaked by repeat bending.
Shaft O.D. tolerance remains g6 after low temp. black chrome plating is applied. Works well with linear bushings and suitable for places where rusting is to be avoided.
Suitable for places where light reflections are undesirable, when used in combination with LTBC plated linear bushing.

Shaft after Sliding Test

Ordering Example See each product page for details.

Alterations See each product page for details.

Sliding Test Conditions
Linear Bushings: LMUR12
Shafts: RSFJ12
50km sliding test was conducted on Linear Bushings under 412N load.

LTBC plated Shafts (Regular Products):

Material	Applicable Shaft Diameter	Applicable Shaft Length
EN 1.3505 Equiv.	Ø3~Ø30	Up to 500

High Precision Linear Shafts:

Material	Applicable Shaft Diameter	Applicable Shaft Length
EN 1.3505 Equiv. EN 1.4125 Equiv.	Ø4~Ø30	Up to 448

Full Length Hardness Guaranteed Shafts:

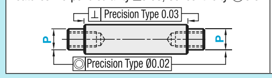
Material	Applicable Shaft Diameter	Applicable Shaft Length
EN 1.3505 Equiv.	Ø6~Ø20	Up to 150

(Note 1) Wiping LTBC plated products with solvents may result in loss of color but its anti-rust property will be unaffected. Color will settle over a month and become resistant to discoloration.
(Note 2) Tapped threads will not be coated with LTBC Plating.
(Note 3) Low temp. black chrome plated shafts may have centering holes on the ends for surface treatment.

Shafts

Both Ends Stepped and Tapped / Both Ends Stepped

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



P.195

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.195.
■For Both Ends Stepped and Tapped with Wrench Flats, see P.131.

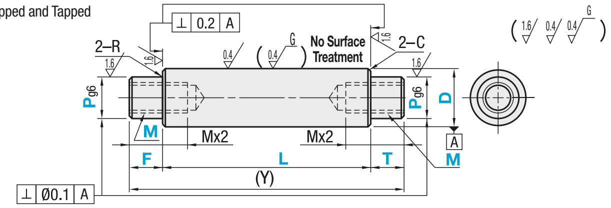
RoHS

- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

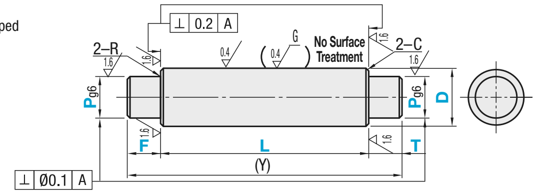
Both Ends Stepped and Tapped D Tol. g6	D Tol. h5	D Tol. f8	Both Ends Stepped D Tol. g6	D Tol. h5	D Tol. f8	M Material	H Hardness	S Surface Treatment
SFAH	SFUH	-	SFAJ	SFUJ	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFAH	SSFUH	-	SSFAJ	SSFUJ	-	EN 1.4125 Equiv.		
PSFAH	PSFUH	-	PSFAJ	PSFUJ	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAH	PSSFUH	-	PSSFAJ	PSSFUJ	-	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	
RSFAH	-	-	RSFAJ	-	-	EN 1.3505 Equiv. / EN 1.4125 Equiv.		LTBC Plating
-	-	PSFGH	-	-	PSFGJ	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGH	-	-	PSSFGJ	EN 1.4301 Equiv.		

D	g6	h5	f8
8, 10	-0.005 / -0.014	0 / -0.006	-0.013 / -0.035
12, 13, 15, 16, 18	-0.006 / -0.017	0 / -0.008	-0.016 / -0.043
20, 25, 30	-0.007 / -0.020	0 / -0.009	-0.020 / -0.053
35, 40, 50	-0.009 / -0.025	0 / -0.011	-0.025 / -0.064

Both Ends Stepped and Tapped



Both Ends Stepped



Part Number Type	D	L (1mm Increment)	F, T (1mm Increment)	P (1mm Increment)	M (Coarse) Selection	(Y) Max.	R	C
Both Ends Stepped and Tapped (D Tolerance g6) SFAH, SSFAH, PSFAH, PSSFAH, RSFAH (D≤30, L≤500); (D Tolerance h5) SFUH, SSFUH, PSFUH, PSSFUH; (D Tolerance f8) PSFGH, PSSFGH. Both Ends Stepped (D Tolerance g6) SFAJ, SSFAJ, PSFAJ, PSSFAJ, RSFAJ (D≤30, L≤500); (D Tolerance h5) SFUJ, SSFUJ, PSFUJ, PSSFUJ; (D Tol. f8) PSFGJ, PSSFGJ	8	25~796	2≤F≤Px4 2≤T≤Px4	6	3	800	0.3 or Less	0.5 or Less
	10	25~796		6~8	3 4 5	800		
	12	25~996		6~10	3 4 5 6	1000		
	13	25~996		6~11	3 4 5 6 8	1000		
	15	25~996		6~13	3 4 5 6 8 10	1000		
	16	25~1196		6~14	3 4 5 6 8 10	1200		
	18	25~1196		8~16	4 5 6 8 10 12	1200		
	20	25~1196		8~17	4 5 6 8 10 12	1200		1.0 or Less
	25	25~1196		8~22	4 5 6 8 10 12 16	1200		
	30	25~1496		9~27	5 6 8 10 12 16 20 24	1500	0.5 or Less	
	35	25~1496		9~32	5 6 8 10 12 16 20 24	1500		
	40	25~1496		11~37	6 8 10 12 16 20 24 30	1500		
	50	25~1496		11~47	6 8 10 12 16 20 24 30	1500		

• Both Ends Tapped P dimensions require M+3≤P. When (Mx2.5+4)x2≥(Y), tap pilot hole may go through.

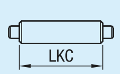
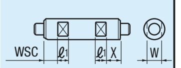
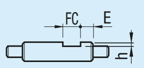
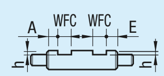
Ordering Example

Part Number	-	L	-	F	-	P	-	M	-	T
SSFAH18	-	200	-	F20	-	P15	-	M8	-	T20
SFAH20	-	400	-	F25	-	P16	-	M10	-	T20
SFAJ20	-	400	-	F25	-	P16			-	T20

Alterations

Part Number	-	L	-	F	-	P	-	M (MD, ND)	-	T	-	(LKC, WSC…etc.)
SFAH20	-	400	-	F25	-	P16	-	M10	-	T20	-	LKC

Alteration Details P.113

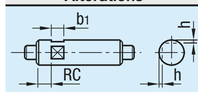
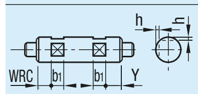
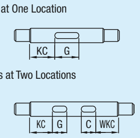
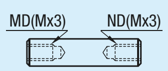
Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC ⊗Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 …L±0.03 200≤L<500 …L±0.05 L≥500 …L±0.1
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 ⊗Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 ⊗Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 ⊗Orientation between set screw flats is not coplanar. Not available in combination with FC.

WSC:

D	W	ℓ1	D	W	ℓ1
8	7	8	20	17	10
10	8		25	22	
12	10	10	30	27	15
13	11		35	30	
15	13		40	36	20
16	14		50	41	
18	16				

FC / WFC:

D	h
8~18	1
20~40	2
50	3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. ⊗Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. ⊗Not available in combination with RC. ⊗Orientation between two set screw flats is not coplanar.
•Keyway at One Location : KC •Keyways at Two Locations : WKC 	KC WKC	Keyway Ordering Code KC10-G10 WKC10-C8-KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=6~30, M(N)=6~20 Both Ends Stepped and Tapped: MDx3.5+4+NDx3.5+4≥L

For details, see Shaft Alteration Overview. P.113

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
- Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1496
SFAH, SFUH, SFAJ, SFUJ	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAH, SSFUH, SSFAJ, SSFUJ	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFAH, PSFUH, PSFAJ, PSFUJ	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFAH, PSSFUH, PSSFAJ, PSSFUJ	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

• Both Ends Stepped and Tapped • Both Ends Stepped

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAH, RSFAJ	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

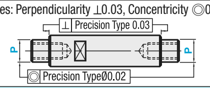
Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSFGH, PSFGJ	8, 10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSSFGH, PSSFGJ	8, 10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

Both Ends Stepped and Tapped with Wrench Flats

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



P.195

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.195.
■For Shafts W/o Wrench Flats, see P.129.

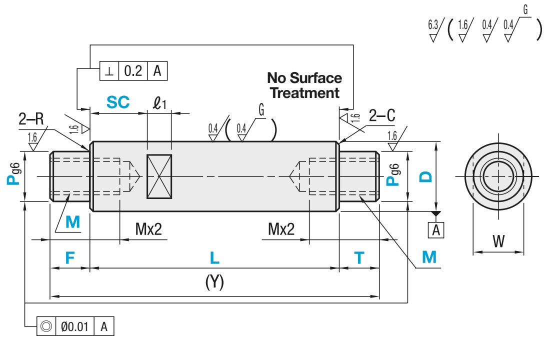
Annealing required for wrench flats machining and shaft end threading (thread effective length + approx. 10mm) may lower hardness. P.112

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

Type			M Material	H Hardness	S Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFPH	SFHU	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFPH	SSFHU	-	EN 1.4125 Equiv.		
PSFPH	PSFHU	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFPH	PSSFHU	-	EN 1.4125 Equiv.		
RSFPH	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	-	EN 1.4125 Equiv.		
-	-	PFPGH	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSFPGH	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064



Part Number		1mm Increment			M (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	R	C
Type	D	L	F, T	P		SC	W	ℓ1			
(D Tolerance g6) SFPH, SSFPH, PSFPH, PSSFPH, RSFPH (D≤30, L≤500); (D Tolerance h5) SFHU, SSFHU, PSFHU, PSSFHU; (D Tolerance f8) PFPGH, PSFPGH	8	25~796	2≤F≤Px4 2≤T≤Px4	6	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	800	0.3 or Less	0.5 or Less
	10	25~796		6~ 8	3 4 5		8		800		
	12	25~996		6~10	3 4 5 6		10	10	1000		
	13	25~996		6~11	3 4 5 6 8		11		1000		
	15	25~996		6~13	3 4 5 6 8 10		13		1000		
	16	25~1196		6~14	3 4 5 6 8 10		14		1200		
	18	25~1196		8~16	4 5 6 8 10 12		16		1200		
	20	25~1196		8~17	4 5 6 8 10 12		17		1200		1.0 or Less
	25	25~1196		8~22	4 5 6 8 10 12 16		22		1200		
	30	25~1496		9~27	5 6 8 10 12 16 20 24		27	15	1500		
	35	25~1496		9~32	5 6 8 10 12 16 20 24		30		1500	0.5 or Less	
	40	25~1496		11~37	6 8 10 12 16 20 24 30		36	20	1500		
	50	25~1496		11~47	6 8 10 12 16 20 24 30		41		1500		

P dimensions require M+3≤P. (Y) dimensions require Mx4≤(Y). Tap pilot holes may go through.

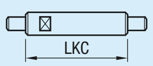
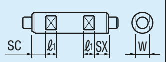
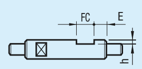
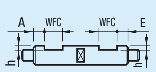
Ordering Example

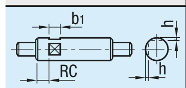
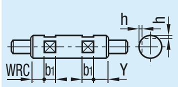
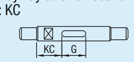
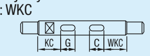
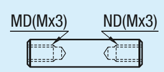
Part Number	-	L	-	F	-	P	-	M	-	T	-	SC
SFPH20	-	300	-	F25	-	P16	-	M10	-	T20	-	SC10
SFHU20	-	400	-	F25	-	P16	-	M10	-	T20	-	SC10

Alterations

Part Number	-	L	-	F	-	P	-	M (MD)	-	T	-	SC	-	(LKC···etc.)
SFPH20	-	400	-	F25	-	P16	-	M10	-	T20	-	SC10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	SX	Second Set of Wrench Flats Ordering Code SX15 SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D / W / ℓ1: 8 / 7 / 8; 10 / 8 / 8; 12 / 10 / 10; 13 / 11 / 10; 15 / 13 / 10; 16 / 14 / 10; 18 / 16 / 10; 20 / 17 / 10; 25 / 22 / 10; 30 / 27 / 15; 35 / 30 / 15; 40 / 36 / 20; 50 / 41 / 20
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D / h: 8~18 / 1; 20~40 / 2; 50 / 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC,A,E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D / h: 8~18 / 1; 20~40 / 2; 50 / 3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC. For details, see Shaft Alteration Overview. P.113
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
•Keyway at One Location : KC  •Keyways at Two Locations : WKC 	KC WKC	Keyway Ordering Code KC10-G10 WKC10-C8-KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=6~30, M(N)=6~20 Both Ends Stepped and Tapped: MDx3.5+4+NDx3.5+4≥L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1496
SFPH SFHU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFPH SSFHU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
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	40																									
	50																									
PSFPH PSFHU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFPH PSSFHU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFPH	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1496
PFPGH	8, 10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1496
PSFPGH	8, 10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

One End Stepped, Both Ends Tapped / One End Stepped, One End Tapped

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02
⊥ Precision Type 0.03
◎ Precision Type Ø0.02
P.197

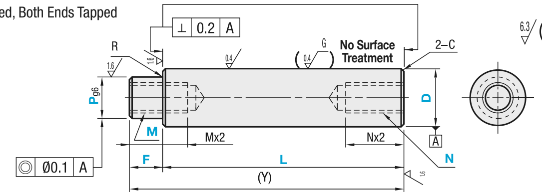
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.197.
■For One End Stepped, Both Ends Tapped with Wrench Flats, see P.135.

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

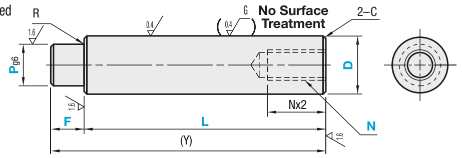
Type						Material	Hardness	Surface Treatment
One End Stepped, Both Ends Tapped			One End Stepped, One End Tapped					
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. h5	D Tol. f8			
SFAA	SFUE	-	SFNA	SFEU	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFAA	SSFUE	-	SSFNA	SSFEU	-	EN 1.4125 Equiv.		
PSFAA	PSFUE	-	PSFNA	PSFEU	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFAA	PSSFUE	-	PSSFNA	PSSFEU	-	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	
RSFAA	-	-	RSFNA	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGA	-	-	PSNGA	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More ~
-	-	PSSFGA	-	-	PSSNGA	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
8	-0.005 / -0.014	0 / -0.006	-0.013 / -0.035
10			
12	-0.006 / -0.017	0 / -0.008	-0.016 / -0.043
13			
15			
16			
18			
20	-0.007 / -0.020	0 / -0.009	-0.020 / -0.053
25			
30			
35	-0.009 / -0.025	0 / -0.011	-0.025 / -0.064
40			
50			

One End Stepped, Both Ends Tapped



One End Stepped, One End Tapped



Part Number			1mm Increment			M (Coarse) Selection	N (Coarse) Selection	(Y) Max.	R	C
Type		D	L	F	P					
One End Stepped, Both Ends Tapped	One End Stepped One End Tapped	8	25~798	2≤F≤Px4	6	3	3 4 5	800	0.3 or Less	0.5 or Less
(D Tolerance g6) SFAA SSFAA PSFAA PSSFAA RSFAA (D≤30, L≤500)	(D Tolerance g6) SFNA SSFNA PSFNA PSSFNA RSFNA (D≤30, L≤500)	10	25~798		6~8	3 4 5	3 4 5 6	800		
(D Tolerance h5) SFUE SSFUE PSFUE PSSFUE	(D Tolerance h5) SFEU SSFEU PSFEU PSSFEU	12	25~998		6~10	3 4 5 6	4 5 6 8	1000		
(D Tolerance f8) PSFGA PSSFGA	(D Tolerance f8) PSNGA PSSNGA	13	25~998		6~11	3 4 5 6 8	4 5 6 8	1000		
		15	25~998		6~13	3 4 5 6 8 10	4 5 6 8 10	1000		
		16	25~1198		6~14	3 4 5 6 8 10	4 5 6 8 10	1200		
		18	25~1198		8~16	4 5 6 8 10 12	4 5 6 8 10 12	1200		
		20	25~1198		8~17	4 5 6 8 10 12	4 5 6 8 10 12	1200		
		25	25~1198		8~22	4 5 6 8 10 12 16	4 5 6 8 10 12 16	1200		
		30	25~1498		9~27	5 6 8 10 12 16 20 24	6 8 10 12 16 20	1500	0.5 or Less	1.0 or Less
		35	25~1498		9~32	5 6 8 10 12 16 20 24	8 10 12 16 20 24	1500		
		40	25~1498		11~37	6 8 10 12 16 20 24 30	10 12 16 20 24 30	1500		
		50	25~1498		11~47	6 8 10 12 16 20 24 30	12 16 20 24 30	1500		

P dimensions require M+3≤P. When D-P≤4, stepped section chamfer C is 0.2 or less. For One End Stepped One End Tapped Type, L dimensions require Nx3≤L.
When Mx2.5+4+Nx2.5+4≥(Y), tap pilot holes may go through. When Mx2+Nx2≥(Y), effective depth of larger diameter tap has priority.

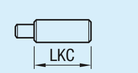
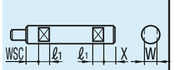
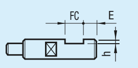
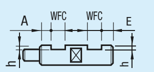
Ordering Example

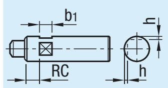
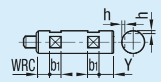
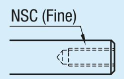
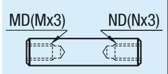
Part Number	-	L	-	F	-	P	-	M	-	N
SFAA20	-	400	-	F25	-	P16	-	M10	-	N10
SFUE20	-	400	-	F25	-	P16	-	M10	-	N10
SFNA20	-	400	-	F25	-	P15			-	N10

Alterations

Part Number	-	L	-	F	-	P	-	M (MD, ND)	-	N (NSC)	-	(LKC, WSC…etc.)
SFAA30	-	400	-	F25	-	P16	-	M10	-	N10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 …L±0.03 200≤L<500 …L±0.05 L≥500 …L±0.1
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between two set screw flats is not coplanar. D / W / ℓ1: 8 7, 10 8 (ℓ1 8); 12 10, 13 11, 15 13, 16 14, 18 16 (ℓ1 10); 20 17, 25 22 (ℓ1 10); 30 27, 35 30 (ℓ1 15); 40 36, 50 41 (ℓ1 20)
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D / h: 8~18 1; 20~40 2; 50 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D / h: 8~18 1; 20~40 2; 50 3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar. For details, see Shaft Alteration Overview. P.113
	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=6~30, M(N)=6~20 One End Tapped: MDx3.5+4≤L Both Ends Tapped: MDx3.5+4+NDx3.5+4≤L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFAA SFUE SFNA SFEU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAA SSFUE SSFNA SSFEU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	50																									
PSFAA PSFUE PSFNA PSFEU	8																	-	-	-	-	-	-	-	-	-
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	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFAA PSSFUE PSSFNA PSSFEU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	30																									
	35																									
	40																									
	50																									

• One End Stepped, Both Ends Tapped • One End Stepped, One End Tapped

Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAA RSFNA	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

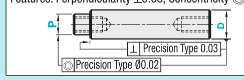
Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PSFGA PSNGA	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PSSFGA PSSNGA	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

One End Stepped, Both Ends Tapped with Wrench Flats

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



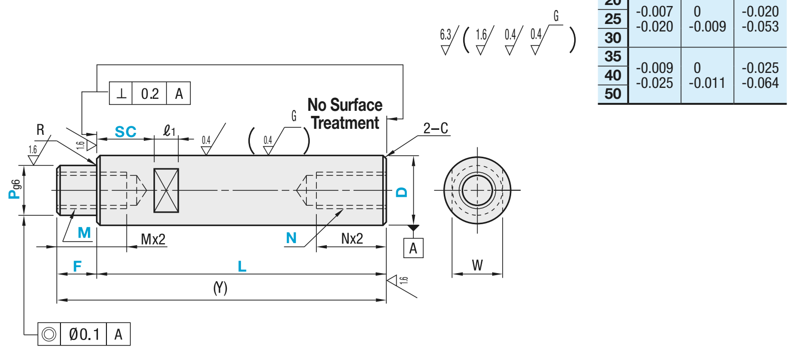
P.197

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.197.
■For Shafts w/o Wrench Flats, see P.133.

Annealing required for wrench flats machining and shaft end threading (effective thread length + approx. 10mm) may lower hardness. P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

Type D Tol. g6	Type D Tol. h5	Type D Tol. f8	M Material	H Hardness	S Surface Treatment
SFPPA	SFUP	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFPA	SSFUP	-	EN 1.4125 Equiv.		
PSFPA	PSFUP	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFPA	PSSFUP	-	EN 1.4125 Equiv.		
RSFPA	-	-	EN 1.3505 Equiv.	EN 1.4125 Equiv. 56HRC~	LTBC Plating
-	-	PFPGA	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More ~
-	-	PSFPGA	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			



Part Number Type	D	1mm Increment L	F	P	M (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	R	C
(D Tolerance g6) SFPPA SSFPA PSFPA PSSFPA RSFPA (D≤30, L≤500) (D Tolerance f8) PFPGA PSFPGA (D Tolerance h5) SFUP SSFUP PSFUP PSSFUP	8	25~798	2≤F≤Px4	6	3	3 4 5	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	800	0.3 or Less	0.5 or Less
	10	25~798		6~8	3 4 5	3 4 5 6		8		800		
	12	25~998		6~10	3 4 5 6	4 5 6 8		10	10	1000		
	13	25~998		6~11	3 4 5 6 8	4 5 6 8		11		1000		
	15	25~998		6~13	3 4 5 6 8 10	4 5 6 8 10		13		1000		
	16	25~1198		6~14	3 4 5 6 8 10	4 5 6 8 10		14		1200		
	18	25~1198		8~16	4 5 6 8 10 12	4 5 6 8 10 12		16		1200		
	20	25~1198		8~17	4 5 6 8 10 12	4 5 6 8 10 12		17		1200		1.0 or Less
	25	25~1198		8~22	4 5 6 8 10 12 16	4 5 6 8 10 12 16		22		1200		
	30	25~1498		9~27	5 6 8 10 12 16 20 24	6 8 10 12 16 20		27	15	1500		
	35	25~1498		9~32	5 6 8 10 12 16 20 24	8 10 12 16 20 24		30		1500	0.5 or Less	
	40	25~1498		11~37	6 8 10 12 16 20 24 30	10 12 16 20 24 30		36	20	1500		
	50	25~1498		11~47	6 8 10 12 16 20 24 30	12 16 20 24 30		41		1500		

P dimensions require M+3≤P.
When Mx2.5+4+Nx2.5+4≥(Y), tap pilot holes may go through. When Mx2+Nx2≥(Y), effective depth of larger diameter tap has priority.

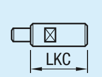
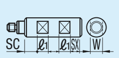
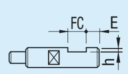
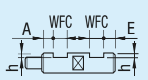
Ordering Example

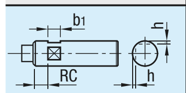
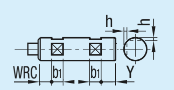
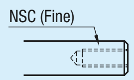
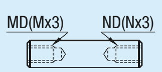
Part Number	-	L	-	F	-	P	-	M	-	N	-	SC
SFPPA20	-	400	-	F25	-	P16	-	M10	-	N10	-	SC10
SSFPA20	-	400	-	F25	-	P16	-	M10	-	N10	-	SC10

Alterations

Part Number	-	L	-	F	-	P	-	M (MD)	-	N (NSC, ND)	-	SC	-	(LKC, NSC···etc.)
SFPPA30	-	400	-	F25	-	P16	-	M10	-	N10	-	SC10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	SX	Second Set of Wrench Flats Ordering Code SX15 SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D W ℓ1: 8 7 8; 10 8; 12 10 10; 13 11; 15 13; 16 14; 18 16 D W ℓ1: 20 17 10; 25 22; 30 27 15; 35 30; 40 36 20; 50 41
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D h: 8~18 1; 20~40 2; 50 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D h: 8~18 1; 20~40 2; 50 3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar. For details, see Shaft Alteration Overview. P.113
	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=8~30, M(N)=6~20 Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFPPA SFUP	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFPA SSFUP	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFPA PSFUP	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFPA PSSFUP	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

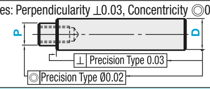
Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFPA	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1496
PFPGA	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1496
PSFPGA	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

One End Stepped and Tapped / One End Stepped

High Precision Linear Shafts when high precision assembly is needed	
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02 	P.199

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.199.
■For Shafts with Wrench Flats, see P.139.

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112

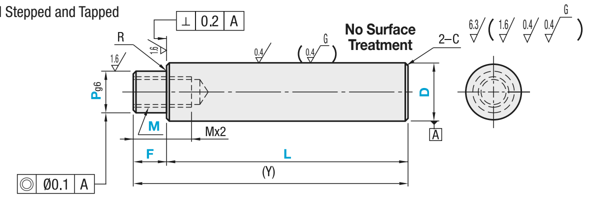
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

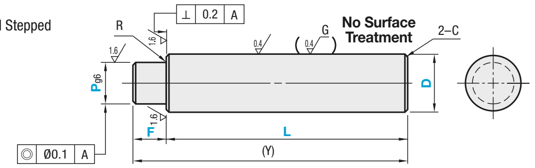
Type						M Material	H Hardness	S Surface Treatment
One End Stepped and Tapped			One End Stepped					
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. h5	D Tol. f8			
SFAG	SFUG	-	SFAC	SFCU	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 56HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAG	SSFUG	-	SSFAC	SSFCU	-	EN 1.4125 Equiv.		
PSFAG	PSFUG	-	PSFAC	PSFCU	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAG	PSSFUG	-	PSSFAC	PSSFCU	-	EN 1.4125 Equiv.		
RSFAG	-	-	RSFAC	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGG	-	-	PSCGC	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGG	-	-	PSSCGC	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

One End Stepped and Tapped



One End Stepped



Part Number Type				D	1mm Increment L	F	P	M (Coarse) Selection	(Y) Max.	R	C
One End Stepped and Tapped (D Tol. g6) SFAG SSFAG PSFAG PSSFAG RSFAG (D≤30, L≤500)	(D Tol. h5) SFUG SSFUG PSFUG PSSFUG	One End Stepped (D Tol. g6) SFAC SSFAC PSFAC PSSFAC RSFAC (D≤30, L≤500)	(D Tol. h5) SFCU SSFCU PSFCU PSSFCU	8	25~798	2≤F≤Px4	6	3	800	0.3 or Less	0.5 or Less
(D Tolerance f8) PSFGG PSSFGG		(D Tolerance f8) PSCGC PSSCGC		10	25~798		6~8	3 4 5	800		
				12	25~998		6~10	3 4 5 6	1000		
				13	25~998		6~11	3 4 5 6 8	1000		
				15	25~998		6~13	3 4 5 6 8 10	1000		
				16	25~1198		6~14	3 4 5 6 8 10	1200		
				18	25~1198		8~16	4 5 6 8 10 12	1200		
				20	25~1198		8~17	4 5 6 8 10 12	1200		
				25	25~1198		8~22	4 5 6 8 10 12 16	1200		
				30	25~1498		9~27	5 6 8 10 12 16 20 24	1500	0.5 or Less	1.0 or Less
				35	25~1498		9~32	5 6 8 10 12 16 20 24	1500		
				40	25~1498		11~37	6 8 10 12 16 20 24 30	1500		
				50	25~1498		11~47	6 8 10 12 16 20 24 30	1500		

•One End Stepped and Tapped P dimensions require M+3≤P. When Mx2.5+4≥Y, tap pilot holes may go through.

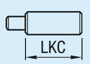
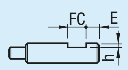
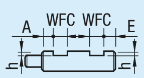
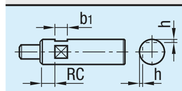
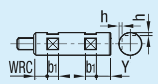
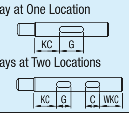
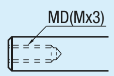
Ordering Example

Part Number		L		F		P		M
SFAG20	-	400	-	F25	-	P16	-	M10
SFUG20	-	400	-	F25	-	P16	-	M10
SFAC20	-	500	-	F25	-	P16		

Alterations

Part Number	-	L	-	F	-	P	-	M (MD)	-	(LKC, FC···etc.)
SFAG30	-	400	-	F25	-	P16	-	M10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
 FC E h	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D / h: 8~18 / 1; 20~40 / 2; 50 / 3
 A WFC WFC E h	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D / h: 8~18 / 1; 20~40 / 2; 50 / 3
 b1 RC h	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
 h WRC b1 b1 Y	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar. For details, see Shaft Alteration Overview. P.113
• Keyway at One Location :KC • Keyways at Two Locations :WKC  KC G C WKC	KC WKC	Keyway Ordering Code KC10-G10 WKC10-C8-KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.
 MD(Mx3)	MD	Change the effective length of tapped part to Mx3. Ordering Code MD6 (M is changed to MD) Application Notes Only applicable to D=8~30, M=6~20 One End Tapped: MDx3.5+4≥L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFAG SFUG SFAC SFCU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAG SSFUG SSFAC SSFCU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFAG PSFUG PSFAC PSFCU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFAG PSSFUG PSSFAC PSSFCU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

•One End Stepped and Tapped •One End Stepped

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAG RSFAC	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PSFGG PSCGC	8, 10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

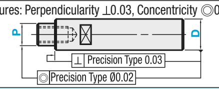
Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PSSFGG PSSCGC	8, 10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

One End Stepped and Tapped with Wrench Flats

High Precision Linear Shafts when high precision assembly is needed

Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



P.199

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.199.
■For Shafts w/o Wrench Flats, see P.137.

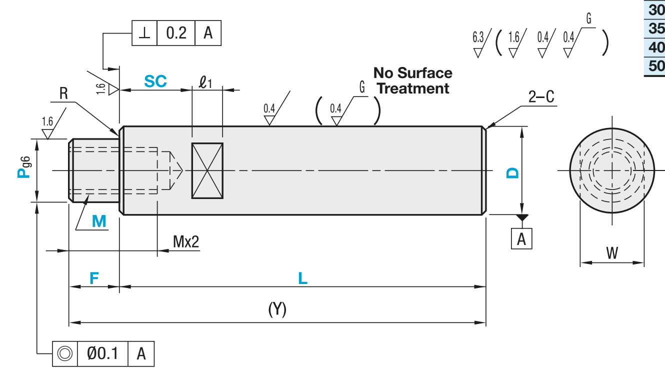
Annealing required for wrench flats machining and shaft end threading (thread effective length + approx. 10mm) may lower hardness. P.112

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

Type			M Material	H Hardness	S Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFPG	SFPU	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFPG	SSFPU	-	EN 1.4125 Equiv.		
PSFPG	PSFPU	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFPG	PSSFPU	-	EN 1.4125 Equiv.		
RSFPG	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PFPGG	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSFPGG	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064



Part Number		1mm Increment			M (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	R	C
Type	D	L	F	P		SC	W	ℓ1			
(D Tolerance g6) SFPG, SSFPG, PSFPG, PSSFPG, RSFPG (D≤30, L≤500) (D Tolerance h5) SFPU, SSFPU, PSFPU, PSSFPU (D Tolerance f8) PFPGG, PSFPGG	8	25~798	2≤F≤Px4	6	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	800	0.3 or Less	0.5 or Less
	10	25~798		6~8	3 4 5		8		800		
	12	25~998		6~10	3 4 5 6		10	10	1000		
	13	25~998		6~11	3 4 5 6 8		11		1000		
	15	25~998		6~13	3 4 5 6 8 10		13		1000		
	16	25~1198		6~14	3 4 5 6 8 10		14		1200		
	18	25~1198		8~16	4 5 6 8 10 12		16		1200		
	20	25~1198		8~17	4 5 6 8 10 12		17		1200		1.0 or Less
	25	25~1198		8~22	4 5 6 8 10 12 16		22		1200		
	30	25~1498		9~27	5 6 8 10 12 16 20 24		27	15	1500		
	35	25~1498		9~32	5 6 8 10 12 16 20 24		30		1500	0.5 or Less	
	40	25~1498		11~37	6 8 10 12 16 20 24 30		36	20	1500		
	50	25~1498		11~47	6 8 10 12 16 20 24 30		41		1500		

P dimensions require M+3≤P. (Y) dimensions require Mx4≤(Y). Tap pilot holes may go through.

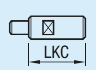
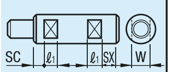
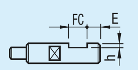
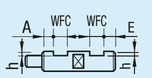
Ordering Example

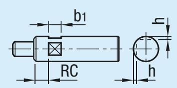
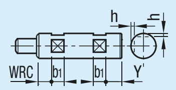
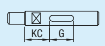
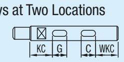
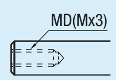
Part Number	-	L	-	F	-	P	-	M	-	SC
SFPG20	-	400	-	F25	-	P16	-	M10	-	SC10
SFPU20	-	500	-	F25	-	P16	-	M10	-	SC10

Alterations

Part Number	-	L	-	F	-	P	-	M (MD)	-	SC	-	(LKC, FC···etc.)
SFPG30	-	400	-	F25	-	P16	-	M10	-	SC10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	SX	Second Set of Wrench Flats Ordering Code SX15 SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D / W / ℓ1: 8 / 7 / 8; 10 / 8 / 8; 12 / 10 / 10; 13 / 11 / 10; 15 / 13 / 10; 16 / 14 / 10; 18 / 16 / 10; 20 / 17 / 10; 25 / 22 / 10; 30 / 27 / 15; 35 / 30 / 15; 40 / 36 / 20; 50 / 41 / 20
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D / h: 8~18 / 1; 20~40 / 2; 50 / 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D / h: 8~18 / 1; 20~40 / 2; 50 / 3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar. For details, see Shaft Alteration Overview. P.113
• Keyway at One Location :KC  • Keyways at Two Locations :WKC 	KC WKC	Keyway Ordering Code KC10-G10 WKC10-C8-KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.
	MD	Change the effective length of tapped part to Mx3. Ordering Code MD6 (M is changed to MD) Application Notes Only applicable to D=8~30, M=6~20 One End Tapped: MDx3.5+4≤L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
Alterations may lower hardness. See P.112

Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFPG SFPU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFPG SSFPU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFPG PSFPU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFPG PSSFPU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFPG	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

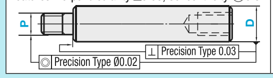
Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PFPGG	8, 10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PSFPGG	8, 10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

One End Threaded, One End Tapped

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



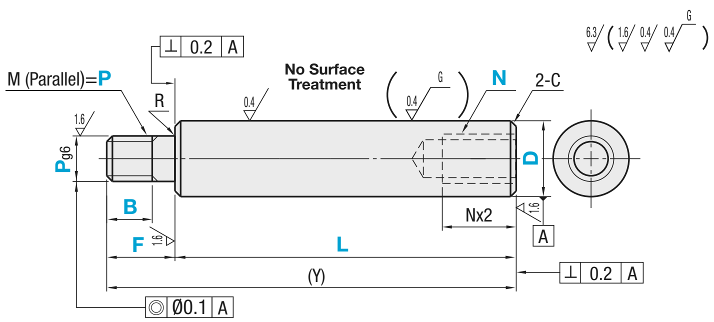
P.201

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.201.
■For Shafts with Wrench Flats / Cross-Drilled Hole, see P.143.

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFAD	SFUD	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAD	SSFUD	-	EN 1.4125 Equiv.		
PSFAD	PSFUD	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAD	PSSFUD	-	EN 1.4125 Equiv.		
RSFAD	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGD	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGD	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
4 5	-0.004 -0.012	0 -0.005	-
6			-0.010 -0.028
8 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12 13 15 16 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20 25 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35 40 50	-0.009 -0.025	0 -0.011	-0.025 -0.064



(D Tolerance g6) SFAD, SSFAD, PSFAD, PSSFAD, RSFAD (D≤30 L≤500)
(D Tolerance h5) SFUD, SSFUD, PSFUD, PSSFUD
(D Tolerance f8) PSFGD, PSSFGD

D	L (1mm Increment)	F (1mm Increment)	B (1mm Increment)	P (Coarse) Selection	N (Coarse) Selection	(Y) Max.	R	C
4	25~298			3 4	2	300	0.2 or Less	0.2 or Less
5	25~398			3 4 5	2.6 3	400		
6	25~598		(When P≤6) B≤F-2	3 4 5 6	3	600		
8	25~798			3 4 5 6 8	3 4 5	800		
10	25~798			4 5 6 8 10	3 4 5 6	800		0.5 or Less
12	25~998		(When P=8, 10) B≤F-3	5 6 8 10 12	4 5 6 8	1000		
13	25~998			5 6 8 10 12	4 5 6 8	1000	0.3 or Less	
15	25~998	2≤F≤Px5		5 6 8 10 12	4 5 6 8 10	1000		
16	25~1198		(When P≥12) B≤F-5	5 6 8 10 12 16	4 5 6 8 10	1200		
18	25~1198			5 6 8 10 12 16	4 5 6 8 10 12	1200		
20	25~1198		(W/o Threads) B=0	6 8 10 12 16 20	4 5 6 8 10 12	1200		
25	25~1198			8 10 12 16 20 24	4 5 6 8 10 12 16	1200		
30	25~1498			8 10 12 16 20 24 30	6 8 10 12 16 20	1500		1.0 or Less
35	25~1498		B≥Pitchx3	10 12 16 20 24 30	8 10 12 16 20 24	1500	0.5 or Less	
40	40~1498			12 16 20 24 30	10 12 16 20 24 30	1500		
50	50~1498			16 20 24 30	12 16 20 24 30	1500		

Coarse Thread Dimension M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

Overall length L requires Nx3≤L.
When D=P, specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimension of the product will be F -(Pitchx2).

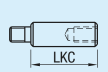
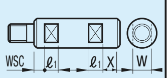
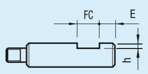
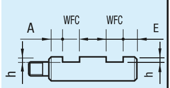
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	N
SFAD20	-	277	-	F25	-	B12	-	P10	-	N12

Alterations

Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	N (NSC, ND)	-	(LKC, WSC···etc.)
SFAD30	-	250	-	F40	-	B30	-	P10	-	N10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 Application Notes Applicable to D=6 or more WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.

WSC:

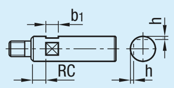
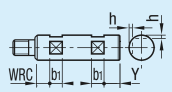
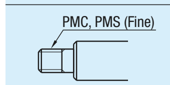
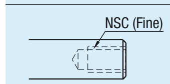
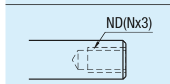
D	W	ℓ1	D	W	ℓ1
6	5		18	16	
8	7	8	20	17	10
10	8		25	22	
12	10		30	27	15
13	11	10	35	30	
15	13		40	36	20
16	14		50	41	

FC:

D	h
4~ 5	0.5
6~18	1
20~40	2
50	3

WFC:

D	h
4~ 5	0.5
6~18	1
20~40	2
50	3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar. For details, see Shaft Alteration Overview. P.113
	PMC PMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMS)
	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	ND	Change the effective length of tapped part to Nx3. Ordering Code ND6 (N is changed to ND) Application Notes Only applicable to D=6~30, N=6~20 One End Tapped: NDx3.5+4≥L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFAD / SFUD	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAD / SSFUD	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFAD / PSFUD	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	15																					-	-	-	-	-
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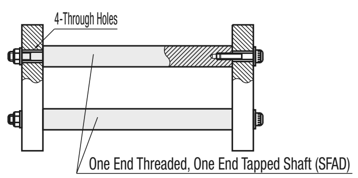
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFAD / PSSFUD	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAD	4						-	-
	5							-
	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

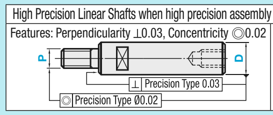
Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PSFGD	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGD	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Example



Shafts

One End Threaded One End Tapped with Wrench Flats / Cross-Drilled Hole



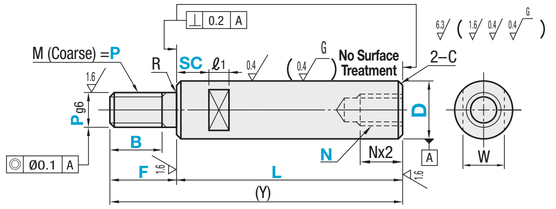
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.201.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.141.

- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

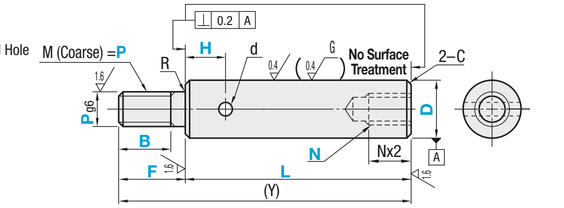
Type					Material	Hardness	Surface Treatment
With Wrench Flats			With Cross-Drilled Hole				
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
SFAZ	SFZU	-	SFZH	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAZ	SSFZU	-	SSFZH	-	EN 1.4125 Equiv.		-
PSFAZ	PSFZU	-	PSFZH	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAZ	PSSFZU	-	PSSFZH	-	EN 1.4125 Equiv.		
RSFAZ	-	-	RSFZH	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSGGZ	-	PSGZH	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSGGZ	-		EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

With Wrench Flats



With Cross-Drilled Hole (8≤D≤30,L≤500)



Part Number Type	D	L (1mm Increment)	F (1mm Increment)	B (1mm Increment)	P (Coarse) Selection	N (Coarse) Selection	SC (Wrench Flats Dimensions)	W	ℓ1	H (Cross-Drilled Hole Dimensions)	d	(Y) Max.	R	C
(With Wrench Flats) (D Tolerance g6) SFAZ, SSFAZ, PSFAZ, PSSFAZ, RSFAZ (D≤30 L≤500); (D Tolerance h5) SFZU, SSFZU, PSFZU, PSSFZU; (D Tol. f8) PSGGZ, PSSGGZ; (With Cross-Drilled Hole) 8≤D≤30, L≤500 (D Tolerance g6) SFZH, SSFZH, PSFZH, PSSFZH, RSFZH; (D Tol. f8) PSGZH	6	25~598	2≤F≤Px5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 (W/o Threads) B=0 B≥Pitchx3	3 4 5 6	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	H=1mm Increment L≥H+d/2+6+Nx2.5 H≥d/2+2	-	600	0.3 or Less	0.5 or Less
	8	25~798			3 4 5 6 8	3 4 5		7			3	800		
	10	25~798			4 5 6 8 10	3 4 5 6		8				800		
	12	25~998			5 6 8 10 12	4 5 6 8		10	10			1000		
	13	25~998			5 6 8 10 12	4 5 6 8		11			4	1000		
	15	25~998			5 6 8 10 12	4 5 6 8 10		13				1000		
	16	25~1198			5 6 8 10 12 16	4 5 6 8 10		14				1200		
	18	25~1198			5 6 8 10 12 16	4 5 6 8 10 12		16			6	1200		
	20	25~1198			6 8 10 12 16 20	4 5 6 8 10 12		17				1200		1.0 or Less
	25	25~1198			8 10 12 16 20 24	4 5 6 8 10 12 16		22			7	1200		
	30	25~1498			8 10 12 16 20 24 30	6 8 10 12 16 20		27	15			1500		
	35	25~1498			10 12 16 20 24 30	8 10 12 16 20 24		30			-	1500	0.5 or Less	
	40	40~1498			12 16 20 24 30	10 12 16 20 24 30		36	20			1500		
	50	50~1498			16 20 24 30	12 16 20 24 30		41				1500		

Coarse Thread Dimension	
M	pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

Overall length L requires Nx3≤L. When D=P, specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimension of the product will be F -(Pitchx2).

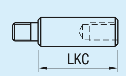
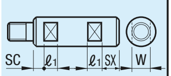
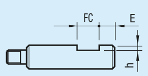
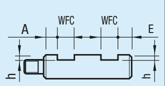
Ordering Example

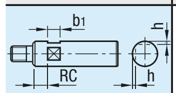
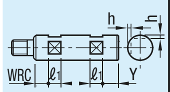
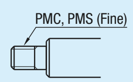
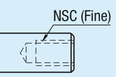
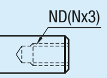
Part Number	-	L	-	F	-	B	-	P	-	N	-	SC	-	H
SFAZ20	-	277	-	F25	-	B12	-	P10	-	N12	-	SC10		
SSFZH20	-	277	-	F25	-	B12	-	P10	-	N12			-	H10

Alterations

Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	N (NSC)	-	SC	-	H	-	(LKC···etc.)
SFAZ30	-	250	-	F40	-	B30	-	P10	-	N10	-	SC10	-			LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D/W/ℓ1: 6/5/8, 8/7, 10/8, 12/10/10, 13/11, 15/13, 16/14; 18/16/10, 20/17, 25/22, 30/27/15, 35/30, 40/36/20, 50/41
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D/h: 6~18/1, 20~40/2, 50/3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D/h: 6~18/1, 20~40/2, 50/3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	PMC PMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMS)
	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	ND	Change the effective length of tapped part to Nx3. Ordering Code ND6 (N is changed to ND) Application Notes Only applicable to D=6~30, N=6~20 One End Tapped: NDx3.5+4≤L

For details, see Shaft Alteration Overview. P.113

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
- Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFAZ SFZU SFZH	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAZ SSFZU SSFZH	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
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	40																									
	50																									
PSFAZ PSFZU PSFZH	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
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	30																									
	35																									
	40																									
	50																									
PSSFAZ PSSFZU PSSFZH	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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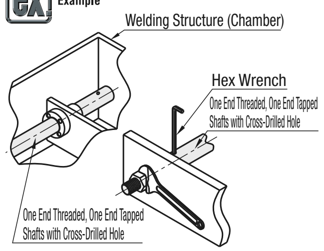
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAZ RSFZH	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

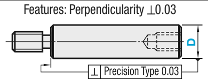
Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PSGGZ PSGZH	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSGGZ	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

ex Example



·Shafts with Cross-Drilled Hole are suitable for narrow work space.

Shafts
One End Threaded One End Tapped with Undercut

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03


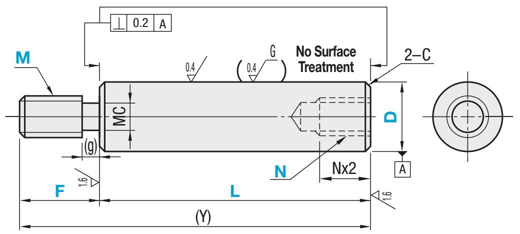
P.203

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.203.
■For Shafts with Wrench Flats / Cross-Drilled Hole, see P.147.

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SAFD	SFDU	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSAFD	SSFDU	-	EN 1.4125 Equiv.		
PSAFD	PSFDU	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSAFD	PSSFDU	-	EN 1.4125 Equiv.		
RSAFD	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSAGD	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSAGD	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064



Part Number		1mm Increment		M (Coarse) Selection	M (Coarse) Selection	(Y) Max.	C
Type	D	L	F				
(D Tolerance g6) SAFD SSAFD PSAFD PSSAFD RSAFD (D≤30, L≤500) (D Tolerance h5) SFDU SSFDU PSFDU PSSFDU (D Tolerance f8) PSAGD PSSAGD	8	25~ 795	5≤F≤Mx3	6	3 4 5	800	0.5 or Less
	10	25~ 795		6 8	3 4 5 6	800	
	12	25~ 995		6 8 10	4 5 6 8	1000	
	13	25~ 995		6 8 10 12	4 5 6 8	1000	
	15	25~ 995		6 8 10 12	4 5 6 8 10	1000	
	16	25~1195		6 8 10 12	4 5 6 8 10	1200	
	18	25~1195		6 8 10 12 16	4 5 6 8 10 12	1200	
	20	25~1195		6 8 10 12 16	4 5 6 8 10 12	1200	
	25	25~1193		8 10 12 16 20 24	4 5 6 8 10 12 16	1200	1.0 or Less
	30	25~1493		8 10 12 16 20 24	6 8 10 12 16 20	1500	
	35	25~1492		10 12 16 20 24 30	8 10 12 16 20 24	1500	
	40	40~1490		12 16 20 24 30	10 12 16 20 24 30	1500	
	50	50~1490		16 20 24 30	12 16 20 24 30	1500	

Overall length L requires Nx3≤L.

Coarse Thread Undercut Dimension			
M	Pitch	MC	(g)
6	1.0	4.4	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

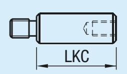
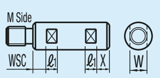
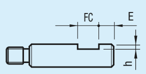
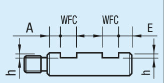
Ordering Example

Part Number	-	L	-	F	-	M	-	N
SAFD20	-	277	-	F25	-	M10	-	N12

Alterations

Part Number	-	L	-	F	-	M (MMC, MMS)	-	N (NSC, ND)	-	(LKC···etc.)
SAFD30	-	250	-	F40	-	M20	-	N20	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC ⊗Not applicable when D-M≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 ⊗ Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 ⊗ Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 ⊗ Orientation between set screw flats is not coplanar. Not available in combination with FC.

WSC:

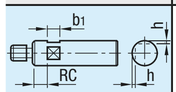
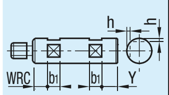
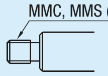
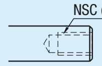
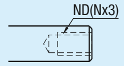
D	W	ℓ1	D	W	ℓ1
8	7	8	20	17	10
10	8		25	22	
12	10	10	30	27	15
13	11		35	30	
15	13		40	36	20
16	14		50	41	
18	16				

FC:

D	h
8~18	1
20~40	2
50	3

WFC:

D	h
8~18	1
20~40	2
50	3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. ⊗Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. ⊗Not available in combination with RC. ⊗Orientation between two set screw flats is not coplanar.
MMC, MMS (Fine) 	MMC MMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS)
NSC (Fine) 	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
ND(Nx3) 	ND	Change the effective length of tapped part to Nx3. Ordering Code ND6 (N is changed to ND) Application Notes Only applicable to D=8~30, N=6~20 One End Tapped: NDx3.5+4≥L

For details, see Shaft Alteration Overview. P.113

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1493
SAFD SFDU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSAFD SSFDU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSAFD PSFDU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSAFD PSSFDU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

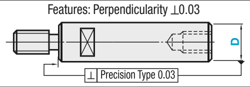
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSAFD	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1493
PSAGD	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSAGD	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

One End Threaded One End Tapped with Undercut and Wrench Flats / Cross-Drilled Hole

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03



P.203

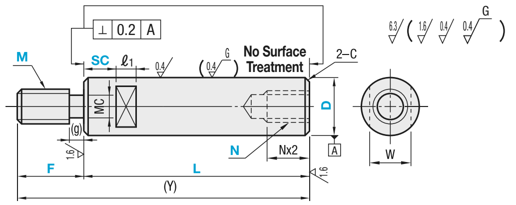
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.203.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.145.

Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

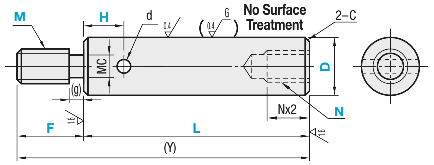
Type					Material	Hardness	Surface Treatment
With Wrench Flats			With Cross-Drilled Hole				
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
SAFZ	SFBU	-	SAHD	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSAFZ	SSFBU	-	SSAHD	-	EN 1.4125 Equiv.		
PSAFZ	PSFBU	-	PSAHD	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSAFZ	PSSFBU	-	PSSAHD	-	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	
RSAFZ	-	-	RSAHD	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSAGZ	-	PSHGD	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSAGZ	-	-	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

With Wrench Flats



With Cross-Drilled Hole
(D≤30, L≤500)



Part Number Type			D	1mm Increment L	F	M (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	(Y) Max.	C
(With Wrench Flats) (Tol. g6) SAFZ SSAFZ PSAFZ PSSAFZ RSAFZ (D≤30, L≤500) (Tol. f8) PSAGZ PSSAGZ	(With Wrench Flats) (Tol. h5) SFBU SSFBU PSFBU PSSFBU	(With Cross-Drilled Hole) D≤30, L≤500 (Tol. g6) SAHD SSAHD PSAHD PSSAHD RSAHD (Tol. f8) SHGD	8	25~795	5≤F≤Mx3 F-g≥Pitchx3	6	3 4 5	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	H=1mm Increment L≥H+d/2+6+Nx2.5 H≥d/2+2	3	800	0.5 or Less
			10	25~795		6 8	3 4 5 6		8				800	
			12	25~995		6 8 10	4 5 6 8		10	10			1000	
			13	25~995		6 8 10 12	4 5 6 8		11			4	1000	
			15	25~995		6 8 10 12	4 5 6 8 10		13				1000	
			16	25~1195		6 8 10 12	4 5 6 8 10		14				1200	
			18	25~1195		6 8 10 12 16	4 5 6 8 10 12		16			6	1200	
			20	25~1195		6 8 10 12 16	4 5 6 8 10 12		17				1200	
			25	25~1193		8 10 12 16 20 24	4 5 6 8 10 12 16		22			7	1200	1.0 or Less
			30	25~1493		8 10 12 16 20 24	6 8 10 12 16 20		27	15			1500	
			35	25~1492		10 12 16 20 24 30	8 10 12 16 20 24		30			-	1500	
			40	40~1490		12 16 20 24 30	10 12 16 20 24 30		36	20			1500	
			50	50~1490		16 20 24 30	12 16 20 24 30		41				1500	

Overall length L requires Nx3≤L.

Coarse Thread Undercut Dimension

M	Pitch	MC	Undercut (g)
6	1.0	4.4	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

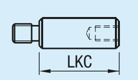
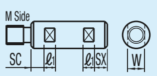
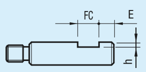
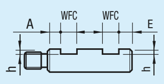
Ordering Example

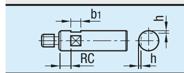
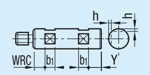
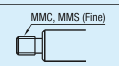
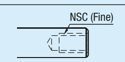
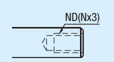
Part Number	-	L	-	F	-	M	-	N	-	SC	-	H
SAFZ20	-	277	-	F25	-	M10	-	N12	-	SC10		
SSAHD20	-	277	-	F25	-	M12	-	N12			-	H10

Alterations

Part Number	-	L	-	F	-	M (MMC, MMS)	-	N (NSC, ND)	-	SC	-	H	-	(LKC···etc.)
SAFZ30	-	250	-	F40	-	M20	-	N20	-	SC10	-			LKC

Alteration Details P.113

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance. Ordering Code LKC. Not applicable when D-M≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03; 200≤L<500 ···L±0.05; L≥500 ···L±0.1
 M Side SC ℓ1 ℓ1 SX W	SX	Second Set of Wrench Flats. Ordering Code SX15. Application Notes: Only applicable to Shafts with Wrench Flats. SX=1mm Increment. SC+SX+ℓ1x2<L; SX≥0; Orientation between two set screw flats is not coplanar. (D / W / ℓ1: 8 / 7 / 8; 10 / 8 / 8; 12 / 10 / 10; 13 / 11 / 10; 15 / 13 / 10; 16 / 14 / 10; 18 / 16 / 10; 20 / 17 / 10; 25 / 22 / 10; 30 / 27 / 15; 35 / 30 / 15; 40 / 36 / 20; 50 / 41 / 20)
 FC E	FC	Set Screw Flat at One Location. Ordering Code FC10-E8. FC, E=1mm Increment. FC≤3xD; When 1.5xD<FC, FC≤L/2; E=0 or E≥2; Not available in combination with WFC. (D / h: 8~18 / 1; 20~40 / 2; 50 / 3)
 A WFC WFC E	WFC	Set Screw Flats at Two Locations. Ordering Code WFC8-A8-E4. WFC,A,E=1mm Increment. WFC≤3xD; When 1.5xD<WFC, 2WFC≤L/2; A(E)=0 or A(E)≥2; Orientation between set screw flats is not coplanar. Not available in combination with FC. (D / h: 8~18 / 1; 20~40 / 2; 50 / 3)

Alterations	Code	Spec.
 b1 RC h	RC	90-deg. Set Screw Flat at One Location. Ordering Code RC10. Application Notes: Only applicable to D=10 ~ 30. Not available in combination with WRC. For details, see Shaft Alteration Overview. P.113
 h WRC b1 b1 Y	WRC	90-deg. Set Screw Flats at Two Locations. Ordering Code WRC10-Y10. Application Notes: Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
 MMC, MMS (Fine)	MMC MMS	Change to Fine Thread. Ordering Code MMC14 (M is changed to MMC), MMS14 (M is changed to MMS)
 NSC (Fine)	NSC	Change to Fine Tapped Thread. Ordering Code NSC14 (N is changed to NSC). Application Notes: Applicable to D=12 or more
 ND(Nx3)	ND	Change the effective length of tapped part to Nx3. Ordering Code ND6 (N is changed to ND). Application Notes: Only applicable to D=8~30, N=6~20. One End Tapped: NDx3.5+4≥L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1493
SAFZ SFBU SAHD	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSAFZ SSFBU SSAHD	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	35																									
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	50																									
PSAFZ PSFBU PSAHD	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	30																									
	35																									
	40																									
	50																									
PSSAFZ PSFBU PSAHD	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
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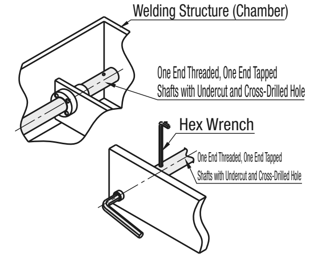
	40																									
	50																									

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSAFZ RSAHD	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1493
PSAGZ PSHGD	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSAGZ	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

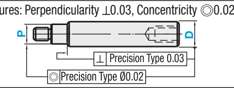
Example



·Shafts with Cross-Drilled Hole are suitable for narrow work space.

Shafts
One End Stepped and Threaded One End Tapped

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



P.205

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.205.

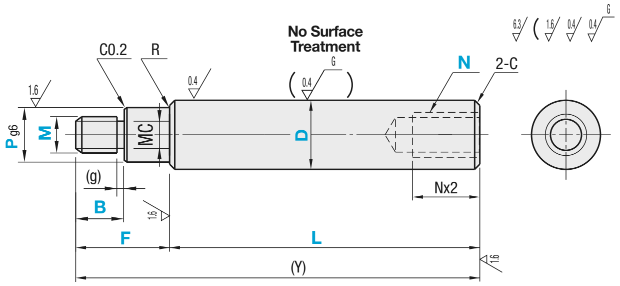
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

Type D Tol. g6	Type D Tol. h5	Type D Tol. f8	M Material	H Hardness	S Surface Treatment
SFAY	SFUY	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAY	SSFUY	-	EN 1.4125 Equiv.		
PSFAY	PSFUY	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFAY	PSSFUY	-	EN 1.4125 Equiv.		
RSFAY	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGY	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More ~
-	-	PSSFGY	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064



Part Number Type	D	1mm Increment L	F	B	P	M (Coarse) Selection	N (Coarse) Selection	(Y) Max.	R	C
(D Tolerance g6) SFAY SSFAY PSFAY PSSFAY RSFAY (D≤30, L≤500) / (D Tolerance h5) SFUY SSFUY PSFUY PSSFUY / (D Tolerance f8) PSFGY PSSFGY	8	25~ 790	10≤F≤Px5	Pitchx3+(g)≤B≤Mx3	M<P<D	6	3 4 5	800	0.3 or Less	0.5 or Less
	10	25~ 790				6 8	3 4 5 6	800		
	12	25~ 990				6 8 10	4 5 6 8	1000		
	13	25~ 990				6 8 10	4 5 6 8	1000		
	15	25~ 990				6 8 10 12	4 5 6 8 10	1000		
	16	25~1190				6 8 10 12	4 5 6 8 10	1200		
	18	25~1190				6 8 10 12 16	4 5 6 8 10 12	1200		
	20	25~1190				6 8 10 12 16	4 5 6 8 10 12	1200		1.0 or Less
	25	25~1190				8 10 12 16 20	4 5 6 8 10 12 16	1200		
	30	25~1490				8 10 12 16 20 24	6 8 10 12 16 20	1500		
	35	25~1480	20≤F≤Px5			10 12 16 20 24 30	8 10 12 16 20 24	1500	0.5 or Less	
	40	40~1480				12 16 20 24 30	10 12 16 20 24 30	1500		
	50	50~1480				16 20 24 30	12 16 20 24 30	1500		

Overall length L requires Nx3≤L. F-B≥2 is required.

Coarse Thread Undercut Dimension

M	Pitch	MC	(g)
6	1.0	4.4	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

Undercut Dimensions for Fine Threads①

MMC	Pitch	MC	(g)
6	0.75	4.8	2
8	1.0	6.4	
10		8.4	
12		10.4	
15		13.4	
17		15.4	
20		18.4	
25	1.5	22.7	3
30		27.7	

Undercut Dimensions for Fine Threads②

MMS	Pitch	MC	(g)
10	1.25	8	3
12	1.5	9.7	
14		11.7	
18		15.7	

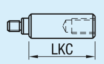
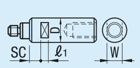
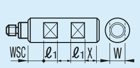
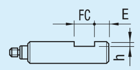
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	M	-	N
SFAY20	-	277	-	F25	-	B12	-	P10	-	M8	-	N12

Alterations

Part Number	-	L	-	F	-	B	-	P	-	M (MMC, MMS)	-	N (NSC, ND)	-	(LKC, SC···etc.)
SFAY30	-	250	-	F40	-	B20	-	P10	-	M8	-	N10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC ⊗ Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	SC	Wrench Flats at One Location Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0 ⊗Not available in combination with WSC.
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 ⊗Orientation between wrench flats is not coplanar. Not available in combination with SC.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 ⊗Not available in combination with WFC.

SC / WSC:

D	W	ℓ1
8	7	8
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

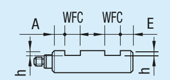
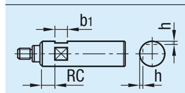
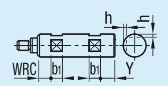
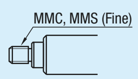
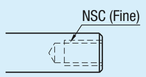
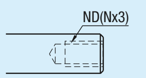
FC:

D	h
8~18	1
20~40	2
50	3

Please see Shaft Alteration Overview for details if provided. P.113

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.

Alterations may lower hardness. See P.112

Alterations	Code	Spec.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC10-A8-E20 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 ⊗Orientation between set screw flats is not coplanar. Not available in combination with FC.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. ⊗Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. ⊗Not available in combination with RC. ⊗Orientation between two set screw flats is not coplanar. For details, see Shaft Alteration Overview. P.113
	MMC MMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS)
	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	ND	Change the effective length of tapped part to Nx3. Ordering Code ND6 (N is changed to ND) Application Notes Only applicable to D=6~30, N=6~20 One End Tapped: NDx3.5+4≥L

WFC:

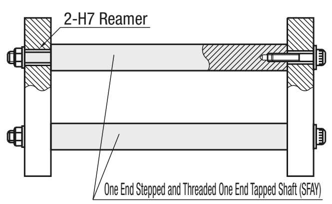
D	h
8~18	1
20~40	2
50	3

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1490
SFAY SFUY	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAY SSFUY	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFAY PSFUY	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFAY PSSFUY	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAY	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1490
PSFGY	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGY	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Example



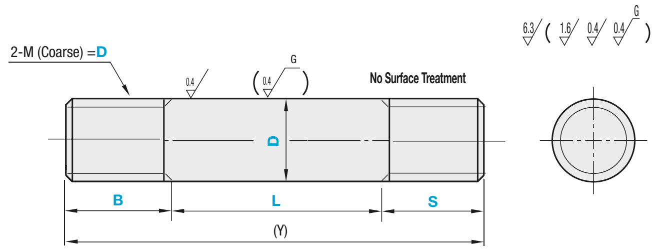
Shafts

Both Ends Threaded with O.D. same as Shaft O.D.

For One End Threaded Shafts with different diameters, see P.153.

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFAL	SFUL	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAL	SSFUL	-	EN 1.4125 Equiv.		
PSFAL	PSFUL	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAL	PSSFUL	-	EN 1.4125 Equiv.		
RSFAL	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGL	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGL	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
3	-0.002 -0.008	0 -0.004	-
4	-0.004 -0.012	0 -0.005	-
5			-
6			-0.010 -0.028
8 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12 16	-0.006 -0.017	0 -0.008	-0.016 -0.043
20 30	-0.007 -0.020	0 -0.009	-0.020 -0.053



- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

Part Number			1mm Increment		M	(Y) Max.	Coarse Thread Dimension	
Type		D	L	B, S			M	Pitch
(D Tolerance g6)	(D Tolerance h5)	3	25~194	3~15	3	200	3	0.5
SFAL	SFUL	4	25~292	4~20	4	300	4	0.7
SSFAL	SSFUL	5	25~392	4~25	5	400	5	0.8
PSFAL	PSFUL	6	25~590	5~30	6	600	6	1.0
PSSFAL	PSSFUL	8	25~786	7~40	8	800	8	1.25
RSFAL (L≤500,Ymax≤800)		10	25~784	8~50	10	800	10	1.5
		12	25~982	9~60	12	1000	12	1.75
(D Tolerance f8)		16	25~1180	10~80	16	1200	16	2.0
PSFGL (D≥6)		20	25~1174	13~100	20	1200	20	2.5
PSSFGL (D≥6)		30	25~1464	18~150	30	1500	30	3.5

- For One End Threaded with O.D. same as Shaft O.D., L dimensions have priority, thus the effective thread length of B(S) dimension will be B(S)-(Pitchx2).
- L does not include incomplete threads.

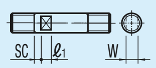
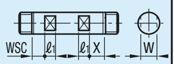
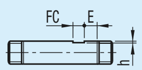
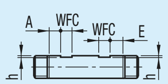
Ordering Example

Part Number	-	L	-	B	-	S
SFAL20	-	300	-	B20	-	S15

Alterations

Part Number	-	L	-	B	-	S	-	(SC···etc.)
SFAL30	-	300	-	B30	-	S40	-	SC10

Alteration Details P.113

Alterations	Code	Spec.
	SC	Wrench Flats at One Location Ordering Code SC5 Application Notes Applicable to D=6 or more SC=1mm Increment SC+ℓ1≤L SC≥0 Not available in combination with WSC.
	WSC	Second Set of Wrench Flats Ordering Code WSC15 WSC(X) =1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between two set screw flats is not coplanar. Not available in combination with SC.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC10-A8-E20 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.

SC / WSC:

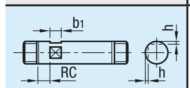
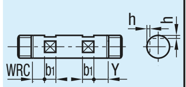
D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
16	14	
20	17	
30	27	15

FC:

D	h
3~ 5	0.5
6~16	1
20~30	2

WFC:

D	h
3~ 5	0.5
6~16	1
20~30	2

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.

For details, see Shaft Alteration Overview. P.113

- Please see Alteration Overview for details. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
- Alterations may lower hardness. See P.112

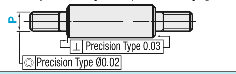
Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1464
SFAL / SFUL	3					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	16																							-	-	-
	20																							-	-	-
	30																									
SSFAL / SSFUL	3					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	16																							-	-	-
	20																							-	-	-
	30																									
PSFAL / PSFUL	3					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	16																							-	-	-
	20																							-	-	-
	30																									
PSSFAL / PSSFUL	3					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	16																							-	-	-
	20																							-	-	-
	30																									

Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAL	3					-	-	-
	4						-	-
	5							-
	6							
	8							
	10							
	12							
	16							
	20							
	30							

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1464
PSFGL	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12							-	-
	16								-
	20								-
	30								
PSSFGL	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12							-	-
	16								-
	20								-
	30								

Shafts
Both Ends Threaded

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



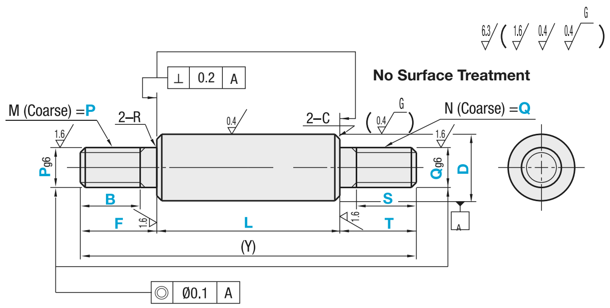
P.207

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.207.
■For Both Ends Threaded with Undercuts, see P.157. ■For Shafts with Wrench Flats and Cross-Drilled Hole, see P.155.

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFAM	SFUM	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFAM	SSFUM	-	EN 1.4125 Equiv.		
PSFAM	PSFUM	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 56HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAM	PSSFUM	-	EN 1.4125 Equiv.		
RSFAM	-	-	EN 1.3505 Equiv.	EN 1.4125 Equiv. 56HRC~	LTBC Plating
-	-	PSFGM	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGM	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
4	-0.004 -0.012	0 -0.005	-
5			
6			-0.010 -0.028
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			



Part Number			1mm Increment		P, Q	(Y)	R	C
Type		D	L	F, T	B, S	Selection	Max.		
(D Tol. g6) SFAM SSFAM PSFAM PSSFAM RSFAM (D≤30,L≤500,Ymax≤800)	(D Tol. h5) SFUM SSFUM PSFUM PSSFUM	4	25~296	2≤F≤Px5 2≤T≤Qx5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 (When Q≤6) S≤T-2 (When Q=8, 10) S≤T-3 (When Q≥12) S≤T-5 (W/o Threads) B=0 S=0 B, S≥Pitchx3	3	300	0.2 or Less	0.2 or Less
		5	25~396			3 4	400		
		6	25~596			3 4 5	600		
		8	25~796			3 4 5 6	800	0.3 or Less	0.5 or Less
		10	25~796			4 5 6 8	800		
		12	25~996			5 6 8 10	1000		
		13	25~996			5 6 8 10 12	1000		
		15	25~996			5 6 8 10 12	1000		
		16	25~1196			5 6 8 10 12	1200		
		18	25~1196			5 6 8 10 12 16	1200		
(D Tol. f8) PSFGM (D≥6) PSSFGM (D≥6)		20	25~1196			6 8 10 12 16	1200		1.0 or Less
		25	25~1196			8 10 12 16 20 24	1200		
		30	25~1496			8 10 12 16 20 24	1500		
		35	25~1496			10 12 16 20 24 30	1500	0.5 or Less	
		40	25~1496			12 16 20 24 30	1500		
		50	25~1496			16 20 24 30	1500		

Coarse Thread Dimension

M, N	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

Thread machining will not be applied to B=0 or S=0. D>P(Q)

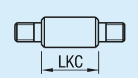
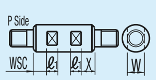
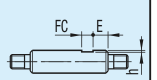
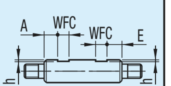
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	T	-	S	-	Q
SFAM20	-	300	-	F30	-	B20	-	P8	-	T20	-	S15	-	Q10

Alterations

Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	T	-	S	-	Q (QMC, QMS)	-	(LKC···etc.)
SFAM30	-	300	-	F40	-	B30	-	P20	-	T50	-	S40	-	Q16	-	LKC

Alteration Details P.113

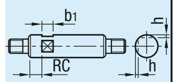
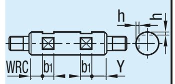
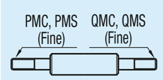
Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P(Q)≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 Application Notes Applicable to D=6 or more WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.

WSC:

D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8		25	22	
12	10	10	30	27	15
13	11		35	30	
15	13		40	36	20
16	14		50	41	

FC / WFC:

D	h
4~5	0.5
6~18	1
20~40	2
50	3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	PMC PMS QMC QMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMS) QMC14 (Q is changed to QMC) QMS14 (Q is changed to QMS)

For details, see Shaft Alteration Overview. P.113

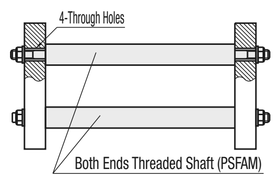
Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1496
SFAM SFUM	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAM SSFUM	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFAM PSFUM	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFAM PSSFUM	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAM	4						-	-
	5							-
	6							
	8							
	10							
	12, 13							
	15, 16							
	18, 20							
	25							
	30							

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1496
PSFGM	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGM	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

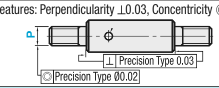
Example



Shafts

Both Ends Threaded with Wrench Flats / Cross-Drilled Hole

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



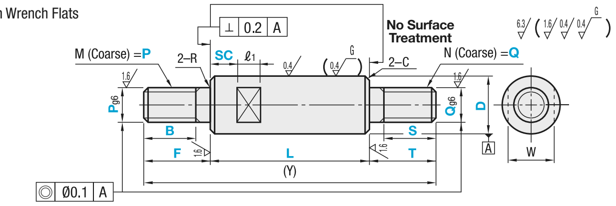
P.207

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see **P.207**.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see **P.153.**

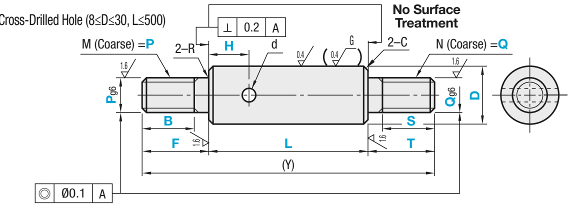
Type					M Material	H Hardness	S Surface Treatment
With Wrench Flats			With Cross-Drilled Hole				
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
SFAU	SFUU	-	SFHM	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFAU	SSFUU	-	SSFHM	-	EN 1.4125 Equiv.		
PSFAU	PSFUU	-	PSFHM	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAU	PSSFUU	-	PSSFHM	-	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	
RSFAU	-	-	RSFHM	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGU	-	PSGHM	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGU	-	-	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

With Wrench Flats



With Cross-Drilled Hole (8≤D≤30, L≤500)



- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

Part Number Type	D	1mm Increment L	1mm Increment F, T	B, S	P, Q Selection	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	(Y) Max.	R	C
(With Wrench Flats) (D Tol. g6) SFAU SSFAU PSFAU PSSFAU RSFAU (D≤30,L≤500,Ymax≤800) (D Tol. h5) SFUU SSFUU PSFUU PSSFUU (D Tol. f8) PSFGU PSSFGU (With Cross-Drilled Hole) 8≤D≤30, L≤500 (D Tol. g6) SFHM SSFHM PSFHM PSSFHM RSFHM (D Tol. f8) PSGHM	6	25~596	2≤F≤Px5 2≤T≤Qx5	(When P≤6)	3 4 5	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	H=1mm Increment L≥H+d/2+2 H≥d/2+2	-	600	0.3 or Less	0.5 or Less
	8	25~796		B≤F-2	3 4 5 6		7			3	800		
	10	25~796		(When P=8, 10)	4 5 6 8		8				800		
	12	25~996		B≤F-3	5 6 8 10		10	10		4	1000		
	13	25~996		(When P≥12)	5 6 8 10 12		11				1000		
	15	25~996		B≤F-5	5 6 8 10 12		13				1000		
	16	25~1196		(When Q≤6)	5 6 8 10 12		14				1200		
	18	25~1196		S≤T-2	5 6 8 10 12 16		16			6	1200		
	20	25~1196		(When Q=8, 10)	6 8 10 12 16		17				1200		
	25	25~1196		S≤T-3	8 10 12 16 20 24		22			7	1200		1.0 or Less
	30	25~1496		(When Q≥12)	8 10 12 16 20 24		27	15			1500		
	35	25~1496		S≤T-5	10 12 16 20 24 30		30			-	1500	0.5 or Less	
	40	25~1496		(W/o Threads) B=0	12 16 20 24 30		36	20			1500		
	50	25~1496		S=0 B, S≥Pitchx3	16 20 24 30		41				1500		

Coarse Thread Dimension	
M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

Thread machining will not be applied to B=0 or S=0.

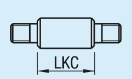
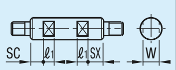
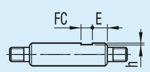
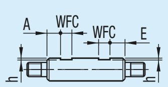
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	T	-	S	-	Q	-	SC	-	H
SFHM15	-	300	-	F28	-	B16	-	P6	-	T17	-	S12	-	Q12			-	H8

Alterations

Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	T	-	S	-	Q (QMC, QMS)	-	SC	-	H	-	(LKC···etc.)
SFAU30	-	300	-	F40	-	B30	-	P20	-	T50	-	S40	-	Q16	-	SC10			-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P(Q)≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···→L±0.03 200≤L<500 ···→L±0.05 L≥500 ···→L±0.1
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.

SX:

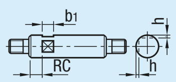
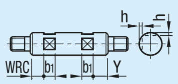
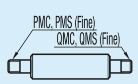
D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8		25	22	
12	10	10	30	27	15
13	11		35	30	
15	13		40	36	20
16	14		50	41	

FC:

D	h
6~18	1
20~40	2
50	3

WFC:

D	h
6~18	1
20~40	2
50	3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	PMC PMS QMC QMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMC) QMC14 (Q is changed to QMC) QMS14 (Q is changed to QMS)

For details, see Shaft Alteration Overview. P.113

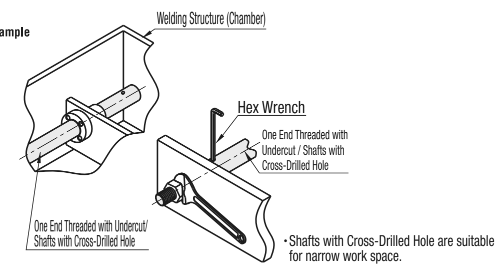
- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
- Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1496
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
SFAU	15																					-	-	-	-	-
SFUU	16																							-	-	-
	18																							-	-	-
SFHM	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
SSFAU	15																					-	-	-	-	-
SSFUU	16																							-	-	-
	18																							-	-	-
SSFHM	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
PSFAU	15																					-	-	-	-	-
PSFUU	16																							-	-	-
	18																							-	-	-
PSFHM	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
PSSFAU	15																					-	-	-	-	-
PSSFUU	16																							-	-	-
	18																							-	-	-
PSSFHM	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
	6							
	8							
	10							
	12							
RSFAU	13							
	15							
RSFHM	16							
	18							
	20							
	25							
	30							

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1496
	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
PSFGU	15, 16								-
	18, 20								-
PSGHM	25								-
	30								
	35								
	40								
	50								
	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
PSSFGU	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Example

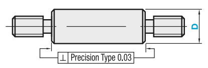


- Shafts with Cross-Drilled Hole are suitable for narrow work space.

Shafts

Both Ends Threaded with Undercuts

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03



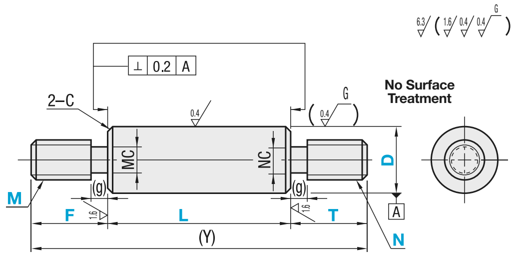
P.209

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see **P.209**.

- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). **P.112**
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness **P.111**
- Features of LTBC Plating **P.128**

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SAFM	SFMU	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSAFM	SSFMU	-	EN 1.4125 Equiv.		
PSAFM	PSFMU	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSAFM	PSSFMU	-	EN 1.4125 Equiv.		
RSAFM	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSAGM	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSAGM	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064



Part Number			1mm Increment		Selection	(Y)	C
Type		D	L	F, T	M, N (Coarse)	Max.	
(D Tolerance g6) SAFM SSAFM PSAFM PSSAFM RSAFM (D≤30,L≤500,Ymax≤800) (D Tol. f8) PSAGM PSSAGM	(D Tolerance h5) SFMU SSFMU PSFMU PSSFMU	8	25~790	5≤F≤Mx3 5≤T≤Nx3 F-(g)≥Pitchx3 T-(g)≥Pitchx3	6	800	0.5 or Less
		10	25~790		6 8	800	
		12	25~990		6 8 10	1000	
		13	25~990		6 8 10 12	1000	
		15	25~990		6 8 10 12	1000	
		16	25~1190		6 8 10 12	1200	
		18	25~1190		6 8 10 12 16	1200	
		20	25~1190		6 8 10 12 16	1200	1.0 or Less
		25	25~1190		8 10 12 16 20 24	1200	
		30	25~1490		8 10 12 16 20 24	1500	
		35	25~1490		10 12 16 20 24 30	1500	
		40	25~1490		12 16 20 24 30	1500	
		50	25~1490		16 20 24 30	1500	

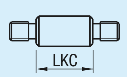
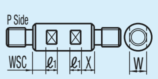
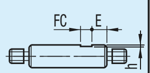
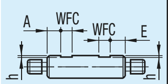
Coarse Thread Undercut Dimension

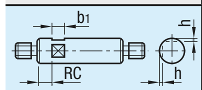
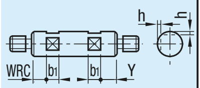
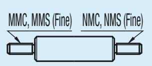
M N	Pitch	MC NC	(g)
6	1.0	4.4	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

Ordering Example: Part Number - L - F - M - T - N

Alterations: Part Number - L - F - M (MMC, MMS) - T - N - (LKC···etc.)
SAFM30 - 300 - F40 - M20 - T48 - N16 - LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-M(N)≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC,X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between two set screw flats is not coplanar. D / W / ℓ1: 8 / 7 / 8; 10 / 8; 12 / 10; 13 / 11 / 10; 15 / 13; 16 / 14; 18 / 16; 20 / 17 / 10; 25 / 22; 30 / 27 / 15; 35 / 30; 40 / 36 / 20; 50 / 41
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 A=0 or A≥2 Not available in combination with WFC. D / h: 8~18 / 1; 20~40 / 2; 50 / 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D / h: 8~18 / 1; 20~40 / 2; 50 / 3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC. For details, see Shaft Alteration Overview. P.113
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	MMC MMS NMC NMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS) NMC14 (N is changed to NMC) NMS14 (N is changed to NMS)

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
- Alterations may lower hardness. See P.112

Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1490
SAFM SFMU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSAFM SSFMU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
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	30																									
	35																									
	40																									
	50																									
PSAFM PSFMU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSAFM PSSFMU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

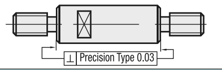
Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSAFM	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1490
PSAGM	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSAGM	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Shafts

Both Ends Threaded with Undercuts and Wrench Flats / Cross-Drilled Hole

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03



P.209

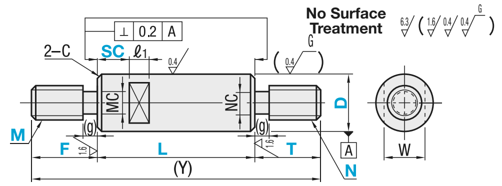
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.209.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.157.

- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

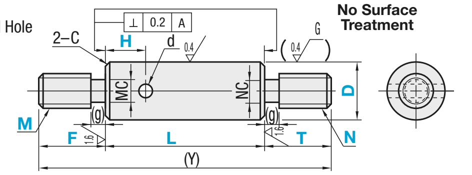
Type					M Material	H Hardness	S Surface Treatment
With Wrench Flats			With Cross-Drilled Hole				
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
SAFU	SFFU	-	SFHAM	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSAFU	SSFFU	-	SSHAM	-	EN 1.4125 Equiv.		
PSAFU	PSFFU	-	PSHAM	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSAFU	PSSFFU	-	PSSHAM	-	EN 1.4125 Equiv.		
RSAFU	-	-	RSHAM	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSAGU	-	PSHGM	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSAGU	-	-	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

With Wrench Flats



With Cross-Drilled Hole (D≤30, L≤500)



Part Number — Type

(With Wrench Flats)
(D Tol. g6): SAFU, SSAFU, PSAFU, PSSAFU, RSAFU (D≤30, L≤500, Ymax≤800)
(D Tol. h5): SFFU, SSFFU, PSFFU, PSSFFU
(D Tol. f8): PSAGU, PSSAGU

(With Cross-Drilled Hole) D≤30, L≤500
(D Tol. g6): SFHAM, SSHAM, PSHAM, PSSHAM, RSHAM
(D Tol. f8): PSHGM

D	L (1mm Increment)	F, T (1mm Increment)	M, N (Coarse) (Selection)	SC (Wrench Flats Dimensions)	W	ℓ1	H (Cross-Drilled Hole Dimensions)	d	(Y) Max.	C
8	25~790	5≤F≤Mx3 5≤T≤Nx3 F-(g)≥Pitchx3 T-(g)≥Pitchx3	6	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	H=1mm Increment L≥H+d/2+2 H≥d/2+2	3	800	0.5 or Less
10	25~790		6 8		8				800	
12	25~990		6 8 10		10	10			1000	
13	25~990		6 8 10 12		11			4	1000	
15	25~990		6 8 10 12		13				1000	
16	25~1190		6 8 10 12		14				1200	
18	25~1190		6 8 10 12 16		16			6	1200	
20	25~1190		6 8 10 12 16		17				1200	1.0 or Less
25	25~1190		8 10 12 16 20 24		22			7	1200	
30	25~1490		8 10 12 16 20 24		27	15			1500	
35	25~1490		10 12 16 20 24 30		30			-	1500	
40	25~1490		12 16 20 24 30		36	20			1500	
50	25~1490		16 20 24 30		41				1500	

Coarse Thread Undercut Dimension

M N	Pitch	MC NC	(g)
6	1.0	4.4	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

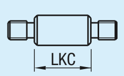
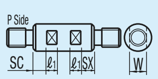
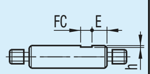
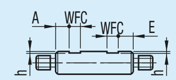
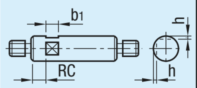
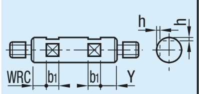
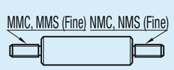
Ordering Example

Part Number	-	L	-	F	-	M	-	T	-	N	-	SC	-	H
SAFU15	-	300	-	F18	-	M6	-	T17	-	N12	-	SC8		
SFHAM15	-	300	-	F18	-	M6	-	T17	-	N12			-	H8

Alterations

Part Number	-	L	-	F	-	M (MMC, MMS)	-	T	-	N (NMC, NMS)	-	SC	-	H	-	(LKC···etc.)
SAFU30	-	300	-	F40	-	M20	-	T48	-	N16	-	SC20			-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-M(N)≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500···L±0.05 L≥500 ···L±0.1
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Applicable to Shafts with Wrench Flats only. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	MMC MMS NMC NMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMSC) NMC14 (N is changed to NMC) NMS14 (N is changed to NMS)

SX:

D	W	ℓ1
8	7	8
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

FC / WFC:

D	h
8~18	1
20~40	2
50	3

For details, see Shaft Alteration Overview. P.113

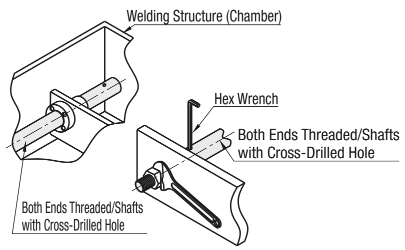
- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
- Alterations may lower hardness. P.112

Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1490
SAFU SFFU SFHAM	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSAFU SSFFU SSHAM	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSAFU PSFFU PSHAM	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSAFU PSSFFU PSSHAM	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSAFU RSHAM	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1490
PSAGU PSHGM	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSAGU	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Example



• Shafts with Cross-Drilled Hole are suitable for narrow work space.

Shafts

One End Threaded with O.D. same as Shaft O.D.

For One End Threaded Shafts with different diameters, see P.163.

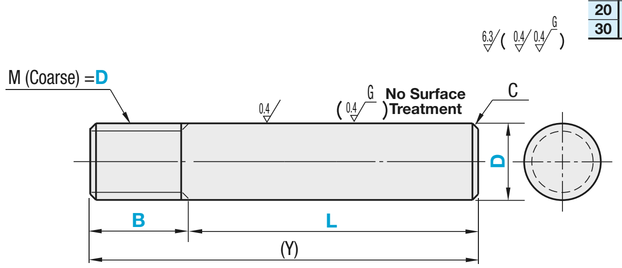
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFAQ	SFUQ	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAQ	SSFUQ	-	EN 1.4125 Equiv.		
PSFAQ	PSFUQ	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAQ	PSSFUQ	-	EN 1.4125 Equiv.		
RSFAQ	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGQ	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGQ	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
3	-0.002 -0.008	0 -0.004	-
4	-0.004 -0.012	0 -0.005	
5			
6			-0.010 -0.028
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
16			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
30			



L does not include incomplete threads.

Part Number		1mm Increment		M	(Y) Max.	C
Type	D	L	B			
(D Tolerance g6) SFAQ, SSFAQ, PSFAQ, PSSFAQ, RSFAQ (L≤500) (D Tolerance h5) SFUQ, SSFUQ, PSFUQ, PSSFUQ (D Tolerance f8) PSFGQ, PSSFGQ	3	25~197	3~15	3	200	0.2 or Less
	4	25~296	4~20	4	300	
	5	25~396	4~25	5	400	
	6	25~595	5~30	6	600	0.5 or Less
	8	25~793	7~40	8	800	
	10	25~792	8~50	10	800	
	12	25~991	9~60	12	1000	
	16	25~1190	10~80	16	1200	
	20	25~1187	13~100	20	1200	1.0 or Less
	30	25~1482	18~150	30	1500	

Coarse Thread Dimension	
M	pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
30	3.5

L dimension has priority, thus B dimensions should be B-(Pitchx2).

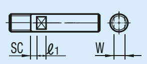
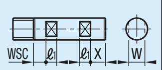
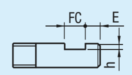
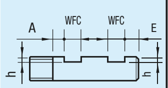
Ordering Example

Part Number	-	L	-	B
SFAQ12	-	500	-	B20
RSFAQ8	-	500	-	B15

Alterations

Part Number	-	L	-	B	-	(SC···etc.)
SFAQ12	-	500	-	B20	-	SC10

Alteration Details P.113

Alterations	Code	Spec.
	SC	Wrench Flats at One Location Ordering Code SC5 Application Notes Applicable to D=6 or more SC=1mm Increment SC+ℓ1≤L SC=0 or SC≥2 Not available in combination with WSC.
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 Application Notes Applicable to D=6 or more WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)=0 or WSC(X)≥2 Orientation between wrench flats is not coplanar. Not available in combination with SC.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC10-A8-E20 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.

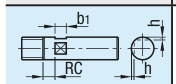
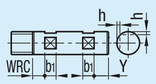
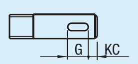
D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	
25	22	
30	27	15

FC:

D	h
3~ 5	0.5
6~18	1
20~30	2

WFC:

D	h
3~ 5	0.5
6~18	1
20~30	2

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	KC	Keyway is added at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20 and 30.

For details, see Shaft Alteration Overview. P.113

Please see Shaft Alteration Overview for details if provided. P.113

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.

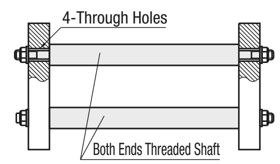
Alterations may lower hardness. See P.112

Part Number		Unit Price																								
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1482
SFAQ SFUQ	3					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	16																							-	-	-
	20																							-	-	-
	30																									
SSFAQ SSFUQ	3					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	16																							-	-	-
	20																							-	-	-
	30																									
PSFAQ PSFUQ	3					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	16																							-	-	-
	20																							-	-	-
	30																									
PSSFAQ PSSFUQ	3					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	16																							-	-	-
	20																							-	-	-
	30																									

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1482
PSFGQ	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12							-	-
	16								-
	20								-
	30								
PSSFGQ	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12							-	-
	16								-
	20								-
	30								

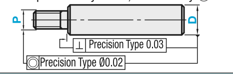
Part Number		Unit Price						
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAQ	3					-	-	-
	4						-	-
	5							-
	6							
	8							
	10							
	12							
	16							
	20							
	30							

Example



Shafts
One End Threaded

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02

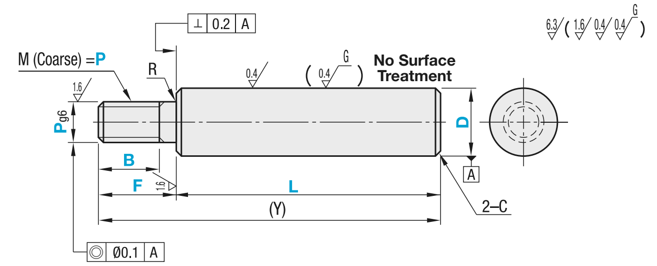


P.211

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.211.
■For One End Threaded with O.D. same as Shaft O.D., see P.161. ■For Shafts with Wrench Flats and Cross-Drilled Hole, see P.165.

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).
Features of LTBC Plating P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Type			M Material	H Hardness	S Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFAN	SFUN	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAN	SSFUN	-	EN 1.4125 Equiv.		
PSFAN	PSFUN	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAN	PSSFUN	-	EN 1.4125 Equiv.		
RSFAN	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGN	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGN	EN 1.4301 Equiv.		



D	D Tol. g6	h5	f8
4	-0.004 -0.012	0 -0.005	-
5			
6			-0.010 -0.028
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

For O.D. tolerance f8 type, D needs to be 6 or more.

Part Number Type	D	1mm Increment L	F	B	P Selection	(Y) Max.	R	C
(D Tolerance g6) SFAN, SSFAN, PSFAN, PSSFAN, RSFAN (D≤30, L≤500) (D Tolerance h5) SFUN, SSFUN, PSFUN, PSSFUN (D Tolerance f8) PSFGN (D≥6), PSSFGN (D≥6)	4	25~ 298	2≤F≤Px5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 B≥Pitchx3	3	300	0.2 or Less	0.2 or Less
	5	25~ 398			3 4	400		
	6	25~ 598			3 4 5	600	0.3 or Less	0.5 or Less
	8	25~ 798			3 4 5 6	800		
	10	25~ 798			4 5 6 8	800		
	12	25~ 998			5 6 8 10	1000		
	13	25~ 998			5 6 8 10 12	1000		
	15	25~ 998			5 6 8 10 12	1000		
	16	25~1198			5 6 8 10 12	1200		
	18	25~1198			5 6 8 10 12 16	1200		
	20	25~1198			6 8 10 12 16	1200		1.0 or Less
	25	25~1198			8 10 12 16 20 24	1200		
	30	25~1498			8 10 12 16 20 24	1500		
	35	25~1498			10 12 16 20 24 30	1500	0.5 or Less	
	40	25~1498			12 16 20 24 30	1500		
	50	25~1498			16 20 24 30	1500		

Coarse Thread Dimension

M	pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

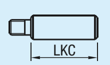
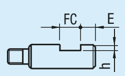
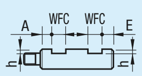
Ordering Example

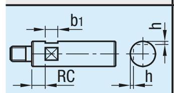
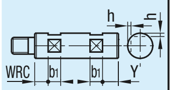
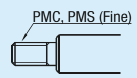
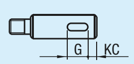
Part Number	-	L	-	F	-	B	-	P
SFAN12	-	500	-	F20	-	B15	-	P6
SFUN8	-	150	-	F20	-	B15	-	P6

Alterations

Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	(LKC···etc.)
SFAN30	-	250	-	F40	-	B30	-	P10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1 Not applicable when D-P≤2.
 FC E	FC	Set Screw Flat at One Location Ordering Code FC10-E8 Application Notes FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D: 4~5 / h: 0.5; D: 6~18 / h: 1; D: 20~40 / h: 2; D: 50 / h: 3
 A WFC WFC E	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 Application Notes WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D: 4~5 / h: 0.5; D: 6~18 / h: 1; D: 20~40 / h: 2; D: 50 / h: 3

Alterations	Code	Spec.	
 b1 RC h	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.	For details, see Shaft Alteration Overview. P.113
 h WRC b1 b1 Y	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.	
 PMC, PMS (Fine)	PMC PMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMSC)	
 G KC	KC	Keyway is added at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.	

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
The distance between wrench flats and cross-drilled holes should be greater than 2mm for alterations.
Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFAN SFUN	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAN SSFUN	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFAN PSFUN	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFAN PSSFUN	4							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

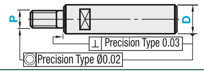
Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L1201 ~ 1498
PSFGN	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGN	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAN	4						-	-
	5							-
	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Shafts

One End Threaded with Wrench Flats / Cross-Drilled Hole

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



P.211

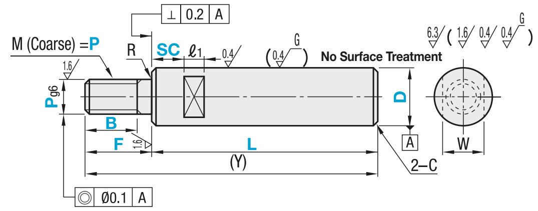
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.211.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.163.

- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

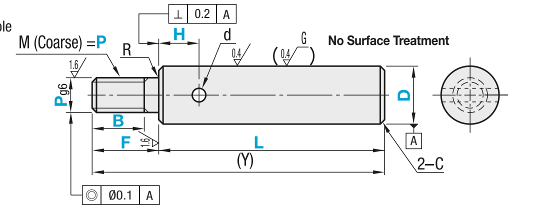
Type: With Wrench Flats D Tol. g6	D Tol. h5	D Tol. f8	With Cross-Drilled Hole D Tol. g6	D Tol. f8	Material	Hardness	Surface Treatment
SFAS	SFUS	-	SFHN	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAS	SSFUS	-	SSFHN	-	EN 1.4125 Equiv.		-
PSFAS	PSFUS	-	PSFHN	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAS	PSSFUS	-	PSSFHN	-	EN 1.4125 Equiv.		
RSFAS	-	-	RSFHN	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGS	-	PSGHN	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSFGS	-	-	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

With Wrench Flats



With Cross-Drilled Hole
(8≤D≤30,L≤500)



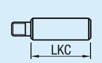
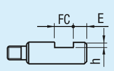
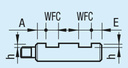
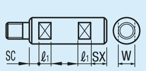
Part Number Type	D	1mm Increment L	F	B	P Selection	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	(Y) Max.	R	C
(With Wrench Flats) (D Tolerance g6) SFAS SSFAS PSFAS PSSFAS RSFAS (D≤30, L≤500) (D Tolerance h5) SFUS SSFUS PSFUS PSSFUS (D Tolerance f8) PSFGS PSSFGS / (With Cross-Drilled Hole) 8≤D≤30,L≤500 (D Tolerance g6) SFHN SSFHN PSFHN PSSFHN RSFHN (D Tolerance f8) PSGHN	6	25~598	2≤F≤Px5	(When P≤6) B≤F-2; (when P=8 or 10) B≤F-3; (When P≥12) B≤F-5; B≥Pitchx3	3 4 5	SC=1mm Increment; SC+ℓ1≤L; SC≥0; Details of Wrench Flats P.112	5	8	-	-	600	0.3 or Less	0.5 or Less
	8	25~798			3 4 5 6		7		H=1mm Increment; L≥H+d/2+2; H≥d/2+2	3	800		
	10	25~798			4 5 6 8		8				800		
	12	25~998			5 6 8 10		10	10			1000		
	13	25~998			5 6 8 10 12		11			4	1000		
	15	25~998			5 6 8 10 12		13				1000		
	16	25~1198			5 6 8 10 12		14				1200		
	18	25~1198			5 6 8 10 12 16		16			6	1200		1.0 or Less
	20	25~1198			6 8 10 12 16		17				1200		
	25	25~1198			8 10 12 16 20 24		22			7	1200		
	30	25~1498			8 10 12 16 20 24		27	15			1500		
	35	25~1498			10 12 16 20 24 30		30		-	-	1500	0.5 or Less	
	40	25~1498			12 16 20 24 30		36	20			1500		
	50	25~1498			16 20 24 30		41				1500		

Coarse Thread Dimension M	pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

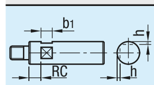
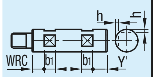
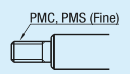
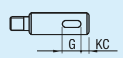
Ordering Example	Part Number	-	L	-	F	-	B	-	P	-	SC	-	H
	SFAS12	-	200	-	F20	-	B15	-	P8	-	SC5		
	SFHN18	-	450	-	F40	-	B25	-	P12			-	H10

Alterations	Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	SC	-	H	-	(LKC···etc.)
	SFAS30	-	250	-	F40	-	B30	-	P10	-	SC10	-		-	LKC

Alteration Details P.113

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance. Ordering Code LKC. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03; 200≤L<500···L±0.05; L≥500 ···L±0.1. Not applicable when D-P≤2.
 FC E	FC	Set Screw Flat at One Location. Ordering Code FC10-E8. Application Notes FC, E=1mm Increment. FC≤3xD. When 1.5xD<FC, FC≤L/2. E=0 or E≥2. Not available in combination with WFC. (D 6~18: h 1; D 20~40: h 2; D 50: h 3)
 A WFC WFC E	WFC	Set Screw Flats at Two Locations. Ordering Code WFC8-A8-E4. Application Notes WFC, A, E=1mm Increment. WFC≤3xD. When 1.5xD<WFC, 2WFC≤L/2. A(E)=0 or A(E)≥2. Orientation between set screw flats is not coplanar. Not available in combination with FC. (D 6~18: h 1; D 20~40: h 2; D 50: h 3)
 SC ℓ1 ℓ1 SX W	SX	Second Set of Wrench Flats. Ordering Code SX15. Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment. SC+SX+ℓ1x2<L. SX≥0. Orientation between two set screw flats is not coplanar.

D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8		25	22	
12	10	10	30	27	15
13	11		35	30	
15	13		40	36	20
16	14		50	41	

Alterations	Code	Spec.	
 b1 RC h	RC	90-deg. Set Screw Flat at One Location. Ordering Code RC10. Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.	For details, see Shaft Alteration Overview. P.113
 WRC b1 b1 Y h	WRC	90-deg. Set Screw Flats at Two Locations. Ordering Code WRC10-Y10. Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.	
 PMC, PMS (Fine)	PMC PMS	Change to Fine Thread. Ordering Code PMC14 (P is changed to PMC.) PMS14 (P is changed to PMSC)	
 G KC	KC	Keyway is added at one location. Ordering Code KC10-G10. Application Notes Only applicable to D=12, 16, 20, 25 and 30.	

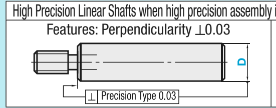
- Please see Alteration Overview for details. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
- The distance between wrench flats and cross-drilled holes should be greater than 2mm for alterations.
- Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFAS SFUS SFHN	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAS SSFUS SSFHN	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSFAS PSFUS PSFHN	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSFAS PSSFUS PSSFHN	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
PSFGS PSGHN	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGS	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSFAS RSFHN	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

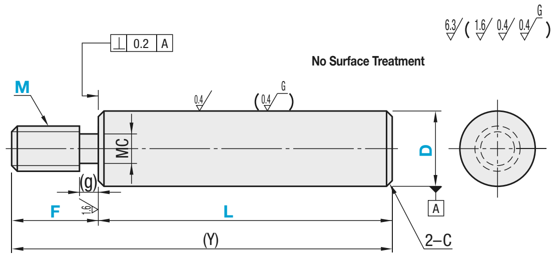
Shafts
One End Threaded with Undercut



■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.213.
■For Shafts With Wrench Flats, see P.169.

Type D Tol. g6	Type D Tol. h5	Type D Tol. f8	Material	Hardness	Surface Treatment
SAFN	SFNU	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSAFN	SSFNU	-	EN 1.4125 Equiv.		-
PSAFN	PSFNU	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSAFN	PSSFNU	-	EN 1.4125 Equiv.		
RSAFN	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSAGN	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSAGN	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064



Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

Part Number Type	D	1mm Increment L	F	Selection M (Coarse)	(Y) Max.	C
(D Tolerance g6) SAFN, SSAFN, PSAFN, PSSAFN, RSAFN (D≤30,L≤500) (D Tolerance h5) SFNU, SSFNU, PSFNU, PSSFNU (D Tol. f8) PSAGN, PSSAGN	8	25~795	5≤F≤Mx3 F-(g)≥Pitchx3	6	800	0.5 or Less
	10	25~795		6 8	800	
	12	25~995		6 8 10	1000	
	13	25~995		6 8 10 12	1000	
	15	25~995		6 8 10 12	1000	
	16	25~1195		6 8 10 12	1200	
	18	25~1195		6 8 10 12 16	1200	
	20	25~1195		6 8 10 12 16	1200	1.0 or Less
	25	25~1195		8 10 12 16 20 24	1200	
	30	25~1495		8 10 12 16 20 24	1500	
	35	25~1495		10 12 16 20 24 30	1500	
	40	25~1495		12 16 20 24 30	1500	
	50	25~1495		16 20 24 30	1500	

Coarse Thread Undercut Dimension

M	Pitch	MC	(g)
6	1.0	4.4	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

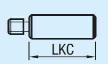
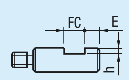
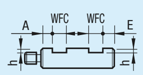
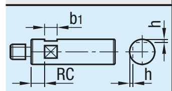
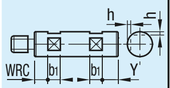
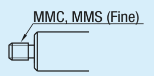
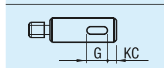
Ordering Example

Part Number	-	L	-	F	-	M
SAFN13	-	200	-	F20	-	M10
SFNU13	-	800	-	F23	-	M10

Alterations

Part Number	-	L	-	F	-	M (MMC, MMS)	-	(LKC···etc.)
SAFN30	-	250	-	F20	-	M10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes L dimensions can be specified in 0.1mm increment for LKC. L<200 ···→L±0.03 200≤L<500 ···→L±0.05 L≥500 ···→L±0.1 Not applicable when D-M≤2.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D: 8~18 h: 1; D: 20~40 h: 2; D: 50 h: 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D: 8~18 h: 1; D: 20~40 h: 2; D: 50 h: 3
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	MMC MMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MSC)
	KC	Add keyway at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.

For details, see Shaft Alteration Overview. P.113

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1495
SAFN SFNU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSAFN SSFNU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSAFN PSFNU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSAFN PSSFNU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

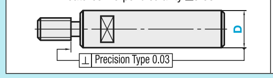
Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1495
PSAGN	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSAGN	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSAFN	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Shafts

One End Threaded with Undercut and Wrench Flats / Cross-Drilled Hole

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03



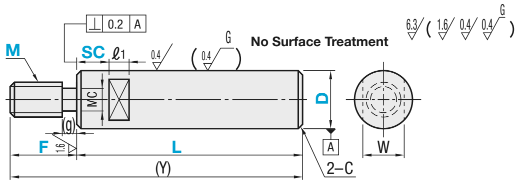
P.213

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.213.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.167.

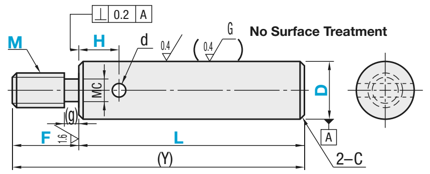
Type					Material	Hardness	Surface Treatment
With Wrench Flats			With Cross-Drilled Hole				
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
SAFS	SFSU	-	SFHS	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSAFS	SSFSU	-	SSHFS	-	EN 1.4125 Equiv.		
PSAFS	PSFSU	-	PSHFS	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSAFS	PSSFSU	-	PSSHFS	-	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	
RSAFS	-	-	RSHFS	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSAGS	-	PSHGS	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSSAGS	-	-	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
8, 10	-0.005 / -0.014	0 / -0.006	-0.013 / -0.035
12, 13, 15, 16, 18	-0.006 / -0.017	0 / -0.008	-0.016 / -0.043
20, 25, 30	-0.007 / -0.020	0 / -0.009	-0.020 / -0.053
35, 40, 50	-0.009 / -0.025	0 / -0.011	-0.025 / -0.064

With Wrench Flats



With Cross-Drilled Hole
(D≤30, L≤500)



- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

Part Number Type			D	1mm Increment L	F	Selection M (Coarse)	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	(Y) Max.	C
(With Wrench Flats) (D Tolerance g6) SAFS SSAFS PSAFS PSSAFS RSAFS(D≤30,L≤500)	(D Tolerance h5) SFSU SSFSU PSFSU PSSFSU	(With Cross-Drilled Hole) D≤30, L≤500 (D Tolerance g6) SFHS SSHFS PSHFS PSSHFS RSHFS	8	25~795	5≤F≤Mx3	6	SC=1mm Increment; SC+ℓ1≤L; SC≥0; Details of Wrench Flats P.112	7	8	H=1mm Increment; L≥H+d/2+2; H≥d/2+2	3	800	0.5 or Less
			10	25~795		6 8		8				800	
			12	25~995		6 8 10		10	10			1000	
			13	25~995		6 8 10 12		11			4	1000	
			15	25~995		6 8 10 12		13				1000	
			16	25~1195		6 8 10 12		14				1200	
			18	25~1195		6 8 10 12 16		16			6	1200	
			20	25~1195		6 8 10 12 16		17				1200	
(D Tolerance f8) PSAGS PSSAGS		(D Tolerance f8) PSHGS	25	25~1195		8 10 12 16 20 24		22			7	1200	1.0 or Less
			30	25~1495		8 10 12 16 20 24		27	15			1500	
			35	25~1495		10 12 16 20 24 30		30			-	1500	
			40	25~1495		12 16 20 24 30		36	20			1500	
			50	25~1495	F-(g)≥Pitchx3	16 20 24 30		41				1500	

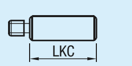
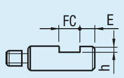
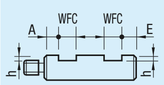
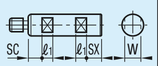
Ordering Example

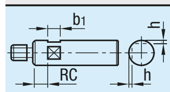
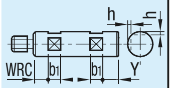
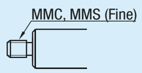
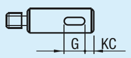
Part Number	-	L	-	F	-	M	-	SC	-	H
SAFS13	-	800	-	F23	-	M10				
SSHFS20	-	450	-	F28	-	M12			-	H15

Alterations

Part Number	-	L	-	F	-	M (MMC, MMS)	-	SC	-	H	-	(LKC···etc.)
SAFS30	-	250	-	F20	-	M10	-	SC20	-		-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 ····L±0.03 200≤L<500···L±0.05 L≥500 ····L±0.1 Not applicable when D-M≤2.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D 8~18: h 1; D 20~40: h 2; D 50: h 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D 8~18: h 1; D 20~40: h 2; D 50: h 3
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D/W/ℓ1: 8/7/8, 10/8/8, 12/10/10, 13/11/10, 15/13/10, 16/14/10, 18/16/10, 20/17/10, 25/22/10, 30/27/15, 35/30/15, 40/36/20, 50/41/20

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC. For details, see Shaft Alteration Overview. P.113
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	MMC MMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS)
	KC	Keyway is added at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
- Alterations may lower hardness. See P.112

Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300	L301~350	L351~400	L401~450	L451~500	L501~550	L551~600	L601~650	L651~700	L701~750	L751~800	L801~850	L851~900	L901~950	L951~1000	L1001~1100	L1101~1200	L1201~1300	L1301~1400	L1401~1495
SAFS SFSU SFHS	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSAFS SSFSU SSHFS	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSAFS PSFSU PSHFS	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
PSSAFS PSSFSU PSSHFS	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

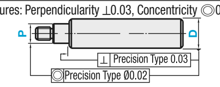
Type	D	Min. L~100	L101~200	L201~400	L401~600	L601~800	L801~1000	L1001~1200	L1201~1495
PSAGS PSHGS	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSAGS	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
RSAFS RSHFS	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Shafts

One End Stepped and Threaded / Both Ends Stepped and Threaded

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



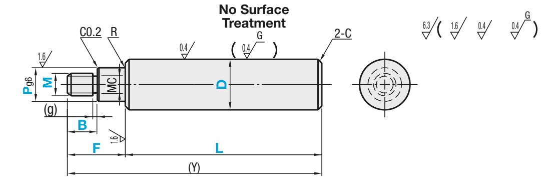
P.205

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.205.

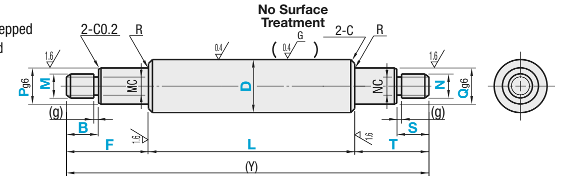
Type						Material	Hardness	Surface Treatment
One End Stepped and Threaded			Both Ends Stepped and Threaded					
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. h5	D Tol. f8			
SFAF	SFUF	-	SFAX	SFUX	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAF	SSFUF	-	SSFAX	SSFUX	-	EN 1.4125 Equiv.		
PSFAF	PSFUF	-	PSFAX	PSFUX	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFAF	PSSFUF	-	PSSFAX	PSSFUX	-	EN 1.4125 Equiv.		
RSFAF	-	-	RSFAX	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGF	-	-	PSFGX	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More ~
-	-	PSSFGF	-	-	PSSFGX	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

One End Stepped and Threaded



Both Ends Stepped and Threaded



Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

Part Number Type	D	1mm Increment L	F, T	B, S	P, Q	M (Coarse), N (Coarse) Selection	(Y) Max.	R	C
One End Stepped and Threaded (D Tolerance g6): SFAF, SSFAF, PSFAF, PSSFAF, RSFAF (D≤30, L≤500); (D Tolerance h5): SFUF, SSFUF, PSFUF, PSSFUF; (D Tolerance f8): PSFGF, PSSFGF. Both Ends Stepped and Threaded (D Tolerance g6): SFAX, SSFAX, PSFAX, PSSFAX, RSFAX (D≤30,L≤500); (D Tolerance h5): SFUX, SSFUX, PSFUX, PSSFUX; (D Tolerance f8): PSFGX, PSSFGX. * For RSFAF and RSFAX, L≤500 and Ymax≤800.	8	25~790	10≤F≤Px5 10≤T≤Qx5	Pitchx3+(g)≤B≤Mx3 Pitchx3+(g)≤S≤Nx3	M<P<D N<Q<D	6	800	0.3 or Less	0.5 or Less
	10	25~790				6 8	800		
	12	25~990				6 8 10	1000		
	13	25~990				6 8 10	1000		
	15	25~990				6 8 10 12	1000		
	16	25~1190				6 8 10 12	1200		
	18	25~1190				6 8 10 12 16	1200		
	20	25~1190				6 8 10 12 16	1200		1.0 or Less
	25	25~1190				8 10 12 16 20	1200		
	30	25~1490				8 10 12 16 20 24	1500		
	35	25~1480	20≤F≤Px5 20≤T≤Qx5			10 12 16 20 24 30	1500	0.5 or Less	
	40	25~1480				12 16 20 24 30	1500		
	50	25~1480				16 20 24 30	1500		

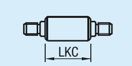
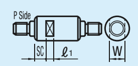
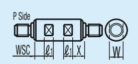
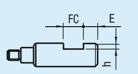
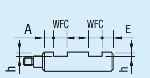
Coarse Thread Undercut Dimension			
M N	Pitch	MC NC	(g)
6	1.0	4.4	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

F-B(T-S)≥2 is required.

Ordering Example	Part Number	-	L	-	F	-	B	-	P	-	M	-	T	-	S	-	Q	-	N
	SFAX20	-	400	-	F30	-	B20	-	P10	-	M8	-	T20	-	S15	-	Q10	-	N8

Alterations	Part Number	-	L	-	F	-	B	-	P	-	M (MMC, MMS)	-	T	-	S	-	Q	-	N (NMC, NMS)	-	(LKC···etc.)
	SFAX30	-	300	-	F40	-	B30	-	P20	-	M16	-	T50	-	S30	-	Q16	-	N10	-	LKC

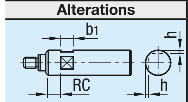
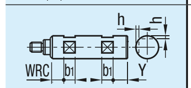
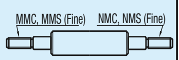
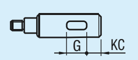
Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P(Q)≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500···L±0.05 L≥500 ···L±0.1
	SC	Wrench Flats at One Location Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0 Not available in combination with WSC.
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between wrench flats is not coplanar. Not available in combination with SC. Not applicable to One End Stepped and Threaded.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. Not applicable to Both Ends Stepped and Threaded.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC10-A8-E20 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. Not applicable to Both Ends Stepped and Threaded.

D	W	ℓ1
8	7	8
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

D	h
8~18	1
20~40	2
50	3

D	h
8~18	1
20~40	2
50	3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	MMC MMS NMC NMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS) NMC14 (N is changed to NMC) NMS14 (N is changed to NMS)
	KC	Keyway is added at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30. Not applicable to Both Ends Stepped and Threaded.

For details, see Shaft Alteration Overview. P.113

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Undercut Dimensions for Fine Threads①			
MMC NMC	Pitch	MC NC	(g)
6	0.75	4.8	2
8	1.0	6.4	
10		8.4	
12		10.4	
15		13.4	
17		15.4	
20		18.4	
25	1.5	22.7	3
30		27.7	

Undercut Dimensions for Fine Threads②			
MMS NMS	Pitch	MC NC	(g)
10	1.25	8	3
12	1.5	9.7	
14		11.7	
18		15.7	

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1480
SFAF / SFUF	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
SSFAF / SSFUF	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1480
PSFAF / PSFUF	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
PSSFAF / PSSFUF	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

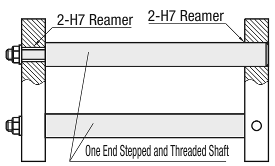
Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1480
SFAX / SFUX	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
SSFAX / SSFUX	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

Part Number Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1480
PSFAX / PSFUX	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
PSSFAX / PSSFUX	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1490
PSFGF	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGF	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1490
PSFGX	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGX	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Example



Part Number Type	D	Min. L ~ 50	L51 ~100	L101 ~150	L151 ~200	L201 ~300	L301 ~400	L401 ~500
RSFAF	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Part Number Type	D	Min. L ~ 50	L51 ~100	L101 ~150	L151 ~200	L201 ~300	L301 ~400	L401 ~500
RSFAX	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Shafts

One End Stepped and Tapped, One End Threaded / One End Stepped, One End Threaded

RoHS

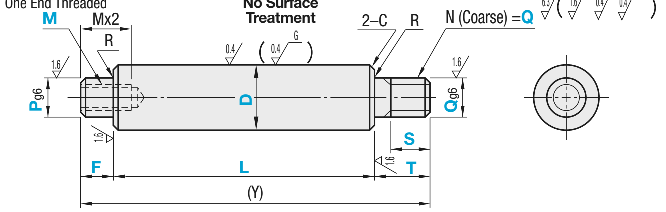
Shaft End Machined Area (Effective Thread Length + Approx. 10mm) Annealing may lower hardness.

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

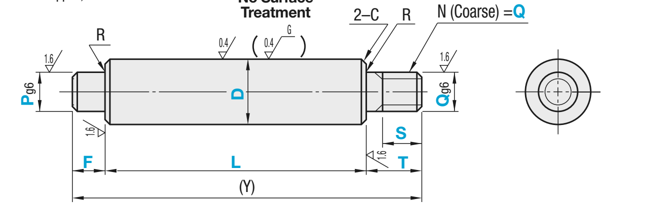
Features of LTBC Plating P.128

Type: One End Stepped and Tapped One End Threaded D Tol. g6	D Tol. h5	D Tol. f8	Type: One End Stepped, One End Threaded D Tol. g6	D Tol. h5	D Tol. f8	M Material	H Hardness	S Surface Treatment
SFAB	SFUA	-	SFNB	SFUB	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAB	SSFUA	-	SSFNB	SSFUB	-	EN 1.4125 Equiv.		-
PSFAB	PSFUA	-	PSFNB	PSFUB	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFAB	PSSFUA	-	PSSFNB	PSSFUB	-	EN 1.4125 Equiv.		
RSFAB	-	-	RSFNB	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGB	-	-	PSNGB	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More ~
-	-	PSSFGB	-	-	PSSNGB	EN 1.4301 Equiv.		

One End Stepped and Tapped One End Threaded



One End Stepped, One End Threaded



D	D Tol. g6	D Tol. h5	D Tol. f8
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

Coarse Thread Dimension

M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

Part Number Type	D	L (1mm Increment)	F (1mm Increment)	T (1mm Increment)	S (1mm Increment)	P (1mm Increment)	M (Coarse) Selection	Q Selection	(Y) Max.	R	C
One End Stepped and Tapped One End Threaded (D Tolerance g6) SFAB, SSFAB, PSFAB, PSSFAB, RSFAB (D Tolerance h5) SFUA, SSFUA, PSFUA, PSSFUA (D≤30,L≤500,Ymax≤800) (D Tolerance f8) PSFGB, PSSFGB One End Stepped, One End Threaded (D Tolerance g6) SFNB, SSFNB, PSFNB, PSSFNB, RSFNB (D Tolerance h5) SFUB, SSFUB, PSFUB, PSSFUB (D≤30,L≤500,Ymax≤800) (D Tolerance f8) PSNGB, PSSNGB	8	25~ 796	2≤F≤Px4	2≤T≤Qx5	(When Q≤6) S≤T-2 (When Q=8, 10) S≤T-3 (When Q≥12) S≤T-5 (W/o Threads) S=0 S=0 is only applicable to One End Stepped and Tapped One End Threaded. S≥Pitchx3	6	3	3 4 5 6 8	800	0.3 or Less	0.5 or Less
	10	25~ 796				6~8	3 4 5	4 5 6 8 10	800		
	12	25~ 996				6~10	3 4 5 6	5 6 8 10 12	1000		
	13	25~ 996				6~11	3 4 5 6 8	5 6 8 10 12	1000		
	15	25~ 996				6~13	3 4 5 6 8 10	5 6 8 10 12	1000		
	16	25~1196				6~14	3 4 5 6 8 10	5 6 8 10 12 16	1200		
	18	25~1196				8~16	4 5 6 8 10 12	5 6 8 10 12 16	1200		
	20	25~1196				8~17	4 5 6 8 10 12	6 8 10 12 16 20	1200		1.0 or Less
	25	25~1196				8~22	4 5 6 8 10 12 16	8 10 12 16 20 24	1200		
	30	25~1496				9~27	5 6 8 10 12 16 20 24	8 10 12 16 20 24 30	1500		
	35	25~1496				9~32	5 6 8 10 12 16 20 24	10 12 16 20 24 30	1500	0.5 or Less	
	40	25~1496				11~37	6 8 10 12 16 20 24 30	12 16 20 24 30	1500		
	50	25~1496				11~47	6 8 10 12 16 20 24 30	16 20 24 30	1500		

P dimensions require M+3≤P. L+F dimensions require Mx4 or more.
When D=Q, specify T=S as S dimensions. However, L and T dimensions have manufacturing priority and S dimension will be T-(Pitchx2).

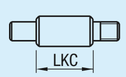
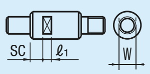
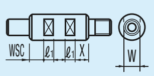
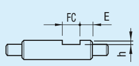
Ordering Example

Part Number	L	F	P	M	T	S	Q
SFNB20	400	F25	P16		T35	S25	Q16
SFAB20	400	F25	P16	M10	T35	S25	Q16

Alterations

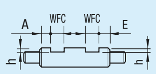
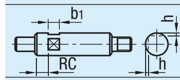
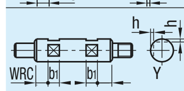
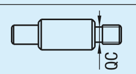
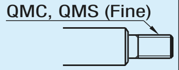
Part Number	L	F	P	M	T	S	Q(QMC·QMS)	(LKC···etc.)
SFAB20	400	F25	P16	M10	T35	S25	Q16	LKC-QC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P(Q)≤2. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···→L±0.03 200≤L<500 ···→L±0.05 L≥500 ···→L±0.1
	SC	Wrench Flats at One Location Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0 Not available in combination with WSC.
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between wrench flats is not coplanar. Not available in combination with SC.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC.

D	W	ℓ1
8	7	8
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

D	h
8~18	1
20~40	2
50	3

Alterations	Code	Spec.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC10-A8-E20 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	QC	Undercut Ordering Code QC Application Notes Applicable to M=6 or more. Not Applicable to D=Q.
QMC, QMS (Fine) 	QMC QMS	Change to Fine Thread Ordering Code QMC14 (Q is changed to QMC) QMS14 (Q is changed to QMS)

D	h
8~18	1
20~40	2
50	3

For details, see Shaft Alteration Overview. P.113

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness.See P.112

Part Number Type	D	Unit Price Min. L 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1496
SFAB SFUA	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
SSFAB SSFUA	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

Part Number Type	D	Unit Price Min. L 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1496
PSFAB PSFUA	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
PSSFAB PSSFUA	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

Part Number Type	D	Unit Price Min. L 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1496
SFNB SFUB	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
SSFNB SSFUB	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

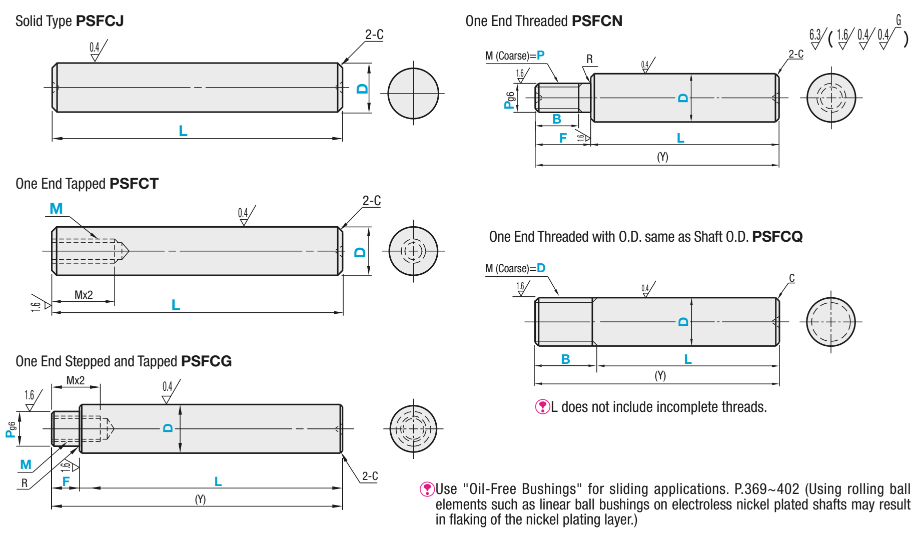
Part Number Type	D	Unit Price Min. L 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1496
PSFNB PSFUB	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
PSSFNB PSSFUB	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15											-	-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

Part Number Type	D	Unit Price Min. L ~100	L101~200	L201~400	L401~600	L601~800	L801~1000	L1001~1200	L1201~1496
PSFGB PSNGB	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGB PSSNGB	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Unit Price Min. L ~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
RSFAB RSFNB	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Surface treatment is also applied to shaft ends.

Type					D Tol.	M Material	H Hardness	S Surface Treatment
Solid	One End Tapped	One End Stepped and Tapped	One End Threaded	One End Threaded with O.D. same as Shaft O.D.				
PSFCJ	PSFCT	PSFCG	PSFCN	PSFCQ	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 58HRC~	Electroless Nickel Plating



L does not include incomplete threads.

- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).
- Shafts may have centering holes at end faces depending on shapes.

Use "Oil-Free Bushings" for sliding applications. P.369~402 (Using rolling ball elements such as linear ball bushings on electroless nickel plated shafts may result in flaking of the nickel plating layer.)

■Solid Type, One End Tapped Type, One End Stepped and Tapped Type

Part Number		1mm Increment				Selection		(Y) Max.	R	C
Type	D	L (Solid / One End Tapped)	L (One End Stepped and Tapped)	F	P	M (One End Tapped)	M (One End Stepped and Tapped)			
Solid Type PSFCJ One End Tapped PSFCT One End Stepped and Tapped PSFCG	8	20~ 800	25~798	2≤F≤Px4	6	3 4 5	3	800	0.3 or Less	0.5 or Less
	10	20~ 800	25~798		6~ 8	3 4 5 6	3 4 5	800		
	12	20~1000	25~998		6~10	4 5 6 8	3 4 5 6	1000		
	15	25~1000	25~998		6~13	4 5 6 8 10	3 4 5 6 8 10	1000		
	20	30~1000	25~998		6~17	4 5 6 8 10 12	4 5 6 8 10 12	1000		1.0 or Less
	25	35~1000	25~998		8~22	4 5 6 8 10 12 16	4 5 6 8 10 12 16	1000		
	30	35~1000	25~998		9~27	6 8 10 12 16 20	5 6 8 10 12 16 20	1000		
	35	35~1000	25~998		9~32	8 10 12 16 20 24	5 6 8 10 12 16 20 24	1000	0.5 or Less	
	40	50~1000	25~998		11~37	10 12 16 20 24 30	6 8 10 12 16 20 24 30	1000		
	50	65~1000	25~998		11~47	12 16 20 24 30	6 8 10 12 16 20 24 30	1000		

• One End Tapped Type When Mx2.5+4≥L, tap pilot holes may go through. • One End Stepped and Tapped P≥M+3 When Mx2.5+4≥Y, tap pilot holes may go through.

■One End Threaded

Part Number		1mm Increment			P Selection	(Y) Max.	R	C
Type	D	L	F	B				
One End Threaded PSFCN	8	25~798	2≤F≤Px5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (P≥12) B≤F-5 B≥Pitchx3	3 4 5 6	800	0.3 or Less	0.5 or Less
	10	25~798			4 5 6 8	800		
	12	25~998			5 6 8 10	1000		
	15	25~998			5 6 8 10 12	1000		1.0 or Less
	20	25~998			6 8 10 12 16	1000		
	25	25~998			8 10 12 16 20 24	1000		
	30	25~998			8 10 12 16 20 24	1000		
	35	25~998			10 12 16 20 24 30	1000	0.5 or Less	
	40	25~998			12 16 20 24 30	1000		
	50	25~998			16 20 24 30	1000		

Coarse Thread Dimension	
M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

■One End Threaded with O.D. same as Shaft O.D.

Part Number		1mm Increment		M	(Y) Max.	R	C
Type	D	L	B				
One End Threaded with O.D. same as Shaft O.D. PSFCQ	8	25~793	7~40	8	800	0.3 or Less	0.5 or Less
	10	25~795	8~50	10	800		
	12	25~991	9~60	12	1000		
	20	25~987	13~100	20	1000		1.0 or Less
	30	25~982	18~150	30	1000		

For shafts with O.D. same as Shaft O.D., L dimension has priority, thus the effective thread length will be B-(Pitchx2).

Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	M
PSFCJ20	-	75								
PSFCT20	-	525							-	M8
PSFCG20	-	400	-	F25			-	P16	-	M10
PSFCN20	-	950	-	F50	-	B30	-	P10		
PSFCQ12	-	500			-	B20				

■Solid Type

Part Number		Unit Price									
Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000
PSFCJ	8										-
	10										-
	12										
	15										
	20										
	25										
	30										
	35										
	40										
	50	-									

■One End Threaded

Part Number		Unit Price									
Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~998
PSFCN	8										-
	10										-
	12										
	15										
	20										
	25										
	30										
	35										
	40										
	50	-									

■One End Tapped Type

Part Number		Unit Price									
Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000
PSFCT	8										-
	10										-
	12										
	15										
	20										
	25										
	30										
	35										
	40										
	50	-									

■One End Threaded with O.D. same as Shaft O.D.

Part Number		Unit Price									
Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~991
PSFCQ	8										-
	10										-
	12										
	20										
	30										

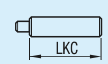
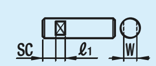
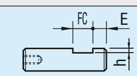
■One End Stepped and Tapped Type

Part Number		Unit Price									
Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000
PSFCG	8										-
	10										-
	12										
	15										
	20										
	25										
	30										
	35										
	40										
	50	-									

Alterations Part Number - L - F - B - P (PMC, PMS) - M (MSC) - (LKC···etc.)
PSFCN30 - 250 - F40 - B30 - P10 - LKC

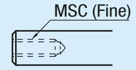
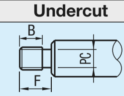
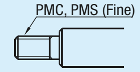
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114

Surface treatment will be also applied to altered areas.
Alterations may lower hardness. See P.112

Alterations	Alteration to L dimension tolerance	Wrench Flats	Set Screw Flat
			
Code	LKC	SC	FC
Spec.	Changes L tolerance. Ordering Code LKC L<200···L±0.03 200≤L<500···L±0.05 L≥500···L±0.1 L dimensions can be specified in 0.1mm increment for LKC. Not applicable to One End Threaded Type when D-P≤2. Not applicable to One End Threaded with O.D. same as Shaft O.D.	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0	Adds a screw flat. Ordering Code FC10-E8 FC, E=1mm Increment FC≤Dx3 When 1.5xD<FC, FC≤L/2 E=0 or E≥2

D	W	ℓ1
8	7	8
10	8	
12	10	10
15	13	
20	17	
25	22	10
30	27	15
35	30	
40	36	20
50	41	

D	h
8~15	1
20~40	2
50	3

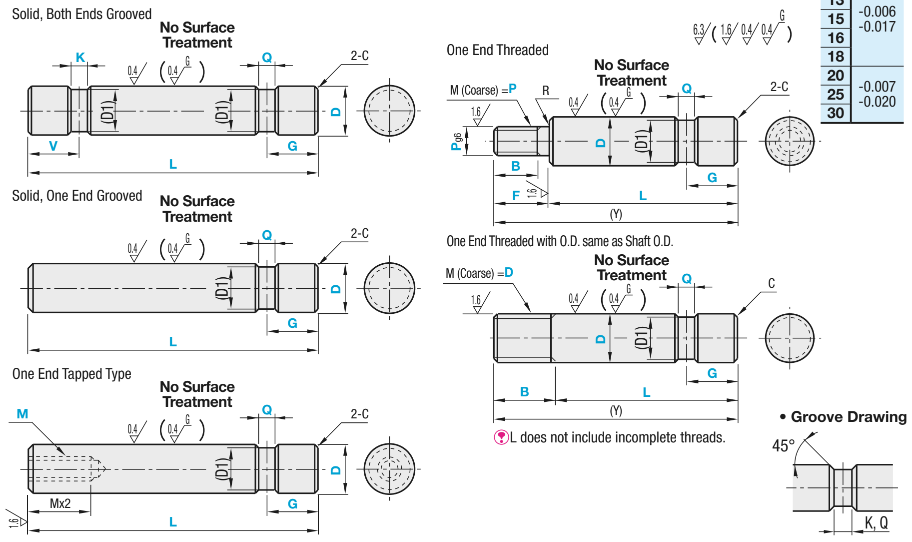
Alterations	Fine Tap	Undercut	Fine Thread
			
Code	MSC	PC	PMC, PMS
Spec.	Changes tapped threads to fine tapped threads shown in the table below. Ordering Code MSC14 Applicable to One End Tapped Type and One End Stepped and Tapped Type. Specify in reference to D dimensions for One End Threaded Shafts; P dimensions for One End Stepped and Tapped Shafts. Specify M dimensions with MSC. M dimension is equal to MSC.	Adds an undercut to P. Ordering Code PC For detailed undercut dimensions, see P.111. Applicable to One End Threaded Type only. Not applicable to M3~M5.	Changes the threads to fine threads shown in the table below. (PMC→Applicable to bearing nut fine thread pitches.) (PMS→Applicable to cylinder fine thread pitches.) Ordering Code PMC17 Applicable to One End Threaded Type only. Specify P dimensions with PMC (PMS). P dimension is equal to that of PMC(PMS).

D, P	MSC				
12	8				
15	8	10			
20	8	10	12	14	
25~35	8	10	12	14	18
40		10	12	14	18
50			12	14	18
Pitch	1.0	1.25	1.5		

D	PMC	PMS
8	3 4 5 6	
10	4 5 6 8	
12	5 6 8 10	10
15	5 6 8 10 12	10 12
20	6 8 10 12 15 17	10 12 14 18
25	8 10 12 15 17 20	10 12 14 18
30	8 10 12 15 17 20 25	10 12 14 18
35	10 12 15 17 20 25 30	10 12 14 18
40	12 15 17 20 25 30	12 14 18
50	15 17 20 25 30	14 18
Pitch	0.35 0.5 0.75 1.0 1.5	1.25 1.5

Type					Ⓜ Material	Ⓗ Hardness	Ⓢ Surface Treatment
Solid, Both Ends Grooved	Solid, One End Grooved	One End Tapped	One End Threaded	One End Threaded with O.D. same as Shaft O.D.			
SFJQ	SFJS	SFTS	SFNS	SFQS	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFJQ	SSFJS	SSFTS	SSFNS	SSFQS	EN 1.4125 Equiv.		
PSFJQ	PSFJS	PSFTS	PSFNS	PSFQS	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFJQ	PSSFJS	PSSFTS	PSSFNS	PSSFQS	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	

D Tol.	
D	g6
6	-0.004 -0.012
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	



Annealing could reduce hardness at set screw grooved shaft end machined areas (effective thread length + approx. 10mm).

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

L does not include incomplete threads.

Solid, One End Tapped

Part Number Type	D	L specified in 1mm Increment	One End Tapped Selection M (Coarse)	Slot Dimension V, G (0.1mm Increment)	K, Q (Selection)	D1	C
Solid, Both Ends Grooved SFJQ SSFJQ PSFJQ PSSFJQ Solid, One End Grooved SFJS SSFJS PSFJS PSSFJS One End Tapped Type SFTS SSFTS PSFTS PSSFTS	6	20~600	3	5~18	4	5	
	8	20~800	3 4 5	5~24	4 5	7	
	10	20~800	3 4 5 6	5~30	4 5	9	
	12	20~1000	4 5 6 8	5~36	5	10	0.5 or Less
	13	25~1000	4 5 6 8	5~39	5	11	
	15	25~1000	4 5 6 8 10	5~45	5 6	13	
	16	30~1200	4 5 6 8 10	5~48	5 6	14	
	18	30~1200	4 5 6 8 10 12	5~54	5 6	16	
	20	30~1200	4 5 6 8 10 12	6~60	6 7	18	
	25	35~1200	4 5 6 8 10 12 16	6~75	6 7	23	1.0 or Less
	30	35~1500	6 8 10 12 16 20 24	6~90	7	28	

Coarse Thread Dimension M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

V+K/2+1≤L/2 or G+Q/2+1≤L/2 is required. For One End Tapped Type, G≤L-Mx2-Qx2 is required.

When Mx2.5+4≥L, tap pilot holes may go through.

Threaded Type, One End Threaded with O.D. same as Shaft O.D.

Part Number Type	D	1mm Increment L	F	B (Threaded)	B (One End Threaded with O.D. same as Shaft O.D.)	Selection P	Slot Dimension G (1mm Increment)	Q (Selection)	D1	(Y) Max.	R	C
Threaded Type SFNS SSFNS PSFNS PSSFNS One End Threaded with O.D. same as Shaft O.D. SFQS SSFQS PSFQS PSSFQS Shafts with O.D. same as Shaft O.D. are available for * sizes only.	*6	25~598	2≤F≤Px5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 B≥Pitchx3	Pitchx3≤B≤Mx5 For One End Threaded with O.D. same as Shaft O.D., L dimensions have priority, thus the effective thread length will be B-(Pitchx2).	3 4 5 6	5~18	4	5	600	0.3 or Less	
	*8	25~798				3 4 5 6 8	5~24	4 5	7	800		
	*10	25~798				4 5 6 8 10	5~30	4 5	9	800		
	*12	25~998				5 6 8 10 12	5~36	5	11	1000		0.5 or Less
	13	25~998				5 6 8 10 12	5~39	5	11	1000		
	15	25~998				5 6 8 10 12	5~45	5 6	13	1000		
	*16	25~1198				5 6 8 10 12 16	5~48	5 6	14	1200		
	18	25~1198				5 6 8 10 12 16	5~54	5 6	16	1200		
	*20	25~1198				6 8 10 12 16 20	6~60	6 7	18	1200		1.0 or Less
	25	25~1198				8 10 12 16 20 24	6~75	6 7	23	1200		
	*30	25~1498				8 10 12 16 20 24 30	6~90	7	28	1500		

V+K/2+1≤L/2 or G+Q/2+1≤L/2 is required.

Alterations

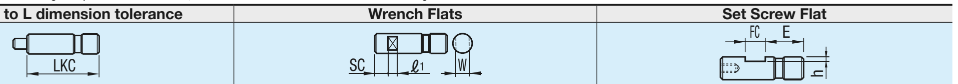
Part Number	-	L	-	M	-	F	-	B	-	P (PMC, PSC)	-	V	-	K	-	G	-	Q	-	(LKC, SC, FC)
PSFNS8	-	650			-	F10	-	B8	-	P4					-	G18	-	Q4	-	LKC

The distance between set screw grooves should be greater than 2mm for alterations.

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114

Alterations may lower hardness. See P.112

Alterations	Alteration to L dimension tolerance	Wrench Flats	Set Screw Flat
Code	LKC	SC	FC
Spec.	Changes L tolerance. Ordering Code LKC L<200···L±0.03 200≤L<500···L±0.05 L≥500···L±0.1 L dimensions can be specified in 0.1mm increment for LKC. Not applicable to One End Threaded Type when D-P≤2. Not applicable to One End Threaded with O.D. same as Shaft O.D.	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0 (see table below) Not applicable to Solid Type	Adds a screw flat. Ordering Code FC10-E8 FC, E=1mm Increment FC≤Dx3 When 1.5xD<FC, FC≤L/2 E=0 or E≥2 (see table below)



D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
15	13	
16	14	10
18	16	
20	17	
25	22	
30	27	15

D	h
6~18	1
20~30	2

Ordering Example

Part Number	-	L	-	M	-	F	-	B	-	P	-	V	-	K	-	G	-	Q
SFJQ16	-	100									-	V10	-	K5	-	G10	-	Q5
SSFTS20	-	500	-	M10											-	G10	-	Q7
PSFNS8	-	650			-	F10	-	B8	-	P4					-	G20	-	Q4

Solid, Both Ends Grooved

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1500
SFJQ	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
SSFJQ	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
PSFJQ	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
PSSFJQ	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												

Solid, One End Grooved

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1500
SFJS	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
SSFJS	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
PSFJS	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
PSSFJS	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												

One End Tapped

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1500
SFTS	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
SSFTS	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
PSFTS	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
PSSFTS	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												

One End Threaded
One End Threaded with O.D. same as Shaft O.D.

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1498
SFNS SFQS	*6									-	-	-	-
	*8										-	-	-
	*10										-	-	-
	*12, 13											-	-
	15, *16												-
	18, *20												-
	25												-
	*30												
SSFNS SSFQS	*6									-	-	-	-
	*8										-	-	-
	*10										-	-	-
	*12, 13											-	-
	15, *16												-
	18, *20												-
	25												-
	*30												
PSFNS PSFQS	*6									-	-	-	-
	*8										-	-	-
	*10										-	-	-
	*12, 13											-	-
	15, *16												-
	18, *20												-
	25												-
	*30												
PSSFNS PSSFQS	*6									-	-	-	-
	*8										-	-	-
	*10										-	-	-
	*12, 13											-	-
	15, *16												-
	18, *20												-
	25												-
	*30												

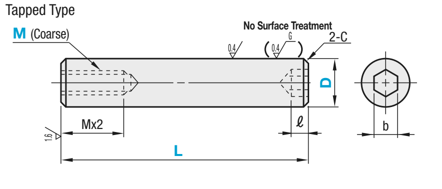
* marked sizes are only available for One End Threaded with O.D. same as Shaft O.D.

Shafts
Hex Socket

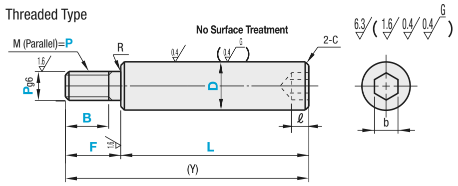
RoHS

Type			D Tol.	Material	Hardness	Surface Treatment
Tapped Type	Stepped and Tapped Type	Threaded Type				
SFBT	SFBH	SFBN	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening ☞ P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFBT	SSFBH	SSFBN		EN 1.4125 Equiv.		-
PSFBT	PSFBH	PSFBN		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFBT	PSSFBH	PSSFBN		EN 1.4125 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
RSFBT	RSFBH	RSFBN		EN 1.3505 Equiv.		LTBC Plating

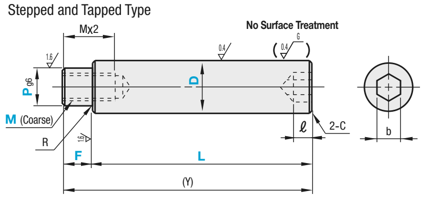
Tapped Type



Threaded Type



Stepped and Tapped Type



Features of LTBC Plating ☞ P.128
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness ☞ P.111
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).

Hex Socket Dimensions

D	b	Hex Socket Depth ℓ
6	2.5	3.5
8	3	4.5
10	4	6
12, 13, 15	5	7.5
16, 18	6	9
20	8	12

Tapped Type, Stepped and Tapped Type

Part Number: Type (Tapped Type)	Part Number: Type (Stepped and Tapped Type)	D	1mm Increment: L (Tapped)	1mm Increment: L (Stepped and Tapped)	F	P	Selection: M (Tapped)	Selection: M (Stepped and Tapped)	(Y) Max.	R	C
SFBT SSFBT PSFBT PSSFBT RSFBT (L≤500)	SFBH SSFBH PSFBH PSSFBH RSFBH (L≤500)	*6	20~ 300	-	2≤F≤Px4	-	3	-	-	0.3 or Less	0.5 or Less
		8	20~ 400	25~ 400		6	3 4 5	3	424		
		10	20~ 500	25~ 500		6~ 8	3 4 5 6	3 4 5	532		
		12	20~ 600	25~ 600		6~10	4 5 6 8	3 4 5 6	640		
		13	25~ 650	25~ 650		6~11	4 5 6 8	3 4 5 6 8	694		
		15	25~ 750	25~ 750		6~13	4 5 6 8 10	3 4 5 6 8 10	802		
		16	30~ 800	25~ 800		6~14	4 5 6 8 10	3 4 5 6 8 10	856		
		18	30~ 900	25~ 900		8~16	4 5 6 8 10 12	4 5 6 8 10 12	964		
		20	30~1000	25~1000		8~17	4 5 6 8 10 12	4 5 6 8 10 12	1068		1.0 or Less

D=6 is available for Tapped Type only.

- Tapped Type: Mx2.5+4+ℓ≤L; When Mx2.5+4+ℓx1.5≥L, tap pilot holes may go through.
- Stepped and Tapped Type: P≥M+3; Mx2.5+4+ℓ≤Y; When Mx2.5+4+ℓx1.5≥Y, tap pilot holes may go through.

Threaded Type

Part Number: Type (Threaded Type)	D	1mm Increment: L	F	B (Threaded)	P Selection	(Y) Max.	R	C
SFBN SSFBN PSFBN PSSFBN RSFBN (L≤500)	6	25~ 300	2≤F≤Px5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P=12, 16) B≤F-5 B≥Pitchx3	3 4 5	330	0.3 or Less	0.5 or Less
	8	25~ 400			3 4 5 6	440		
	10	25~ 500			4 5 6 8	550		
	12	25~ 600			5 6 8 10	660		
	13	25~ 650			5 6 8 10 12	715		
	15	25~ 750			5 6 8 10 12	825		
	16	25~ 800			5 6 8 10 12	880		
	18	25~ 900			5 6 8 10 12 16	990		
	20	25~1000			6 8 10 12 16	1100		1.0 or Less

D>P

Ordering Example

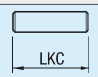
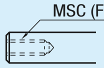
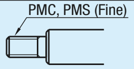
Part Number	-	L	-	F	-	B	-	P	-	M
SFBT20	-	525							-	M8
SFBH20	-	400	-	F25			-	P16	-	M10
SFBN20	-	500	-	F25	-	B20	-	P16		

Alterations

Part Number - L - F - B - P (PMC, PMS) - M (MSC) - (LKC···etc.)
SFBN20 - 250 - F40 - B30 - P10 - LKC

Coarse Thread Dimension	
M	pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0

Alterations may lower hardness. See ☞ P.112

Alterations	Alteration to L dimension tolerance	Fine Tap	Fine Thread
	 LKC	 MSC (Fine)	 PMC, PMS (Fine)
Code	LKC	MSC	PMC•PMS
Spec.	Changes L tolerance. Ordering Code LKC L<200··· L±0.03 200≤L<500 ··· L±0.05 L≥500··· L±0.1 For use of LKC L dimensions can be specified in 0.1mm increment. Not applicable when D-P≤2.	Changes tapped threads to fine tapped threads shown in the table below. Ordering Code MSC14 Applicable to Tapped Type (see MSC table) Specify M dimensions with MSC. M dimension is equal to MSC. Not applicable to Stepped and Tapped Type.	Changes the threads to fine threads shown in the table below. (PMC→Applicable to bearing nut fine thread pitches.) (PMS→Applicable to cylinder fine thread pitches.) Ordering Code PMC17 Applicable to Threaded Type only. (see PMC/PMS table) Specify P dimensions with PMC (PMS). P dimension is equal to that of PMC(PMS).

MSC

D	MSC			
12, 13	8			
15, 16	8	10		
18	8	10	12	
20	8	10	12	14
Pitch	1.0	1.25	1.5	

PMC / PMS

D	PMC									PMS			
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	12			10			
15			5	6	8	10	12			10	12		
16			5	6	8	10	12	15		10	12	14	
18			5	6	8	10	12	15	17	10	12	14	
20				6	8	10	12	15	17	10	12	14	18
Pitch	0.35	0.5		0.75	1.0				1.5	1.25	1.5		

Tapped Type

Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000
SFBT	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
SSFBT	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
PSFBT	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
PSSFBT	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
RSFBT	6						-	-			
	8							-			
	10										
	12								-	-	-
	13										
	15										
	16										
	18, 20										

Threaded Type

Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000
SFBN	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
SSFBN	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
PSFBN	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
PSSFBN	6						-	-	-	-	-
	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
RSFBN	6						-	-			
	8							-			
	10										
	12								-	-	-
	13										
	15										
	16										
	18, 20										

Stepped and Tapped Type

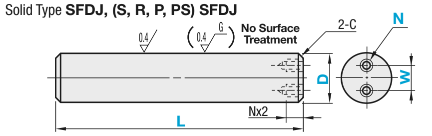
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000
SFBH	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
SSFBH	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
PSFBH	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
PSSFBH	8							-	-	-	-
	10								-	-	-
	12									-	-
	13										-
	15, 16										-
	18, 20										
RSFBH	8							-			
	10										
	12										
	13								-	-	-
	15										
	16										
	18, 20										

Shafts
One End Two Tapped Holes

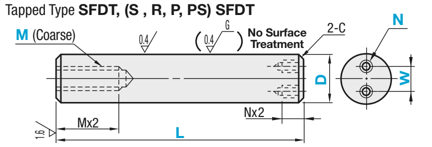
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Type				D Tol.	M Material	H Hardness	S Surface Treatment
Solid Type	Tapped Type	Stepped and Tapped Type	Threaded Type				
SFDJ	SFDT	SFDG	SFDN	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFDJ	SSFDT	SSFDG	SSFDN		EN 1.4125 Equiv.		
PSFDJ	PSFDT	PSFDG	PSFDN		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More

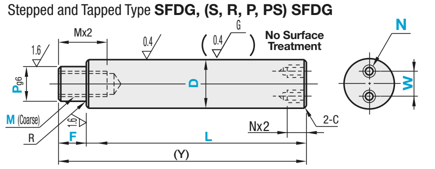
Solid Type **SFDJ, (S, R, P, PS) SFDJ**



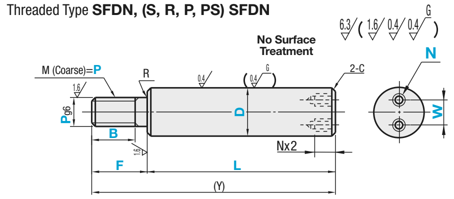
Tapped Type **SFDT, (S , R, P, PS) SFDT**



Stepped and Tapped Type **SFDG, (S, R, P, PS) SFDG**



Threaded Type **SFDN, (S, R, P, PS) SFDN**



Solid Type, One End Tapped Type, One End Stepped and Tapped Type

Part Number		1mm Increment				Selection		W specified in 1mm Increment	N Selection	(Y) Max.	R	C
Type	D	L (Solid / Tapped)	L (Stepped and Tapped)	F	P	M (Tapped)	M (Stepped and Tapped)					
Solid Type / Tapped Type / Stepped and Tapped SFDJ SFDT SFDG SSFDJ SSFDT SSFDG PSFDJ PSFDT PSFDG	15	25~750	25~750	2≤F≤Px4	6~13	4 5 6 8 10	3 4 5 6 8 10	D-W-N≥4 W-N≥3	4 5 6 8 10 12	802	0.3 or Less	0.5 or Less
	16	30~800	25~800		6~14	4 5 6 8 10	3 4 5 6 8 10			856		
	18	30~900	25~900		8~16	4 5 6 8 10 12	4 5 6 8 10 12			964		
	20	30~1000	25~1000		8~17	4 5 6 8 10 12	4 5 6 8 10 12			1068		1.0 or Less
	25	35~1200	25~1198		8~22	4 5 6 8 10 12 16	4 5 6 8 10 12 16			1200		
	30	35~1500	25~1498		9~27	6 8 10 12 16 20	5 6 8 10 12 16 20 24			1500		
	35	35~1500	25~1498		9~32	8 10 12 16 20 24	5 6 8 10 12 16 20 24			1500	0.5 or Less	
	40	50~1500	25~1498		11~37	10 12 16 20 24 30	6 8 10 12 16 20 24 30			1500		
	50	50~1500	25~1498		11~47	12 16 20 24 30	6 8 10 12 16 20 24 30			1500		

• Tapped Type Not applicable when Mx2.5+4+Nx2.5+4≤L. • Stepped and Tapped Type P≥M+3 Not applicable when Mx2.5+4+Nx2.5+4≤L.

Threaded Type

Part Number		1mm Increment			P	W specified in 1mm Increment	N Selection	(Y) Max.	R	C
Type	D	L	F	B (Threaded)	Selection					
Threaded Type SFDN SSFDN PSFDN	15	25~750	2≤F≤Px5	(When P=5, 6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 B≥Pitchx3	5 6 8 10 12	D-W-N≥4 W-N≥3	4 5 6 8 10 12	825	0.3 or Less	0.5 or Less
	*16	25~800			5 6 8 10 12			880		
	18	25~900			5 6 8 10 12 16			990		
	*20	25~1000			6 8 10 12 16			1100		1.0 or Less
	25	25~1198			8 10 12 16 20 24			1200		
	*30	25~1498			8 10 12 16 20 24			1500		
	35	25~1498			10 12 16 20 24 30			1500	0.5 or Less	
	40	25~1498			12 16 20 24 30			1500		
	50	25~1498			16 20 24 30			1500		

D>P

Ordering Example

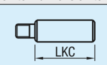
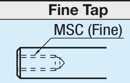
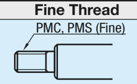
Part Number	-	L	-	F	-	B	-	P	-	M	-	W	-	N
SFDJ20	-	75									-	W10	-	N4
SFDT20	-	525							-	M8	-	W7	-	N4
SFDG20	-	400	-	F25			-	P16	-	M10	-	W12	-	N4
SFDN20	-	500	-	F30	-	B20	-	P16			-	W8	-	N4

Alterations

Part Number - L - F - B - P (PMC, PMS) - M (MSC) - W - N - (LKC, MSC, PMC, PMS)
SFDN30 - 250 - F40 - B30 - PMC10 - W10 - N4 - LKC

Coarse Thread Dimension		Coarse Thread Dimension	
M	Pitch	M	Pitch
3	0.5	12	1.75
4	0.7	16	2.0
5	0.8	20	2.5
6	1.0	24	3.0
8	1.25	30	3.5
10	1.5		

Alterations may lower hardness. See P.112

Alterations	Alteration to L dimension tolerance	Fine Tap	Fine Thread
			
Code	LKC	MSC	PMC, PMS
Spec.	Changes L tolerance. Ordering Code LKC L<200···L±0.03 200≤L<500···L±0.05 L≥500···L±0.1 L dimensions can be specified in 0.1mm increment for LKC. Not applicable when D-P≤2.	Changes tapped threads to fine tapped threads shown in the table below. Ordering Code MSC14 Applicable to Tapped Type Specify M dimensions with MSC. M dimension is equal to MSC. Not applicable to Stepped and Tapped Type.	Changes the threads to fine threads shown in the table below. (PMC is for bearing nut fine thread pitches.) (PMS is for cylinder fine thread pitches.) Ordering Code PMC17 Applicable to Threaded Type only. Specify P dimensions with PMC (PMS). P dimension is equal to that of PMC(PMS).

D	MSC				
15, 16	8	10			
18	8	10	12		
20	8	10	12	14	
25~35	8	10	12	14	18
40		10	12	14	18
50			12	14	18
Pitch	1.0	1.25	1.5		

D	PMC										PMS			
15	5	6	8	10	12						10	12		
16	5	6	8	10	12	15					10	12	14	
18	5	6	8	10	12	15	17				10	12	14	
20		6	8	10	12	15	17				10	12	14	18
25			8	10	12	15	17	20			10	12	14	18
30			8	10	12	15	17	20	25		10	12	14	18
35				10	12	15	17	20	25	30	10	12	14	18
40					12	15	17	20	25	30		12	14	18
50						15	17	20	25	30			14	18
Pitch	0.5	0.75	1.0						1.5		1.25	1.5		

Solid Type

Part Number		Unit Price											
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
SFDJ	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												
SSFDJ	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												
PSFDJ	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												

Stepped and Tapped Type

Part Number		Unit Price											
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
SFDG	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												
SSFDG	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												
PSFDG	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												

Tapped Type

Part Number		Unit Price											
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
SFDT	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												
SSFDT	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												
PSFDT	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												

Threaded Type

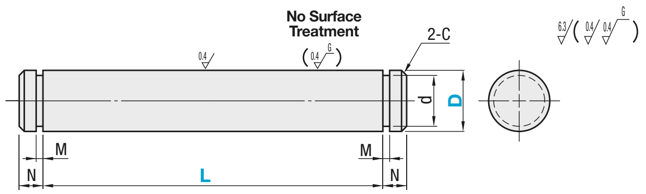
Part Number		Unit Price											
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
SFDN	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												
SSFDN	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												
PSFDN	15, 16										-	-	-
	18, 20											-	-
	25												-
	30												
	35												
	40												
	50												

Shafts
With Retaining Ring Grooves


RoHS

- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128
- For O.D. tolerance f8 type, D needs to be 6 or more.

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFAR	SFUR	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSFAR	SSFUR	-	EN 1.4125 Equiv.		
PSFAR	PSFUR	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFAR	PSSFUR	-	EN 1.4125 Equiv.		
RSFAR	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGR	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More ~
-	-	PSSFGR	EN 1.4301 Equiv.		



D	D Tol. g6	D Tol. h5	D Tol. f8
3	-0.002 -0.008	0 -0.004	-
4	-0.004 -0.012	0 -0.005	
5			
6			-0.010 -0.028
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			

Part Number Type	D	L specified in 1mm Increment	N	M	M Tolerance	d	d Tolerance	Applicable Retaining Ring	C
(D Tolerance g6) SFAR, SSFAR, PSFAR, PSSFAR, RSFAR (L≤500); (D Tolerance h5) SFUR, SSFUR, PSFUR, PSSFUR; (D Tolerance f8) PSFGR (D≥6), PSSFGR (D≥6)	3	10~400	2	0.5	+0.05 0	2	+0.06 0	NETW□2	0.5 or Less
	4	10~400		0.7	+0.1 0	3		NETW□3	
	5	10~400				4	+0.075 0	NETW□4	
	6	20~600				5		NETW□5	
	8	20~800	3	0.9		7	+0.09 0	NETW□7	
	10	20~800		1.15	+0.14 0	9.6	0 -0.09	STW□10	
	12	20~1000	4			11.5	0 -0.11	STW□12	
	13	25~1000				12.4		STW□13	
	15	25~1200				14.3		STW□15	
	16	30~1200				15.2		STW□16	
	18	30~1200		1.35		17		STW□18	
	20	30~1200				19	0 -0.21	STW□20	1.0 or Less
	25	35~1200	5			23.9		STW□25	
	30	35~1200		1.65		28.6		STW□30	

For E Type Retaining Rings, see P.2302; and for C Type Retaining Rings, see P.2303.

Ordering Example

Part Number	-	L
SFAR20	-	300

Alterations

Part Number	-	L(LLC)	-	(NWC)
SFAR20	-	LLC300		

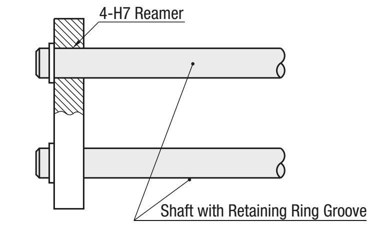
Alterations	One End w/o Retaining Ring Groove	Length Leader Position Change
	L	N LLC N
Code	NWC	LLC
Spec.	One end will be left w/o retaining ring groove. Ordering Code NWC	Dimensioning leader position of L dimension will be altered to the outside of retaining ring grooves. Ordering Code LLC300 Specify L dimensions with LLC. LLC=1mm Increment

Alterations may lower hardness. See P.112

Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200
SFAR SFUR	3, 4, 5							-	-	-	-	-
	6									-	-	-
	8										-	-
	10										-	-
	12											-
	13											-
	15, 16											
	18											
	20											
	25											
	30											
SSFAR SSFUR	3, 4, 5							-	-	-	-	-
	6									-	-	-
	8										-	-
	10										-	-
	12											-
	13											-
	15, 16											
	18, 20											
	25											
	30											
PSFAR PSFUR	3, 4, 5							-	-	-	-	-
	6									-	-	-
	8										-	-
	10										-	-
	12, 13											-
	15, 16											
	18, 20											
	25											
	30											
PSSFAR PSSFUR	3, 4, 5							-	-	-	-	-
	6									-	-	-
	8, 10										-	-
	12											-
	13											-
	15, 16											
	18, 20											
	25											
	30											
RSFAR	3, 4, 5							-				
	6											
	8											
	10											
	12											
	13								-	-	-	-
	15											
	16											
	18											
	20											
	25											
	30											

Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200
PSFGR	6					-	-	-
	8						-	-
	10						-	-
	12							-
	13							-
	15, 16							
	18, 20							
	25							
	30							
PSSFGR	6					-	-	-
	8						-	-
	10						-	-
	12							-
	13							-
	15, 16							
	18, 20							
	25							
	30							

Example

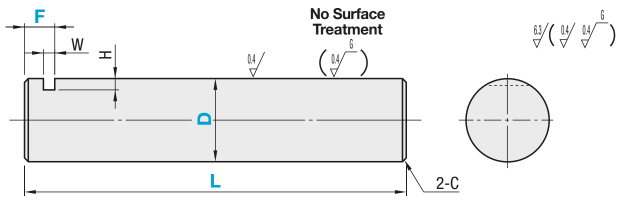


Shafts
Keyway

Features of LTBC Plating P.128
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFAK	SFUK	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFAK	SSFUK	-	EN 1.4125 Equiv.		
PSFAK	PSFUK	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFAK	PSSFUK	-	EN 1.4125 Equiv.		
RSFAK	-	-	EN 1.3505 Equiv.		LTBC Plating
-	-	PSFGK	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More ~
-	-	PSSFGK	EN 1.4301 Equiv.		

D Tol.			
D	g6	h5	f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064



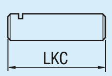
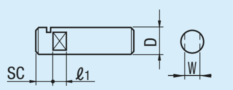
Part Number		1mm Increment		W	H	C
Type	D	L	F			
(D Tolerance g6) SFAK, SSFAK, PSFAK, PSSFAK, RSFAK (D≤30, L≤500); (D Tolerance h5) SFUK, SSFUK, PSFUK, PSSFUK; (D Tolerance f8) PSFGK, PSSFGK	6	20~600	5≤F≤L/2	3.1	2	0.5 or Less
	8	20~800				
	10	20~800			3	
	12	20~1000				
	13	25~1000				
	15	25~1200				
	16	30~1200				
	18	30~1200				
	20	30~1200			4	1.0 or Less
	25	35~1200			5	
	30	35~1500	7≤F≤L/2	5.1	6	
	35	35~1500			7	
	40	50~1500			8	
	50	65~1500			10	

Ordering Example

Part Number	-	L	-	F
SFAK16	-	265	-	F25

Alterations

Part Number	-	L	-	F	-	(LKC, SC)
SFAK16	-	625	-	F25	-	LKC

	Alteration to L dimension tolerance	Wrench Flats
Alterations	 LKC	 SC, ℓ1, D, W
Code	LKC	SC
Spec.	Changes L tolerance. Ordering Code LKC L<200···›L±0.03 200≤L<500 ···›L±0.05 L≥500···›L±0.1 L dimensions can be specified in 0.1mm increment for LKC.	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0

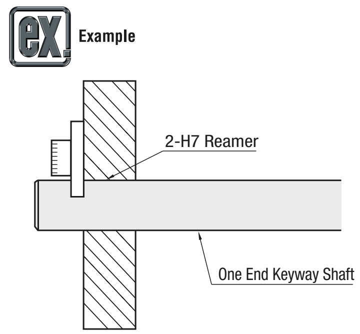
D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

Alterations may lower hardness. see P.112
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114

Part Number		Unit Price											
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
SFAK SFUK	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
	35												
	40												
	50	-											
SSFAK SSFUK	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
	35												
	40												
	50	-											
PSFAK PSFUK	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
	35												
	40												
	50	-											
PSSFAK PSSFUK	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12, 13											-	-
	15, 16												-
	18, 20												-
	25												-
	30												
	35												
	40												
	50	-											
RSFAK	6								-	-	-	-	-
	8												
	10												
	12												
	13												
	15												
	16												
	18												
	20												
	25												
	30												

Part Number		Unit Price							
Type	D	Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSFGK	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18								-
	20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGK	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Example



Shafts

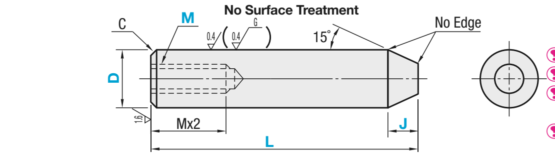
One End Tapered, One End Tapped / One End Stepped and Tapped / One End Threaded

■One End Tapered, One End Tapped

Type		Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5			
SFTF	SFLU	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFTF	SSFLU	EN 1.4125 Equiv.		
PSFTF	PSFLU	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFTF	PSSFLU	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	

D	D Tol. g6	D Tol. h5
6	-0.004 -0.012	0 -0.005
8 10	-0.005 -0.014	0 -0.006

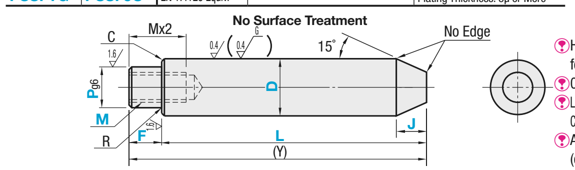
D	D Tol. g6	D Tol. h5
12 13 15 16 18	-0.006 -0.017	0 -0.008
20	-0.007 -0.020	0 -0.009



Hardness of J+10 area will be lower due to annealing required for machining.
Case hardening and plating layers do not remain on the tapered area.
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).

■One End Tapered, One End Stepped and Tapped

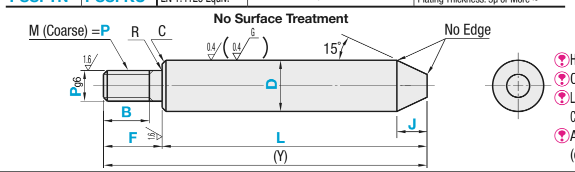
Type		Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5			
SFTG	SFJU	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFTG	SSFJU	EN 1.4125 Equiv.		
PSFTG	PSFJU	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFTG	PSSFJU	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	



Hardness of J+10 area will be lower due to annealing required for machining.
Case hardening and plating layers do not remain on the tapered area.
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).

■One End Tapered, One End Threaded

Type		Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5			
SFTN	SFKU	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFTN	SSFKU	EN 1.4125 Equiv.		
PSFTN	PSFKU	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFTN	PSSFKU	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	



Hardness of J+10 area will be lower due to annealing required for machining.
Case hardening and plating layers do not remain on the tapered area.
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).

■One End Tapered, One End Tapped

Part Number Type		D	1mm Increment L	1mm Increment J	M (Coarse) Selection	C
(D Tolerance g6) SFTF SSFTF PSFTF PSSFTF	(D Tolerance h5) SFLU SSFLU PSFLU PSSFLU	6	25~200	5~7	3	0.5 or Less
		8	25~200	5~10	3 4 5	
		10	30~200	5~14	3 4 5 6	
		12	40~300	5~18	4 5 6 8	
		13	40~300	5~20	4 5 6 8	
		15	50~300	10~24	4 5 6 8	
		16	50~500	10~25	4 5 6 8 10	
		18	60~500	10~28	4 5 6 8 10 12	
		20	60~500	10~32	4 5 6 8 10 12	1.0 or Less

L requires L-J≥20.

■One End Tapered, One End Stepped and Tapped

Part Number Type		D	1mm Increment L	F	P	J	M (Coarse) Selection	(Y) Max.	R	C
(D Tolerance g6) SFTG SSFTG PSFTG PSSFTG	(D Tolerance h5) SFJU SSFJU PSFJU PSSFJU	8	25~198	2≤F≤Px4	6	5~10	3	200	0.3 or Less	0.5 or Less
		10	30~198		6~8	5~14	3 4 5	200		
		12	40~298		6~10	5~18	3 4 5 6	300		
		13	40~298		6~11	5~20	3 4 5 6 8	300		
		15	50~298		6~13	10~24	3 4 5 6 8 10	300		
		16	50~498		6~14	10~25	3 4 5 6 8 10	500		
		18	60~498		8~16	10~28	4 5 6 8 10 12	500		
		20	60~498		8~17	10~32	4 5 6 8 10 12	500		1.0 or Less

P dimensions require M+3≤P. L requires L-J≥20.

■One End Tapered, One End Threaded

Part Number Type		D	1mm Increment L	F	B	P Selection	1mm Increment J	(Y) Max.	R	C
(D Tolerance g6) SFTN SSFTN PSFTN PSSFTN	(D Tolerance h5) SFKU SSFKU PSFKU PSSFKU	6	25~198	2≤F≤Px5	B≤F-2 (When P≤6) B≤F-3 (When P=8, 10) B≤F-5 (When P≥12) B=0 (W/o Threads)	3 4 5 6	5~7	200	0.3 or Less	0.5 or Less
		8	25~198			3 4 5 6 8	5~10	200		
		10	30~198			4 5 6 8 10	5~14	200		
		12	40~298			5 6 8 10 12	5~18	300		
		13	40~298			5 6 8 10 12	5~20	300		
		15	50~298			5 6 8 10 12	10~24	300		
		16	50~498			5 6 8 10 12 16	10~25	500		
		18	60~498			5 6 8 10 12 16	10~28	500		
		20	60~498			5 6 8 10 12 16 20	10~32	500		1.0 or Less

When D=P, specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimension of the product will be F -(Pitchx2).
Thread machining will not be applied when B=0 is specified. L requires L-J≥20. B≥Pitchx3 is required.

Ordering Example

• One End Tapered, One End Tapped

Part Number - L - J - M

SFTF20 - 350 - J15 - M6

• One End Tapered, One End Stepped and Tapped

Part Number - L - F - P - J - M

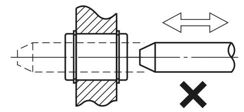
SFTG20 - 350 - F25 - P16 - J10 - M8

• One End Tapered, One End Threaded

Part Number - L - F - B - P - J

SFTN20 - 350 - F40 - B30 - P10 - J10

Example



Not suitable for usage requiring frequent insertions with Linear Bushings. (Linear bushing damages may result.)

■One End Tapered, One End Tapped

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
SFTF SFLU	6					-	-	-
	8					-	-	-
	10					-	-	-
	12						-	-
	13						-	-
	15						-	-
	16							
	18, 20	-						
SSFTF SSFLU	6					-	-	-
	8					-	-	-
	10					-	-	-
	12						-	-
	13						-	-
	15						-	-
	16							
	18, 20	-						

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
PSFTF PSFLU	6					-	-	-
	8, 10					-	-	-
	12, 13						-	-
	15						-	-
	16							
	18, 20	-						
PSSFTF PSSFLU	6, 8, 10					-	-	-
	12, 13						-	-
	15						-	-
	16							
	18, 20	-						

■One End Tapered, One End Stepped and Tapped

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~498
SFTG SFJU	8, 10					-	-	-
	12						-	-
	13						-	-
	15						-	-
	16							
	18, 20	-						
SSFTG SSFJU	8, 10					-	-	-
	12, 13						-	-
	15						-	-
	16							
	18, 20	-						

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~498
PSFTG PSFJU	8, 10					-	-	-
	12, 13						-	-
	15						-	-
	16							
	18, 20	-						
PSSFTG PSSFJU	8, 10					-	-	-
	12, 13						-	-
	15						-	-
	16							
	18, 20	-						

■One End Tapered, One End Threaded

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~498
SFTN SFKU	6, 8, 10					-	-	-
	12						-	-
	13						-	-
	15						-	-
	16							
	18, 20	-						
SSFTN SSFKU	6, 8, 10					-	-	-
	12, 13						-	-
	15						-	-
	16							
	18, 20	-						

Part Number Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~498
PSFTN PSFKU	6, 8, 10					-	-	-
	12, 13						-	-
	15						-	-
	16							
	18, 20	-						
PSSFTN PSSFKU	6, 8, 10					-	-	-
	12, 13						-	-
	15						-	-
	16							
	18, 20	-						

Alterations

• One End Tapered, One End Tapped

Part Number - L - J - M - (LKC, SC)

SFTF20 - 350 - J15 - M6 - LKC

• One End Tapered, One End Stepped and Tapped

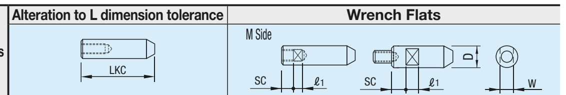
Part Number - L - F - P - J - M - (SC)

SFTG20 - 350 - F25 - P16 - J10 - M8 - SC5

• One End Tapered, One End Threaded

Part Number - L - F - B - P - J - (SC)

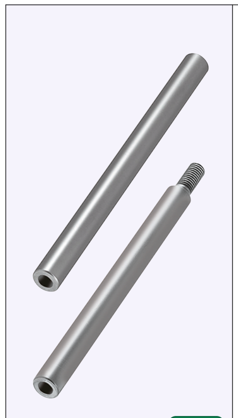
SFTN20 - 350 - F40 - B30 - P10 - J10 - SC5



Alterations	Alteration to L dimension tolerance	Wrench Flats
Code	LKC	SC
Spec.	Changes L tolerance. Ordering Code LKC L<200···L±0.03 200≤L<500 ···L±0.05 L=500···L±0.1 L dimensions can be specified in 0.1mm increment for LKC. Not applicable to D=P. Not Applicable to One End Stepped and Tapped One End Threaded Type.	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L-J SC≥0

D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	

Alterations may lower hardness. See P.112



RoHS

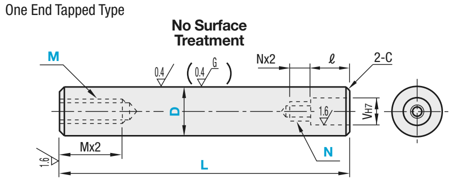
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

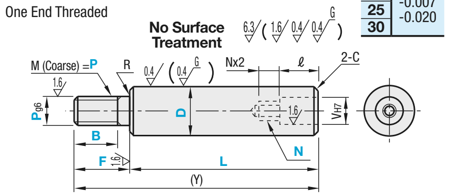
Type				M Material	H Hardness	S Surface Treatment
One End Tapped	One End Stepped and Tapped	One End Threaded	One End Threaded with O.D. same as Shaft O.D.			
SFIT	SFIG	SFIN	SFIQ	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFIT	SSFIG	SSFIN	SSFIQ	EN 1.4125 Equiv.		
PSFIT	PSFIG	PSFIN	PSFIQ	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFIT	PSSFIG	PSSFIN	PSSFIQ	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	

D Tol.	
D	g6
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

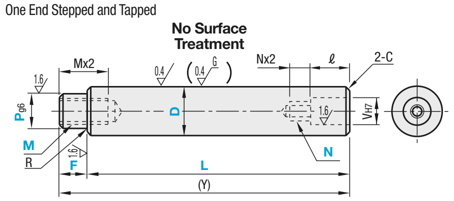
One End Tapped Type



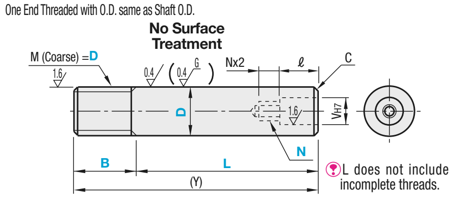
One End Threaded



One End Stepped and Tapped



One End Threaded with O.D. same as Shaft O.D.



L does not include incomplete threads.

One End Tapped, One End Stepped and Tapped

Part Number		1mm Increment			Selection		Pilot Dimensions			(Y) Max.	R	C
Type	D	L	F	P	M Coarse (Tapped)	M Coarse (Stepped and Tapped)	N (Selection)	V Hole Diameter	ℓ Hole Depth			
Tapped Type SFIT SSFIT PSFIT PSSFIT Stepped and Tapped Type SFIG SSFIG PSFIG PSSFIG	12	25~1000	2≤F≤Px4	6~10	4 5 6 8	4 5 6	4	8	9	1000	0.3 or Less	0.5 or Less
	13	25~1000		6~11	4 5 6 8	4 5 6 8	4 5	10	11	1000		
	15	25~1000		6~13	4 5 6 8 10	4 5 6 8 10	4 5			1000		
	16	30~1200		6~14	4 5 6 8 10	4 5 6 8 10	4 5 6	12	13	1200		
	18	30~1200		8~16	4 5 6 8 10 12	4 5 6 8 10 12	4 5 6			1200		1.0 or Less
	20	30~1200		8~17	4 5 6 8 10 12	4 5 6 8 10 12	5 6 8 10	16	17	1200		
	25	35~1200		8~22	4 5 6 8 10 12 16	4 5 6 8 10 12 16	6 8 10 12	20	21	1200		
	30	35~1500		9~27	6 8 10 12 16 20 24	6 8 10 12 16 20 24	6 8 10 12			1500		

Coarse Thread Dimension	
M	Pitch
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

L(Y)>Mx2.5+4+ℓ+Nx1.5+4 is required to have effective thread length. • One End Stepped and Tapped P dimensions require M+3≤P.

One End Threaded, One End Threaded with O.D. same as Shaft O.D.

Part Number		1mm Increment				Selection	Pilot Dimensions			(Y) Max.	R	C
Type	D	L	F	B (Threaded)	B (One End Threaded with O.D. same as Shaft O.D.)	P	N (Selection)	V Hole Diameter	ℓ Hole Depth			
Threaded Type SFIN SSFIN PSFIN PSSFIN One End Threaded with O.D. same as Shaft O.D. SFIQ SSFIQ PSFIQ PSSFIQ Shafts with O.D. same as Shaft O.D. are available for * sizes only.	*12	25~998	2≤F≤Px5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 B≥Pitchx3	2≤B≤Px5 For One End Threaded with O.D. same as Shaft O.D., L dimensions have priority, thus the effective thread length will be B-(Pitchx2).	5 6 8 10 12	4	8	9	1000	0.3 or Less	0.5 or Less
	13	25~998				5 6 8 10 12	4 5	10	11	1000		
	15	25~998				5 6 8 10 12	4 5			1000		
	*16	25~1198				5 6 8 10 12 16	4 5 6	12	13	1200		
	18	25~1198				5 6 8 10 12 16	4 5 6			1200		
	*20	25~1198				6 8 10 12 16 20	5 6 8 10	16	17	1200		1.0 or Less
	25	25~1198				8 10 12 16 20 24	6 8 10 12	20	21	1200		
	*30	25~1498				8 10 12 16 20 24 30	6 8 10 12			1500		

Overall length L requires Nx2.5+ℓ≤L.

One End Tapped

Part Number		Unit Price											
Type	D	Min. L 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
SFIT	12											-	-
	13											-	-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
SSFIT	12											-	-
	13											-	-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
PSFIT	12											-	-
	13											-	-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
PSSFIT	12											-	-
	13											-	-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												

One End Stepped and Tapped

Part Number		Unit Price											
Type	D	Min. L 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
SFIG	12											-	-
	13											-	-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
SSFIG	12											-	-
	13											-	-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
PSFIG	12											-	-
	13											-	-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
PSSFIG	12											-	-
	13											-	-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												

One End Threaded
One End Threaded with O.D. same as Shaft O.D.

Part Number		Unit Price											
Type	D	Min. L 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1498
SFIN SFIQ	*12											-	-
	13											-	-
	15												-
	*16												-
	18												-
	*20												-
	25												-
	*30												
SSFIN SSFIQ	*12											-	-
	13											-	-
	15												-
	*16												-
	18												-
	*20												-
	25												-
	*30												
PSFIN PSFIQ	*12											-	-
	13											-	-
	15												-
	*16												-
	18												-
	*20												-
	25												-
	*30												
PSSFIN PSSFIQ	*12											-	-
	13											-	-
	15												-
	*16												-
	18												-
	*20												-
	25												-
	*30												

* marked sizes are only available for One End Threaded with O.D. same as Shaft O.D.

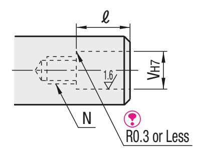
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	M	-	N
SFIT12	-	500					-		-	M4	-	N4
PSSFIG30	-	1000	-	F4			-	P10	-	M6	-	N10

Example

Cautions

• Pilot Drawing



Pilot bore of the precision hole has R0.3 or less. Mating part is required to be C0.4 or better for assembly.

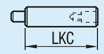
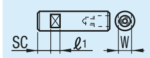
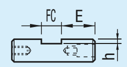
• Pilot Dimensions

D	N (Selection)	V Hole Diameter	ℓ Hole Depth
12	4	8	9
13	4 5	10	11
15	4 5		
16	4 5 6	12	13
18	4 5 6		
20	5 6 8 10	16	17
25	6 8 10 12	20	21
30	6 8 10 12		

Alterations

Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	M (MSC)	-	N	-	(LKC, SC, FC···etc.)
PSSFIG30	-	1000	-	F4			-	P10	-	M6	-	N10	-	LKC

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114 Alterations may lower hardness. See P.112

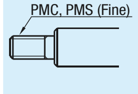
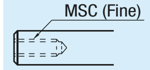
Alterations	Code	Spec.
 LKC	LKC	Changes L tolerance. Ordering Code LKC L<200···L±0.03 200≤L<500···L±0.05 L≥500···L±0.1 L dimensions can be specified in 0.1mm increment for LKC. Not applicable to One End Threaded Type when D-P≤2. Not applicable to One End Threaded with O.D. same as Shaft O.D.
 SC ℓ1 W	SC	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0 SC machining is not applicable to pilot machined areas. SC≤L-ℓ1-ℓ-2
 FC E h	FC	Adds a screw flat. Ordering Code FC10-E8 FC, E=1mm Increment FC≤Dx3 When 1.5xD<FC, FC≤L/2 E=0 or E≥2 FC machining is not applicable to pilot machined areas. E≥ℓ+2

SC:

D	W	ℓ1	D	W	ℓ1
12	10	10	18	16	10
13	11		20	17	
15	13		25	22	
16	14		30	27	15

FC:

D	h
12~18	1
20~30	2

Alterations	Code	Spec.
 PMC, PMS (Fine)	PMC, PMS	Changes the threads to fine threads shown in the table below. (PMC is for bearing nut fine thread pitches.) (PMS is for cylinder fine thread pitches.) Ordering Code PMC17 Applicable to One End Threaded Type only. Specify P dimensions with PMC (PMS). P dimension is equal to that of PMC(PMS).
 MSC (Fine)	MSC	Changes tapped threads to fine tapped threads shown in the table below. Ordering Code MSC14 Only applicable to One End Tapped Type. Specify M dimensions with MSC. M dimension is equal to MSC.

PMC, PMS:

D	PMC				PMS	
12	5	6	8 10		10	
13	5	6	8 10 12		10	
15	5	6	8 10 12		10	12
16	5	6	8 10 12 15		10	12 14
18	5	6	8 10 12 15 17		10	12 14
20		6	8 10 12 15 17		10	12 14 18
25			8 10 12 15 17 20		10	12 14 18
30			8 10 12 15 17 20	25	10	12 14 18
Pitch	0.5	0.75	1.0	1.5	1.25	1.5

MSC:

D	MSC				
12, 13	8				
15, 16	8	10			
18	8	10	12		
20	8	10	12	14	
25~30	8	10	12	14	18
Pitch	1.0	1.25	1.5		

High Precision Linear Shafts

Both Ends Tapped / Both Ends Tapped with Wrench Flats

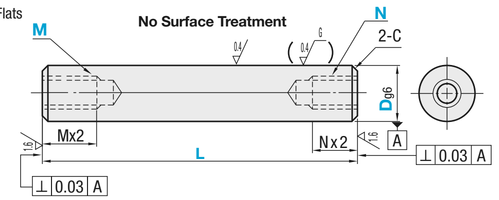
■Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end (⊥ 0.03).

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
Full Length Hardness Guaranteed Shafts P.127
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

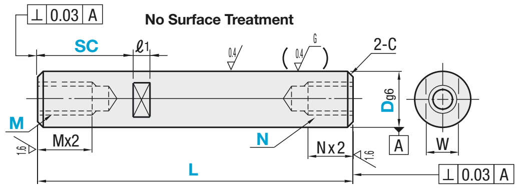
Type: W/o Wrench Flats	Type: With Wrench Flats	D Tol.	M Material	H Hardness	S Surface Treatment
VFJW	VFJZ	g6	EN 1.3505 Equiv.	Induction Hardened Effective Hardened Depth P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSFJW	VSFJZ		EN 1.4125 Equiv.		-
VPFJW	VPFJZ		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSFJW	VPSFJZ		EN 1.4125 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VRJW	VRJZ		EN 1.3505 Equiv.		LTBC Plating

D Tol.	
D	g6
4	-0.004 -0.012
5	
6	
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number: Type	D	L specified in 1mm Increment	M (Coarse), N (Coarse) Selection	Wrench Flats Dimensions: SC	W	ℓ1	C
(W/o Wrench Flats) (D4~D30) VFJW VSFJW VPFJW VPSFJW VRJW (With Wrench Flats) (D6~30) VFJZ VSFJZ VPFJZ VPSFJZ VRJZ	4	25~200	2	-	-	-	0.2 or Less
	5	25~300	2.6 3				
	6	25~300	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	
	8	25~300	3 4 5		7		
	10	25~350	3 4 5 6		8		
	12	25~350	4 5 6 8		10	10	
	13	25~350	4 5 6 8		11		
	15	25~350	4 5 6 8 10		13		
	16	25~350	4 5 6 8 10		14		
	18	25~350	4 5 6 8 10 12		16		
	20	30~450	4 5 6 8 10 12		17		
	25	30~450	4 5 6 8 10 12 16		22		
	30	30~450	6 8 10 12 16 20		27	15	

L requires Mx2+Nx2≤L. When Mx2.5+4+Nx2.5+4≥L, tap pilot holes may go through.

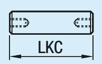
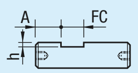
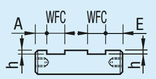
Ordering Example

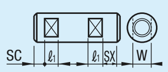
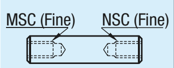
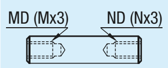
Part Number	-	L	-	M	-	N	-	SC
VFJW20	-	100	-	M8	-	N8		
VFJZ20	-	100	-	M8	-	N8	-	SC10

Alterations

Part Number	-	L	-	M (MSC, MD)	-	N (NSC, ND)	-	SC	-	(LKC···etc.)
VFJW20	-	100	-	M8	-	N8			-	LKC
VFJZ20	-	100	-	M8	-	N8	-	SC10	-	FC10-A8

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. L dimensions can be specified in 0.1mm increment for LKC. L≤200···L±0.03
	FC	Set Screw Flat at One Location Ordering Code FC10-A8 FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or A≥2 Not available in combination with WFC. D 6~18: h 1; D 20~30: h 2
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E2 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D 6~18: h 1; D 20~30: h 2

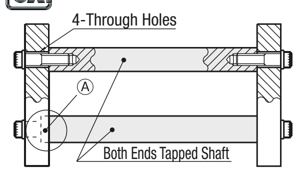
Alterations	Code	Spec.
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Applicable to D=6 or more SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D/W/ℓ1: 6/5/8, 8/7/8, 10/8/8, 12/10/10, 13/11/10, 15/13/10, 16/14/10, 18/16/10, 20/17/10, 25/22/10, 30/27/10
	MSC NSC	Change to Fine Tapped Thread Ordering Code MSC14 (M is changed to MSC) NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more For details, see Shaft Alteration Guide. P.113
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=10~30, M(N)=6~20 One End Tapped: MDx3.5+4≥L Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
Alterations may lower hardness. See P.112

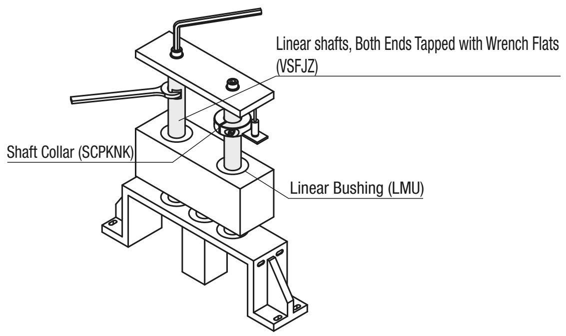
Part Number: Type	D	Unit Price: Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 450
VFJW	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VSFJW	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VPFJW	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VPSFJW	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VRJW	4				-	-
	5					-
	6					-
	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 ~ 450
VFJZ	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VSFJZ	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VPFJZ	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VPSFJZ	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VRJZ	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					

Example



•Precision Type does not require stepped machining as Ⓐ, which enables effective assembly.



High Precision Linear Shafts

One End Tapped / One End Tapped with Wrench Flats

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

Annealing required for wrench flats machining and shaft end threading (effective thread length + approx. 10mm) may lower hardness. P.112

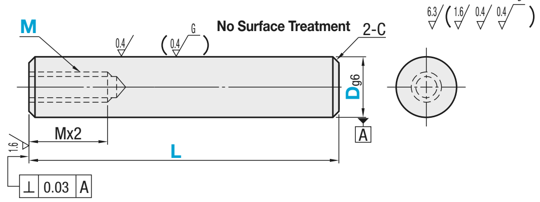
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

There will be centering holes on end faces of the shafts.

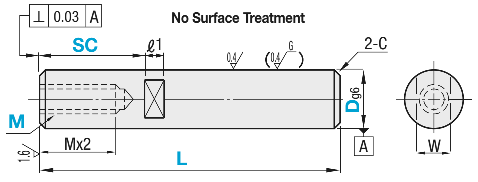
Features of LTBC Plating P.128

Type			M Material	H Hardness		S Surface Treatment
W/o Wrench Flats	With Wrench Flats	D Tol.				
VFJT	VFJC	g6	EN 1.3505 Equiv.	Induction Hardened Effective Hardened Depth P.112		-
VSFJT	VSFJC	g6	EN 1.4125 Equiv.			-
VPFJT	VPFJC	g6	EN 1.3505 Equiv.			-
VPSFJT	VPSFJC	g6	EN 1.3505 Equiv.		58HRC~	Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
			EN 1.4125 Equiv.		56HRC~	
VRJT	VRJC	g6	EN 1.3505 Equiv.			LTBC Plating

W/o Wrench Flats



With Wrench Flats



D Tol.	
D	g6
4	-0.004 -0.012
5	
6	
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

Part Number			L specified in 1mm Increment	M (Coarse), N (Coarse) Selection	Wrench Flats Dimensions			C
Type		D			SC	W	ℓ1	
(W/o Wrench Flats) (D4~D30) VFJT VSFJT VPFJT VPSFJT VRJT	(With Wrench Flats) (D6~D30) VFJC VSFJC VPFJC VPSFJC VRJC	4	25~200	2	-	-	-	0.2 or Less
		5	25~300	2.6 3				
		6	25~300	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	0.5 or Less
		8	25~300	3 4 5		7		
		10	25~350	3 4 5 6		8		
		12	25~350	4 5 6 8		10	10	
		13	25~350	4 5 6 8		11		
		15	25~350	4 5 6 8 10		13		
		16	25~350	4 5 6 8 10		14		
		18	25~350	4 5 6 8 10 12		16		
		20	30~450	4 5 6 8 10 12		17		1.0 or Less
		25	30~450	4 5 6 8 10 12 16		22		
		30	30~450	6 8 10 12 16 20		27	15	

For overall length L, when Mx2.5+4≥L, tap pilot holes may go through.

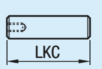
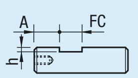
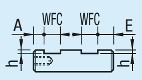
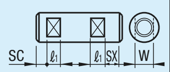
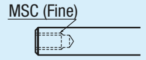
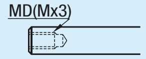
Ordering Example

Part Number	-	L	-	M	-	SC
VFJT20	-	100	-	M8	-	
VFJC20	-	100	-	M8	-	SC10

Alterations

Part Number	-	L	-	M (M4, MD)	-	SC	-	(LKC···etc.)
VFJC20	-	100	-	M8	-	SC10	-	LKC
VFJT20	-	100	-	M8			-	FC10-A8

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. L dimensions can be specified in 0.1mm increment for LKC. L≤200···L±0.03
	FC	Set Screw Flat at One Location Ordering Code FC10-A8 FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 A=0 or A≥2 Not available in combination with WFC. D 6~18: h 1; D 20~30: h 2
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E2 WFC,A,E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D 6~18: h 1; D 20~30: h 2
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Applicable to D=6 or more SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar.
MSC (Fine) 	MSC	Change to Fine Tapped Thread Ordering Code MSC14 (M is changed to MSC) NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more For details, see Shaft Alteration Overview. P.113
MD(Mx3) 	MD	Change the effective length of tapped part to Mx3. Ordering Code MD6 (M is changed to MD) Application Notes Only applicable to D=10~30, M=6~20 One End Tapped: MDx3.5+4≥L

SX dimensions:

D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8		25	22	
12	10	10	30	27	15
13	11				
15	13				
16	14				

Please see Shaft Alteration Overview for details if provided. P.113

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.

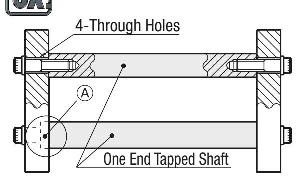
The distance between wrench flats and cross-drilled holes should be greater than 2mm for alterations.

Alterations may lower hardness. See P.112

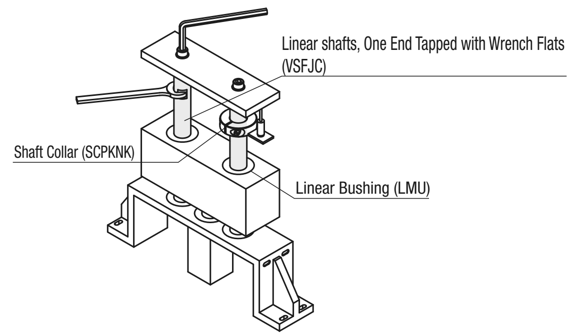
Part Number		Unit Price				
Type	D	Min. L 50	L51 100	L101 200	L201 300	L301 450
VFJT	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VSFJT	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VPFJT	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VPSFJT	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VRJT	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					

Part Number		Unit Price				
Type	D	Min. L 50	L51 100	L101 200	L201 300	L301 450
VFJC	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VSFJC	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VPFJC	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VPSFJC	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					
VRJC	6					-
	8					-
	10					
	12					
	13					
	15, 16					
	18					
	20					
	25					
	30					

Example



•Precision Type does not require stepped machining as Ⓐ, which enables effective assembly.



High Precision Linear Shafts

Both Ends Stepped and Tapped / Both Ends Stepped and Tapped with Wrench Flats

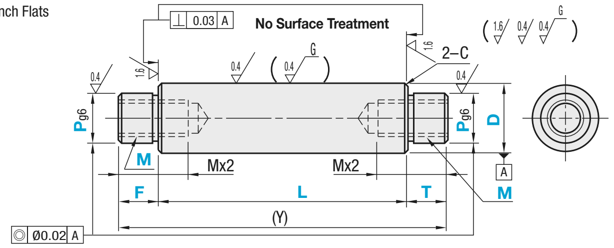
■Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end (⊥ 0.03).

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
Full Length Hardness Guaranteed Shafts P.127
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Features of LTBC Plating P.128

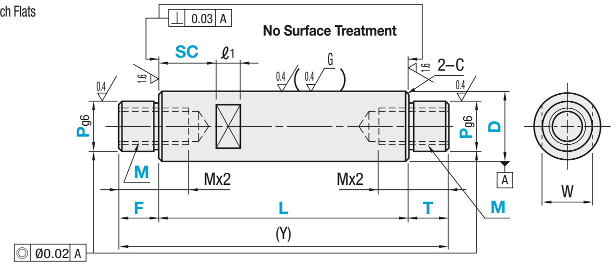
Type		D Tol.	Material	Hardness	Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VFAH	VFPH	g6	EN 1.3505 Equiv.	Induction Hardened Effective Hardened Depth P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSFAH	VSFPH		EN 1.4125 Equiv.		
VPFAH	VPFPH		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSFAH	VPSFPH		EN 1.4125 Equiv.		
VRAH	VRPH		EN 1.3505 Equiv.		LTBC Plating
VSRAH	VSRPH		EN 1.4125 Equiv.		

D Tol.	
D	g6
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number		1mm Increment			M (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C
Type	D	L	F, T	P		SC	W	ℓ1		
(W/o Wrench Flats) VFAH VSFAH VPFAH VPSFAH VRAH VSRAH (With Wrench Flats) VFPH VSFPH VPFPH VPSFPH VRPH VSRPH	8	25~296	2≤F≤Px4 2≤T≤Px4	6	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	300	0.5 or Less
	10	25~346		6~8	3 4 5		8		350	
	12	25~346		6~10	3 4 5 6		10	10	350	
	13	25~346		6~11	3 4 5 6 8		11		350	
	15	25~346		6~13	3 4 5 6 8 10		13		350	
	16	25~346		6~14	3 4 5 6 8 10		14		350	
	18	25~346		8~16	4 5 6 8 10 12		16		350	
	20	25~446		8~17	4 5 6 8 10 12		17		450	1.0 or Less
	25	25~446		8~22	4 5 6 8 10 12 16		22		450	
	30	25~446		9~27	5 6 8 10 12 16 20 24		27	15	450	

P dimensions require M+3≤P. (Y) dimensions require Mx4≤(Y). Tap pilot holes may go through.

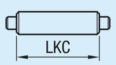
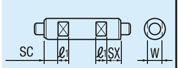
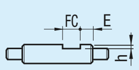
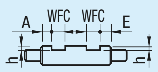
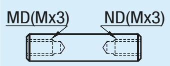
Ordering Example

Part Number	-	L	-	F	-	P	-	M	-	T	-	SC
VFAH20	-	100	-	F20	-	P10	-	M8	-	T20		
VFPH20	-	100	-	F20	-	P10	-	M8	-	T20	-	SC20

Alterations

Part Number	-	L	-	F	-	P	-	M (MD, ND)	-	T	-	SC	-	(LKC···etc)
VFAH20	-	100	-	F20	-	P10	-	M8	-	T20			-	LKC
VFPH20	-	100	-	F20	-	P10	-	M8	-	T20	-	SC20	-	FC10-E8

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. ⊗Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L≤200···L±0.03
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. WSC, X=1mm Increment ⊗Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 ⊗Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 ⊗Orientation between set screw flats is not coplanar. Not available in combination with FC.
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=12~30, M(N)=6~20 One End Tapped: MDx3.5+4≥L Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L

SX:

D	W	ℓ1
8	7	8
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	10
25	22	
30	27	15

FC / WFC:

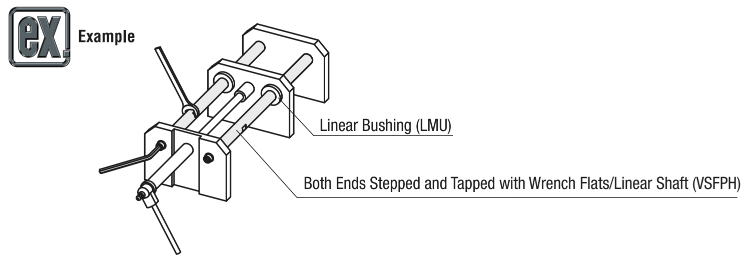
D	h
8~18	1
20~30	2

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 446
VFAH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFAH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFAH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFAH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRAH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSRAH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 446
VFPH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFPH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFPH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFPH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRPH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSRPH	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

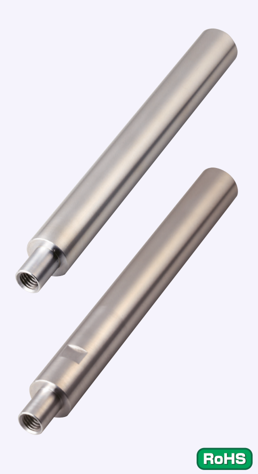
Example



High Precision Linear Shafts

One End Stepped, Both Ends Tapped / One End Stepped, Both Ends Tapped with Wrench Flats

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



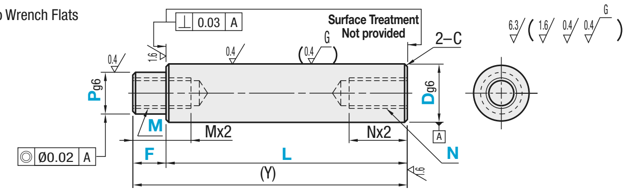
RoHS

- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
- Full Length Hardness Guaranteed Shafts P.127
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

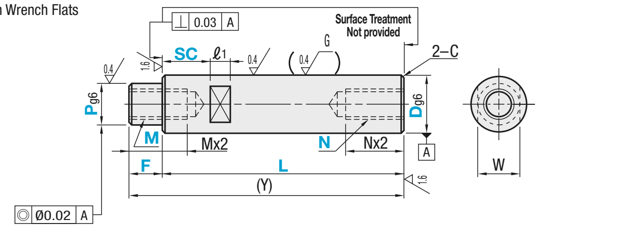
Type		D Tol.	M Material	H Hardness	S Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VFAA	VFPA	g6	EN 1.3505 Equiv.	Induction Hardened Effective Hardened Depth P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSFAA	VSFPA		EN 1.4125 Equiv.		-
VPFAA	VPFPA		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSFAA	VPSFPA		EN 1.4125 Equiv.		Hard Chrome Plating
VRAA	VRPA		EN 1.3505 Equiv.		LTBC Plating
VSRAA	VSRPA		EN 1.4125 Equiv.		LTBC Plating

D Tol.	
D	g6
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number			1mm Increment			M (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C
Type		D	L	F, T	P			SC	W	ℓ1		
(W/o Wrench Flats) VFAA VSFAA VPFAA VPSFAA VRAA VSRAA	(With Wrench Flats) VFPA VSFPA VPFPA VPSFPA VRPA VSRPA	8	25~298	2≤F≤Px4	6	3	3 4 5	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	300	0.5 or Less
		10	25~348		6~8	3 4 5	3 4 5 6		8		350	
		12	25~348		6~10	3 4 5 6	4 5 6 8		10	10	350	
		13	25~348		6~11	3 4 5 6 8	4 5 6 8		11		350	
		15	25~348		6~13	3 4 5 6 8 10	4 5 6 8 10		13		350	
		16	25~348		6~14	3 4 5 6 8 10	4 5 6 8 10		14		350	
		18	25~348		8~16	4 5 6 8 10 12	4 5 6 8 10 12		16		350	
		20	25~448		8~17	4 5 6 8 10 12	4 5 6 8 10 12		17		450	1.0 or Less
		25	25~448		8~22	4 5 6 8 10 12 16	4 5 6 8 10 12 16		22		450	
		30	25~448		9~27	5 6 8 10 12 16 20 24	6 8 10 12 16 20 24		27	15	450	

P dimensions require M+3≤P. (Y) dimensions require Mx2+Nx2≤(Y). Tap pilot holes may go through.

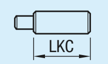
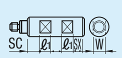
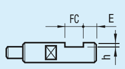
Ordering Example

Part Number	-	L	-	F	-	P	-	M	-	N	-	SC
VFAA20	-	100	-	F20	-	P10	-	M8	-	N8		
VFPA20	-	100	-	F20	-	P10	-	M8	-	N8	-	SC20

Alterations

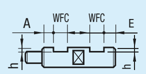
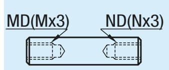
Part Number	-	L	-	F	-	P	-	M(MD)	-	N(ND)	-	SC	-	(LKC···etc)
VFAA20	-	100	-	F20	-	P10	-	M8	-	N8			-	LKC

Alteration Details P.113

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. ⊗Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L≤200 ···›L±0.03
 SC ℓ1 ℓ1 SX W	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 ⊗Orientation between two set screw flats is not coplanar.
 FC E h	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 ⊗Not available in combination with WFC.

D	W	ℓ1	D	W	ℓ1
8	7	8	20	17	10
10	8		25	22	
12	10	10	30	27	15
13	11				
15	13				
16	14				
18	16				

D	h
8~18	1
20~30	2

Alterations	Code	Spec.
 A WFC WFC E h h	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 ⊗Orientation between set screw flats is not coplanar. Not available in combination with FC.
 MD(Mx3) ND(Nx3)	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=10~30, M(N)=6~20 One End Tapped: MDx3.5+4≥L Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L

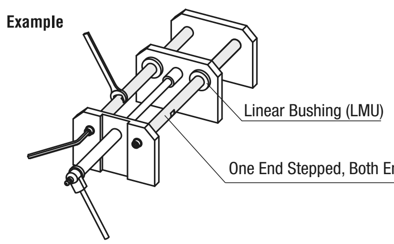
D	h
8~18	1
20~30	2

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
- Alterations may lower hardness. See P.112

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 448
VFAA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFAA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFAA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFAA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRAA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSRAA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 448
VFPA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFPA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFPA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFPA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRPA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSRPA	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Example



High Precision Linear Shafts

One End Stepped and Tapped / One End Stepped and Tapped with Wrench Flats

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

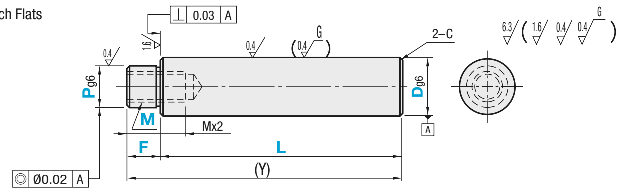
RoHS

- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
- Full Length Hardness Guaranteed Shafts P.127
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

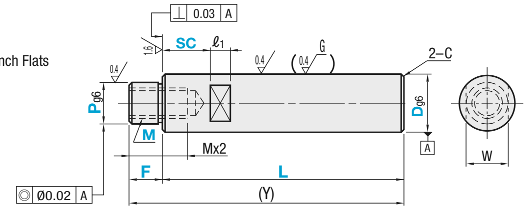
Type W/o Wrench Flats	Type With Wrench Flats	D Tol.	M Material	H Hardness	S Surface Treatment
VFAG	VFPG	g6	EN 1.3505 Equiv.	Induction Hardened Effective Hardened Depth P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSFAG	VSFPG		EN 1.4125 Equiv.		-
VPFAG	VPFPG		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSFAG	VPSFPG		EN 1.4125 Equiv.		
VRAG	VRPG		EN 1.3505 Equiv.		LTBC Plating
VSRAG	VSRPG		EN 1.4125 Equiv.		

D Tol. D	g6
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number Type	D	1mm Increment L	F	P	M (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	C
(W/o Wrench Flats) VFAG VSFAG VPFAG VPSFAG VRAG VSRAG (With Wrench Flats) VFPG VSFPG VPFPG VPSFPG VRPG VSRPG	8	25~298	2≤F≤Px4	6	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	300	0.5 or Less
	10	25~348		6~8	3 4 5		8		350	
	12	25~348		6~10	3 4 5 6		10	10	350	
	13	25~348		6~11	3 4 5 6 8		11		350	
	15	25~348		6~13	3 4 5 6 8 10		13		350	
	16	25~348		6~14	3 4 5 6 8 10		14		350	
	18	25~348		8~16	4 5 6 8 10 12		16		350	
	20	25~448		8~17	4 5 6 8 10 12		17		450	1.0 or Less
	25	25~448		8~22	4 5 6 8 10 12 16		22		450	
	30	25~448		9~27	5 6 8 10 12 16 20 24		27	15	450	

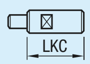
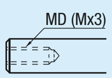
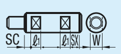
P dimensions require M+3≤P. (Y) dimensions require Mx4≤(Y). When Mx2.5+4≥Y, tap pilot holes may go through.

Ordering Example

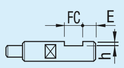
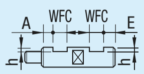
Part Number	-	L	-	F	-	P	-	M	-	SC
VFAG20	-	100	-	F20	-	P10	-	M8	-	
VFPG20	-	100	-	F20	-	P10	-	M8	-	SC20

Alterations

Part Number	-	L	-	F	-	P	-	M (MD)	-	SC	(LKC···etc.)
VFAG20	-	100	-	F20	-	P10	-	M8	-		LKC

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. ⊗Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L≤200 ···›L±0.03
 MD (Mx3)	MD	Change the effective length of tapped part to Mx3. Ordering Code MD6 (M is changed to MD) Application Notes Only applicable to D=12~30, M=6~20 One End Tapped: MDx3.5+4≥L
 SC ℓ1 ℓ1 SX W	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 ⊗Orientation between two set screw flats is not coplanar.

D	W	ℓ1	D	W	ℓ1
8	7	8	16	14	10
10	8		18	16	
12	10	10	20	17	
13	11		25	22	
15	13		30	27	15

Alterations	Code	Spec.
 FC E h	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 ⊗Not available in combination with WFC.
 A WFC WFC E h h	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 ⊗Orientation between set screw flats is not coplanar. Not available in combination with FC.

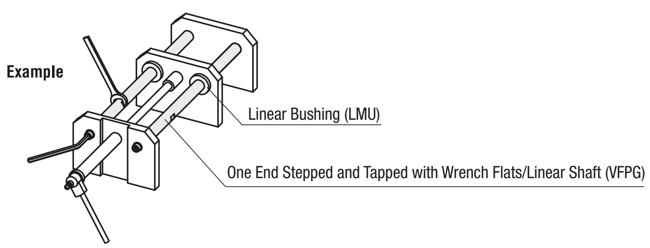
D	h
8~18	1
30	2

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
- Alterations may lower hardness. See P.112

Part Number Type	D	Unit Price Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 448
VFAG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFAG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFAG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFAG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRAG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSRAG	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 ~ 448
VFPG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFPG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFPG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFPG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRPG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSRPG	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

ex Example



High Precision Linear Shafts

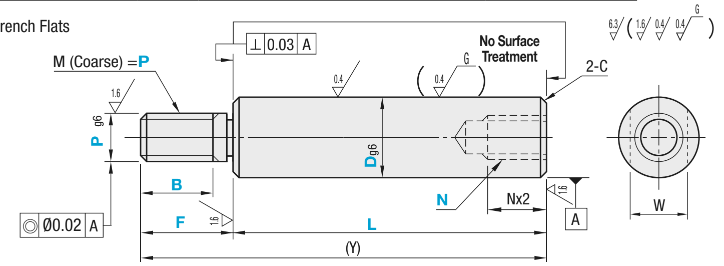
One End Threaded One End Tapped / One End Threaded One End Tapped with Wrench Flats

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

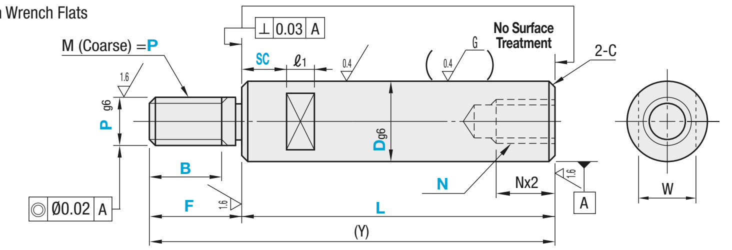
Type		D Tol.	M Material	H Hardness	S Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VFBD	VFAZ	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSFBD	VSFAZ		EN 1.4125 Equiv.		-
VPFBD	VPFAZ		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
VPSFBD	VPSFAZ		EN 1.4125 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
VRBD	VRAZ		EN 1.3505 Equiv.		LTBC Plating

D Tol.	
D	g6
5, 6	-0.004 / -0.012
8, 10	-0.005 / -0.014
12, 13, 15, 16, 18	-0.006 / -0.017
20, 25, 30	-0.007 / -0.020

W/o Wrench Flats



With Wrench Flats



Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

Part Number			1mm Increment			P (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C
Type		D	L	F	B			SC	W	ℓ1		
(W/o Wrench Flats) (D5~30)	(With Wrench Flats) (D6~30)	5	25~296	2≤F≤Px5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 (W/o Threads) B=0 B≥Pitchx3	3	2.6 3	-	-	-	300	0.2 or Less
VFBD	VFAZ	6	25~296			3 4	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	300	
VSFBD	VSFAZ	8	25~296			3 4 5 6	3 4 5		7		300	
VPFBD	VPFAZ	10	25~345			4 5 6 8	3 4 5 6		8		350	
VPSFBD	VPSFAZ	12	25~345			5 6 8 10	4 5 6 8		10	10	350	
VRBD	VRAZ	13	25~345			5 6 8 10	4 5 6 8		11		350	
		15	25~345			5 6 8 10 12	4 5 6 8 10		13		350	
		16	25~345			5 6 8 10 12	4 5 6 8 10		14		350	
		18	25~345			5 6 8 10 12 16	4 5 6 8 10 12		16		350	
		20	25~445			6 8 10 12 16	4 5 6 8 10 12		17		450	
		25	25~445			8 10 12 16 20	4 5 6 8 10 12 16		22		450	
		30	25~445			8 10 12 16 20 24	6 8 10 12 16 20		27	15	450	

Coarse Thread Dimension	
M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0

Overall length L requires Nx3≤L. When D=P, specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimension of the product will be F -(Pitchx2).
Shafts have grinding undercuts at the bottom of threads and centering holes on shaft ends.

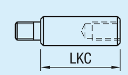
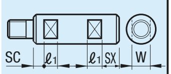
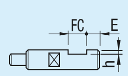
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	N	-	SC
VFAZ16	-	200	-	F20	-	B12	-	P10	-	N8	-	SC10
VFBD12	-	277	-	F20	-	B12	-	P8	-	N5		

Alterations

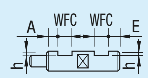
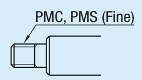
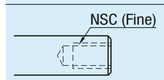
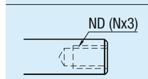
Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	N (NSC, ND)	-	SC	-	(LKC···etc.)
VFAZ16	-	200	-	F20	-	B12	-	P10	-	N8	-	SC10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. L≤200 ···→L±0.03
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Applicable to Shafts with Wrench Flats only. Applicable to D=6 or more. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Only applicable to Shafts with Wrench Flats. Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC.

D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8		25	22	
12	10	10	30	27	15
13	11				
15	13				
16	14				

D	h
8~18	1
30	2

Alterations	Code	Spec.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC.
	PMC PMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMS)
	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	ND	Change the effective length of tapped part to Nx3. Ordering Code ND6 (N is changed to ND) Application Notes Only applicable to D=10~30, N=6~20 One End Tapped: NDx3.5+4≥L

D	h
8~18	1
30	2

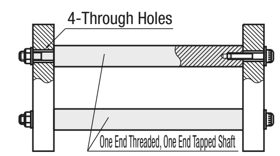
For details, see Shaft Alteration Overview. P.113

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 445
VFBD	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFBD	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFBD	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFBD	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRBD	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 445
VFAZ	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFAZ	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFAZ	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFAZ	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRAZ	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

ex Example



(VFBD)

High Precision Linear Shafts

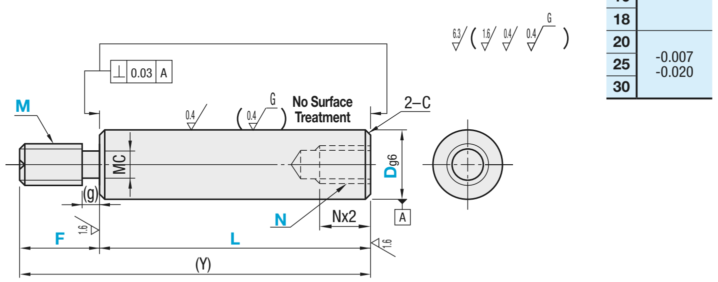
One End Threaded One End Tapped with Undercut / One End Threaded One End Tapped with Undercut and Wrench Flats

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

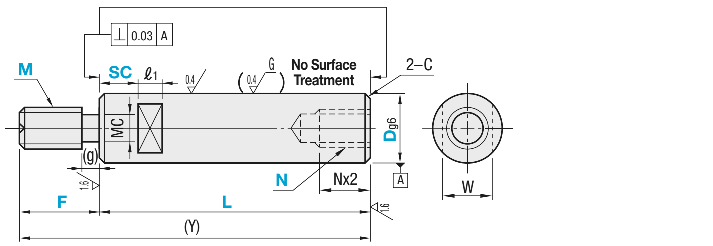
Type		D Tol.	M Material	H Hardness	S Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VAFD	VAFZ	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSAFD	VSAFZ		EN 1.4125 Equiv.		-
VPAFD	VPAFZ		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSAFD	VPSAFZ		EN 1.4125 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VRFD	VRFZ		EN 1.3505 Equiv.		LTBC Plating

D Tol.	
D	g6
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Annealing may lower hardness at shaft end machined areas (effective thread length+approx.10mm). P.112

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

Part Number		1mm Increment		M (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C
Type	D	L	F			SC	W	ℓ1		
(W/o Wrench Flats) VAFD VSAFD VPAFD VPSAFD VRFD (With Wrench Flats) VAFZ VSAFZ VPAFZ VPSAFZ VRFZ	8	25~295	5≤F≤Mx3 F-g≥Pitchx3	6	3 4 5	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	300	0.2 or Less
	10	25~345		6 8	3 4 5 6		8		350	
	12	25~345		6 8 10	4 5 6 8		10	10	350	
	13	25~345		6 8 10	4 5 6 8		11		350	
	15	25~345		6 8 10 12	4 5 6 8 10		13		350	
	16	25~345		6 8 10 12	4 5 6 8 10		14		350	
	18	25~345		6 8 10 12 16	4 5 6 8 10 12		16		350	
	20	25~445		6 8 10 12 16	4 5 6 8 10 12		17		450	
	25	25~445		8 10 12 16 20	4 5 6 8 10 12 16		22		450	
	30	25~445		8 10 12 16 20 24	6 8 10 12 16 20		27	15	450	

Coarse Thread Undercut Dimension			
M	Pitch	MC	(g)
6	1.0	4.2	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

Overall length L requires Nx3≤L. Shafts have grinding undercuts at the bottom of threads and centering holes on shaft ends.

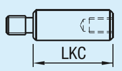
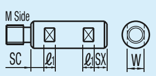
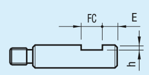
Ordering Example

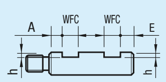
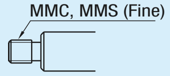
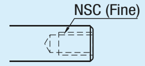
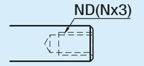
Part Number	-	L	-	F	-	M	-	N	-	SC
VPAFD20	-	300	-	F25	-	M16	-	N12		

Alterations

Part Number	-	L	-	F	-	M (MMC, MMS)	-	N (NSC, ND)	-	SC	-	(LKC···etc.)
VAFZ30	-	250	-	F40	-	M20	-	N20	-	SC10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC ⊗Not applicable when D-M≤2. L dimensions can be specified in 0.1mm increment for LKC. L≤200 ···›L±0.03
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 ⊗Orientation between two set screw flats is not coplanar. D / W / ℓ1: 8 / 7 / 8; 10 / 8 / 8; 12 / 10 / 10; 13 / 11 / 10; 15 / 13 / 10; 16 / 14 / 10; 18 / 16 / 10; 20 / 17 / 10; 25 / 22 / 10; 30 / 27 / 15
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 Application Notes FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 ⊗Not available in combination with WFC. D / h: 8~18 / 1; 20~30 / 2

Alterations	Code	Spec.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 Application Notes WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 ⊗Orientation between set screw flats is not coplanar. Not available in combination with FC. D / h: 8~18 / 1; 20~30 / 2
MMC, MMS (Fine) 	MMC MMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS) For details, see Shaft Alteration Overview. P.113
NSC (Fine) 	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
ND(Nx3) 	ND	Change the effective length of tapped part to Nx3. Ordering Code ND6 (N is changed to ND) Application Notes Only applicable to D=10~30, N=6~20 One End Tapped: MDx3.5+4≥L

Please see Shaft Alteration Overview for details if provided. P.113

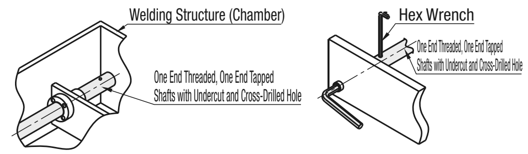
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.

Alterations may lower hardness. See P.112

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 445
VAFD	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSAFD	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPAFD	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSAFD	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRFD	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51 ~ 100	L101 ~ 200	L201 ~ 300	L301 ~ 445
VAFZ	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSAFZ	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPAFZ	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSAFZ	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRFZ	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

ex Example



• Shafts with Cross-Drilled Hole are suitable for narrow work space.

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

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

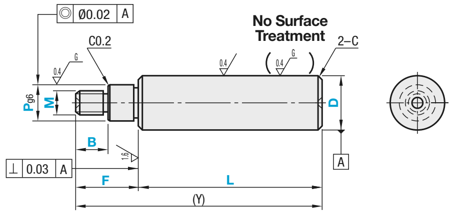
■Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end (⊥ 0.03).

Annealing required for wrench flats machining and shaft end threading (effective thread length + approx. 10mm) may lower hardness. P.112
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
There will be centering holes on end faces of the shafts.
Features of LTBC Plating P.128

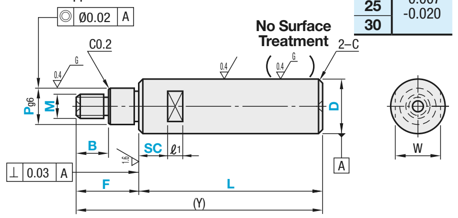
Type						D Tol.	Material	Hardness	Surface Treatment
One End Stepped and Threaded		Both Ends Stepped and Threaded		One End Stepped and Threaded One End Tapped					
W/o Wrench Flats	With Wrench Flats	W/o Wrench Flats	With Wrench Flats	W/o Wrench Flats	With Wrench Flats				
VFAN	VFPN	VFAM	VFPM	VFAD	VFPD	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSFAN	VSFPN	VSFAM	VSFPM	VSFAD	VSFPD		EN 1.4125 Equiv.		
VRAN	VRPN	VRAM	VRPM	VRAD	VRPD		EN 1.3505 Equiv.		LTBC Plating
VSRAN	VSRPN	VSRAM	VSRPM	VSRAD	VSRPD		EN 1.4125 Equiv.		

D Tol.	
	Dg6
4	-0.004 -0.012
5	
6	
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

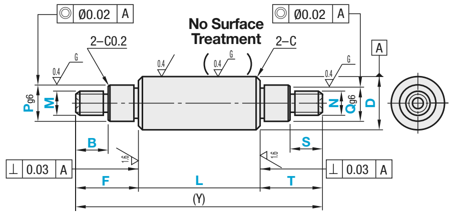
One End Stepped and Threaded



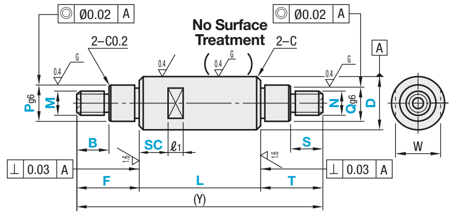
One End Stepped and Threaded with Wrench Flats



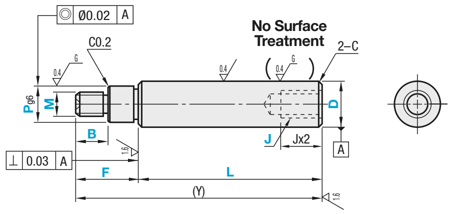
Both Ends Stepped and Threaded



Both Ends Stepped and Threaded with Wrench Flats

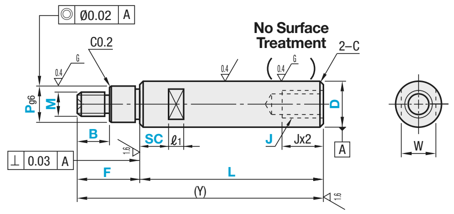


One End Stepped and Threaded One End Tapped



The inside of taps won't be surface treated.

One End Stepped and Threaded One End Tapped with Wrench Flats



The inside of taps won't be surface treated.

Part Number Type (W/o Wrench Flats)	Part Number Type (With Wrench Flats)	D	1mm Increment L	F, T	B, S	P, Q	M, N (Coarse) Selection	J (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	C
VFAN VSFAN VRAN VSRAN	VFPN VSFPN VRPN VSRPN	(4)	25~195	5≤F≤Px5 5≤T≤Nx5	(W/o Threads) B=0 S=0 Mx1≤B≤Mx3 Nx1≤S≤Nx3	M<P<D N<Q<D	3	2	-	-	-	200	0.2 or Less
		(5)	25~295				3 4	2.6 3	-	-	-	300	
		6	25~295				3 4 5	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	300	0.5 or Less
		8	25~295				3 4 5 6	3 4 5		7		300	
		10	25~345				4 5 6 8	3 4 5 6		8		350	
VFAM VSFAM VRAM VSRAM	VFPM VSFPM VRPM VSRPM	12	25~345				5 6 8 10	4 5 6 8		10	10	350	
		13	25~345				5 6 8 10	4 5 6 8		11		350	
		15	25~345				5 6 8 10 12	4 5 6 8 10		13		350	
		16	25~345				5 6 8 10 12	4 5 6 8 10		14		350	
VFAD VSFAD VRAD VSRAD	VFPD VSFPD VRPD VSRPD	18	25~345				5 6 8 10 12	4 5 6 8 10 12		16		350	
		20	25~445				6 8 10 12 16	4 5 6 8 10 12		17		450	1.0 or Less
		25	25~445				8 10 12 16 20	4 5 6 8 10 12 16		22		450	
		30	25~445				8 10 12 16 20 24	6 8 10 12 16 20		27	15	450	

For VFAD, VRAD, VSFAD, VSRAD, VFPD, VSFPD, VRPD and VSRPD, overall length L requires Jx3≤L. F-B(T-S)≥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
VFPM12	-	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 / VRAN (Price on right + Price in the table below) / VFPN (Applicable to D≥6) / VRPN (Applicable to D≥6)	4				-	-
	5					-
	6					-
	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
VSFAN / VSRAN (Price on right + price in the table below) / VSFPN (Applicable to D≥6) / VSRPN (Applicable to D≥6)	4				-	-
	5					-
	6					-
	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 / VRAM (Price on right + Price in the table below) / VFPM (Applicable to D≥6) / VRPM (Applicable to D≥6)	4				-	-
	5					-
	6					-
	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 / VSRAM (Price on right + price in the table below) / VSFPM (Applicable to D≥6) / VSRPM (Applicable to D≥6)	4				-	-
	5					-
	6					-
	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 / VRAD (Price on right + Price in the table below) / VFPD (Applicable to D≥6) / VRPD (Applicable to D≥6)	4				-	-
	5					-
	6					-
	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 / VSRAD (Price on right + price in the table below) / VSFPD (Applicable to D≥6) / VSRPD (Applicable to D≥6)	4				-	-
	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

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

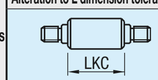
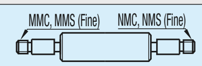
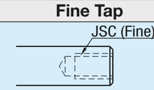
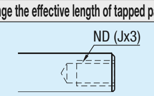
LTBC Plating Additional Charge	D	Additional Price Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
	4~6					-
	8, 10					
	12, 13					
	15, 16					

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

Features of LTBC Plating P.128

Alterations

Part Number	-	L	-	F	-	B	-	P	-	M (MMC, MMS)	-	T, J (JSC)	-	S	-	Q	-	N (NMC, NMS)	-	SC	-	(LKC)
VFAM13	-	300	-	F30	-	B20	-	P10	-	M8	-	T20	-	S10	-	Q10	-	NMC6				

Alterations	Alteration to L dimension tolerance	Fine Thread	Fine Tap	Change the effective length of tapped part to Jx3.
				
Code	LKC	MMC, MMS, NMC, NMS	JSC	ND
Spec.	Changes L tolerance. Ordering Code LKC. Applicable to L dimension 200 or less.···±0.03. L dimensions can be specified in 0.1mm increment for LKC. ⊗Not applicable when D-P(Q)≤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	Changes tapped threads to fine tapped threads shown in the table below. Ordering Code JSC14	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≥L

Fine Thread (MMC, MMS, NMC, NMS):

D	MMC, NMC								MMS, 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		
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).

Fine Tap (JSC):

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
Pitch	1.0	1.25	1.5		

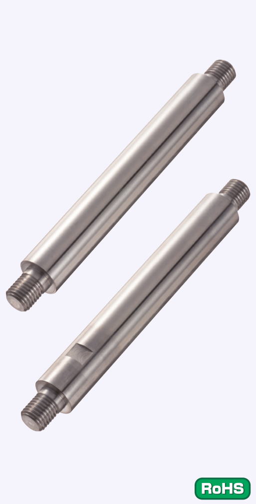
Specify J dimensions with JSC.
J dimension is equal to JSC.
Only applicable to V□AD, VS□AD, V□PD and VS□PD.

The distance between wrench flats and alteration areas should be greater than 2mm for alterations. P.114
Alterations may lower hardness. See P.112

High Precision Linear Shafts

Both Ends Threaded / Both Ends Threaded with Wrench Flats

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



Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112

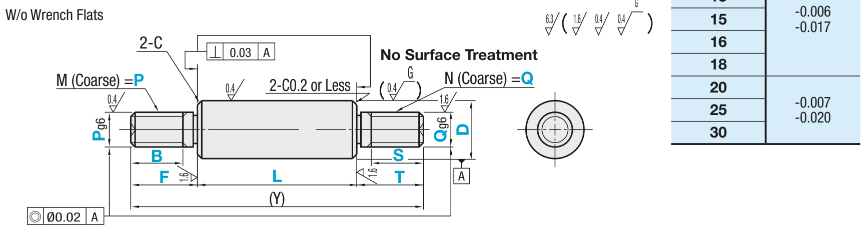
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

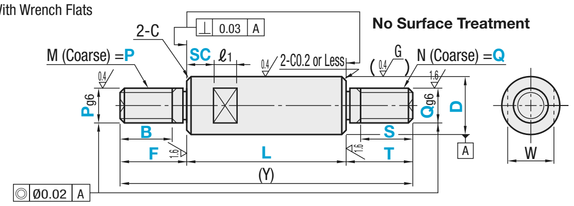
Type		D Tolerance	Material	Hardness	Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VFBM	VFBU	g6	EN 1.3505 Equiv.	Induction Hardened Effective Hardened Depth P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSFBM	VSFBU	g6	EN 1.4125 Equiv.		-
VPFBM	VPFBU	g6	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSFBM	VPSFBU	g6	EN 1.4125 Equiv.		
VRBM	VRBU	g6	EN 1.3505 Equiv.		LTBC Plating

D Tol.	
D	g6
5	-0.004 -0.012
6	
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number Type	D	L (1mm Increment)	F, T (1mm Increment)	B, S (1mm Increment)	P, Q Selection	SC (Wrench Flats Dimensions)	W	ℓ1	(Y) Max.	C
(W/o Wrench Flats) (D5~30): VFBM, VSFBM, VPFBM, VPSFBM, VRBM (With Wrench Flats) (D6~30): VFBU, VSFBU, VPFBU, VPSFBU, VRBU	5	25~292	2≤F≤Px5 2≤T≤Qx5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 (When Q≤6) S≤T-2 (When Q=8, 10) S≤T-3 (When Q≥12) S≤T-5 (W/o Threads) B=0 S=0 B, S≥Pitchx3	3	-	-	-	300	0.2 or Less
	6	25~292			3 4	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	300	
	8	25~292			3 4 5 6		7	8	300	
	10	25~340			4 5 6 8		8	8	350	
	12	25~340			5 6 8 10		10	10	350	
	13	25~340			5 6 8 10		11	10	350	
	15	25~340			5 6 8 10 12		13	10	350	
	16	25~340			5 6 8 10 12		14	10	350	
	18	25~340			5 6 8 10 12 16		16	10	350	
	20	25~440			6 8 10 12 16		17	10	450	
	25	25~440			8 10 12 16 20		22	10	450	
	30	25~440			8 10 12 16 20 24		27	15	450	

Coarse Thread Dimension	
M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0

Shafts have grinding undercuts at the bottom of threads and centering holes on shaft ends. Thread machining will not be applied to B=0 or S=0. D>P(Q)

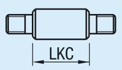
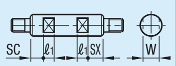
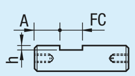
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	T	-	S	-	Q	-	SC
VFBU15	-	200	-	F28	-	B16	-	P6	-	T17	-	S12	-	Q12	-	SC8

Alterations

Part Number	-	L	-	F	-	B	-	P (PMC, PMS)	-	T	-	S	-	Q (QMC, QMS)	-	SC	-	(LKC···etc.)
VSFBU30	-	300	-	F40	-	B30	-	P20	-	T50	-	S40	-	Q16	-	SC10		LKC

Alteration Details P.113

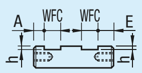
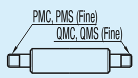
Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC ⊗Not applicable when D-P(Q)≤2. L dimensions can be specified in 0.1mm increment for LKC. L≤200 ···→L±0.03
 SC ℓ1 ℓ1 SX W	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes D=6 or more Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 ⊗Orientation between two set screw flats is not coplanar.
 A FC h	FC	Set Screw Flat at One Location Ordering Code FC10-A8 Application Notes FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 A=0 or A≥2 ⊗ Not available in combination with WFC.

SX table:

D	W	ℓ1
6	5	8
8	7	8
10	8	8
12	10	10
13	11	10
15	13	10
16	14	10
18	16	10
20	17	10
25	22	10
30	27	15

FC table:

D	h
5~18	1
20~30	2

Alterations	Code	Spec.
 A WFC WFC E h h	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E2 Application Notes WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 ⊗Orientation between set screw flats is not coplanar. Not available in combination with FC.
 PMC, PMS (Fine) QMC, QMS (Fine)	PMC PMS QMC QMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMC) QMC14 (Q is changed to QMC) QMS14 (Q is changed to QMS) For details, see Shaft Alteration Overview. P.113

WFC table:

D	h
5~18	1
20~30	2

Please see Shaft Alteration Overview for details if provided. P.113

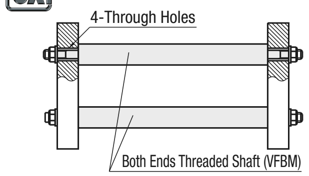
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114

Alterations may lower hardness. See P.112

Part Number Type	D	Unit Price Min. L 50	L51~100	L101~200	L201~300	L301~440
VFBM	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFBM	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFBM	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFBM	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRBM	5					-
	6					-
	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
VFBU	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFBU	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFBU	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFBU	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRBU	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

ex Example



High Precision Linear Shafts

Both Ends Threaded with Undercuts / Both Ends Threaded with Undercuts and Wrench Flats

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

RoHS

Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

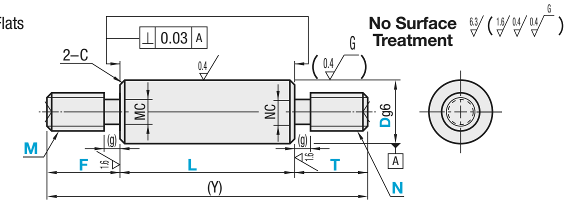
Features of LTBC Plating P.128

Type W/o Wrench Flats	Type With Wrench Flats	D Tol.	M Material	H Hardness	S Surface Treatment
VAFM	VAFU	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
VSAFM	VSAFU		EN 1.4125 Equiv.		
VPAFM	VPAFU		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
VPSAFM	VPSAFU		EN 1.4125 Equiv.	EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	
VRFM	VRFU		EN 1.3505 Equiv.		LTBC Plating

D	D Tol. g6
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

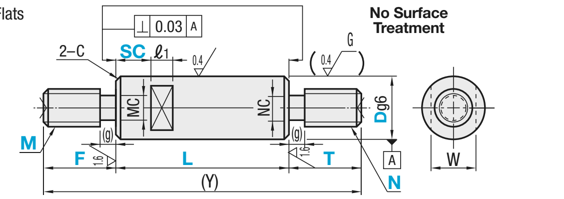
W/o Wrench Flats

No Surface Treatment 6.3/ (1.6/ 0.4/ 0.4/ G)



With Wrench Flats

No Surface Treatment



Part Number Type	D	1mm Increment L	F, T	Selection M, N (Coarse)	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	C
(W/o Wrench Flats) VAFM VSAFM VPAFM VPSAFM VRFM (With Wrench Flats) VAFU VSAFU VPAFU VPSAFU VRFU	8	25~290	5≤F≤Mx3 5≤T≤Nx3 F-(g)≥Pitchx3 T-(g)≥Pitchx3	6	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	300	0.2 or Less
	10	25~340		6 8		8		350	
	12	25~340		6 8 10		10	10	350	
	13	25~340		6 8 10		11		350	
	15	25~340		6 8 10 12		13		350	
	16	25~340		6 8 10 12		14		350	
	18	25~340		6 8 10 12 16		16		350	
	20	25~440		6 8 10 12 16		17		450	
	25	25~440		8 10 12 16 20		22		450	
	30	25~440		8 10 12 16 20 24		27	15	450	

There will be centering holes on shaft ends.

Coarse Thread Undercut Dimension

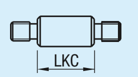
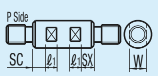
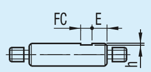
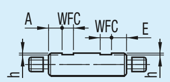
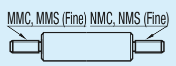
M N	Pitch	MC NC	(g)
6	1.0	4.2	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

Ordering Example

Part Number	-	L	-	F	-	M	-	T	-	N	-	SC
VAFU20	-	200	-	F30	-	M10	-	T20	-	N18	-	SC8

Alterations

Part Number	-	L	-	F	-	M (MMC, MMS)	-	T	-	N (NMC, NMS)	-	SC	-	(LKC···etc.)
VAFU30	-	300	-	F40	-	M20	-	T48	-	N16	-	SC20		LKC

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-M(N)≤2. L dimensions can be specified in 0.1mm increment for LKC. L≤200 ···L±0.03
 P Side, SC, ℓ1, ℓ1, SX, W	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Applicable to Shafts with Wrench Flats only. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D / W / ℓ1: 8 / 7 / 8; 10 / 8 / 8; 12 / 10 / 10; 13 / 11 / 10; 15 / 13 / 10; 16 / 14 / 10; 18 / 16 / 10; 20 / 17 / 10; 25 / 22 / 10; 30 / 27 / 15
 FC, E	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 A=0 or A≥2 Not available in combination with WFC. D / h: 8~18 / 1; 20~30 / 2
 A, WFC, WFC, E	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D / h: 8~18 / 1; 20~30 / 2
 MMC, MMS (Fine) NMC, NMS (Fine)	MMC MMS NMC NMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMSC) NMC14 (N is changed to NMC) NMS14 (N is changed to NMS)

Please see Shaft Alteration Overview for details if provided. P.113

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114

Alterations may lower hardness. P.112

Part Number Type	D	Unit Price Min. L ~ 50	L51~100	L101~200	L201~300	L301~440
VAFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSAFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPAFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSAFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRFM	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
VAFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSAFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPAFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSAFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

High Precision Linear Shafts

One End Threaded / One End Threaded with Wrench Flats

Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end (⊥ 0.03).

Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112

Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.

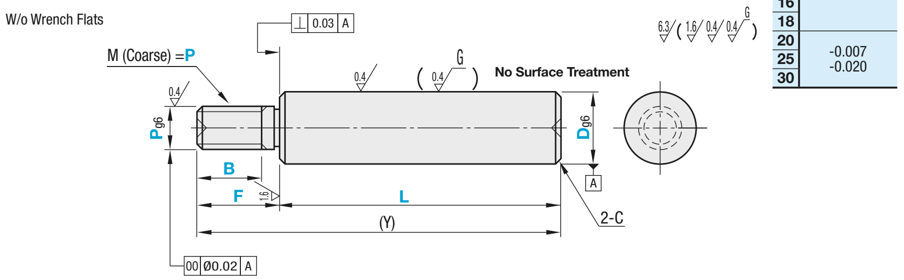
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

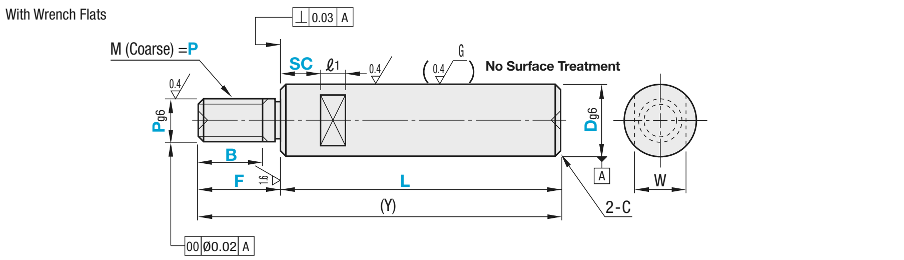
Type		D Tol.	M Material	H Hardness	S Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VFBN	VFBS	g6	EN 1.3505 Equiv.	Induction Hardened Effective Hardened Depth P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSFBN	VSFBS		EN 1.4125 Equiv.		-
VPFBN	VPFBS		EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSFBN	VPSFBS		EN 1.4125 Equiv.		
VRBN	VRBS		EN 1.3505 Equiv.		LTBC Plating

D Tol.	
D	g6
5	-0.004 -0.012
6	
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number Type	D	1mm Increment L	F	B	P Selection	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	C
(W/o Wrench Flats) (D5~D30): VFBN, VSFBN, VPFBN, VPSFBN, VRBN (With Wrench Flats) (D6~D30): VFBS, VSFBS, VPFBS, VPSFBS, VRBS	5	25~296	2≤F≤Px5	(When P≤6) B≤F-2 (when P=8 or 10) B≤F-3 (When P≥12) B≤F-5 B≥Pitchx3	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	-	-	300	0.2 or Less
	6	25~296			3 4		5	8	300	0.5 or Less
	8	25~296			3 4 5 6		7		300	
	10	25~345			4 5 6 8		8		350	
	12	25~345			5 6 8 10		10	10	350	
	13	25~345			5 6 8 10		11		350	
	15	25~345			5 6 8 10 12		13		350	
	16	25~345			5 6 8 10 12		14		350	
	18	25~345			5 6 8 10 12 16		16		350	
	20	25~445			6 8 10 12 16		17		450	1.0 or Less
	25	25~445			8 10 12 16 20		22		450	
	30	25~445			8 10 12 16 20 24		27	15	450	

Coarse Thread Undercut Dimension	
M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0

Shafts have grinding undercuts at the bottom of threads and centering holes on shaft ends.

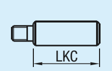
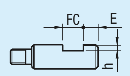
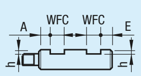
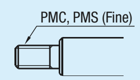
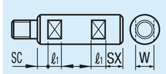
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	SC
VFBS12	-	200	-	F20	-	B15	-	P8	-	SC5

Alterations

Part Number	-	L	-	F	-	B	-	P(PMC, PMS)	-	SC	-	(LKC···etc.)
VFBS30	-	250	-	F40	-	B30	-	P10	-	SC10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. L dimensions can be specified in 0.1mm increment for LKC. L≤200 ····›L±0.03 Not applicable when D-P≤2.
 FC E h	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D 5~18: h 1; D 20~30: h 2
 A WFC WFC E h h	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC,A,E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D 5~18: h 1; D 20~30: h 2
 PMC, PMS (Fine)	PMC PMS	Change to Fine Thread Ordering Code PMC14 (M is changed to PMC.) PMS14 (M is changed to PMS) For details, see Shaft Alteration Overview. P.113
 SC ℓ1 ℓ1 SX W	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Applicable to Shafts with Wrench Flats only. Applicable to D=6 or more. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Only applicable to Shafts with Wrench Flats. Orientation between two set screw flats is not coplanar.

D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
15	13	
16	14	
18	16	
20	17	
25	22	
30	27	15

Please see Shaft Alteration Overview for details if provided. P.113

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114

Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VFBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number Type	D	Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VFBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

High Precision Linear Shafts
One End Threaded with Undercut / Wrench Flats

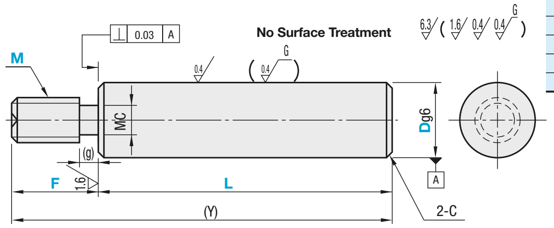
■Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end (⊥ 0.03).

- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

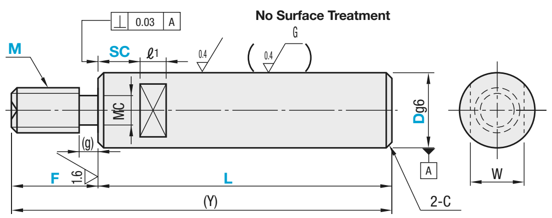
Type: W/o Wrench Flats	Type: With Wrench Flats	D Tol.	M Material	H Hardness	S Surface Treatment
VAFN	VAFS	g6	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
VSAFN	VSAFS	g6	EN 1.4125 Equiv.		-
VPAFN	VPAFS	g6	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSAFN	VPSAFS	g6	EN 1.4125 Equiv.		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VRFN	VRFS	g6	EN 1.3505 Equiv.		LTBC Plating

D Tol. D	g6
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number Type	D	1mm Increment L	F	Selection M (Coarse)	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	C
(W/o Wrench Flats) VAFN, VSAFN, VPAFN, VPSAFN, VRFN (With Wrench Flats) VAFS, VSAFS, VPAFS, VPSAFS, VRFS	8	25~295	5≤F≤Mx3 F-(g)≥Pitchx3	6	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	300	0.5 or Less
	10	25~345		6 8		8	8	350	0.5 or Less
	12	25~345		6 8 10		10	10	350	0.5 or Less
	13	25~345		6 8 10		11	10	350	0.5 or Less
	15	25~345		6 8 10 12		13	10	350	0.5 or Less
	16	25~345		6 8 10 12		14	10	350	0.5 or Less
	18	25~345		6 8 10 12 16		16	10	350	0.5 or Less
	20	25~445		6 8 10 12 16		17	10	450	1.0 or Less
	25	25~445		8 10 12 16 20		22	15	450	1.0 or Less
	30	25~445		8 10 12 16 20 24		27	15	450	1.0 or Less

There will be centering holes on shaft ends.

Coarse Thread Details

M	Pitch	MC	Undercut (g)
6	1.0	4.2	2
8	1.25	6.0	3
10	1.5	7.7	3
12	1.75	9.4	4
16	2.0	13.0	4
20	2.5	16.4	5
24	3.0	19.6	5

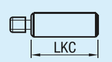
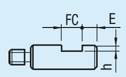
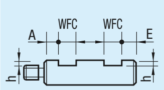
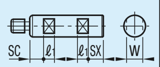
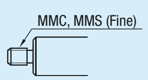
Ordering Example

Part Number	-	L	-	F	-	M	-	SC
VAFS13	-	200	-	F20	-	M10	-	SC10

Alterations

Part Number	-	L	-	F	-	M (MMC, MMS)	-	SC	-	(LKC···etc.)
VAFS30	-	250	-	F20	-	M10	-	SC20	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
 LKC	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 Not applicable when D-M≤2.
 FC, E, h	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D 8~18: h 1; D 20~30: h 2
 A, WFC, WFC, E, h	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC,A,E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D 8~18: h 1; D 20~30: h 2
 SC, ℓ1, ℓ1, SX, W	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. SX=1mmIncrement SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar.
 MMC, MMS (Fine)	MMC MMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS) For details, see Shaft Alteration Overview. P.113

D	W	ℓ1
8	7	8
10	8	8
12	10	10
13	11	10
15	13	10
16	14	10
18	16	10
20	17	10
25	22	10
30	27	15

- Please see Shaft Alteration Overview for details if provided. P.113
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
- Alterations may lower hardness. See P.112

Part Number Type	D	Unit Price Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VAFN	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSAFN	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPAFN	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSAFN	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRFN	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

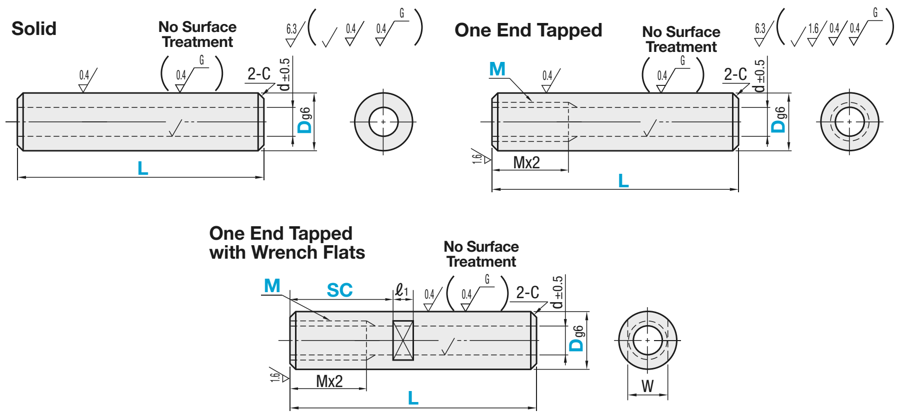
Part Number Type	D	Unit Price Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VAFS	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSAFS	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPAFS	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSAFS	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRFS	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Shafts
Hollow / One End Tapped Hollow / One End Tapped Hollow with Wrench Flats

Features of LTBC Plating P.128
LTBC Plating is not applied to the inside of hollow shafts, taps, bored holes and lateral holes, and may rust.
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
Circularity and O.D. tolerance may not meet precision specification in areas approximately 10mm from wrench flats machined ends.
Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).

Type			M Material	H Hardness	S Surface Treatment
SPJ	SPJT	SPTR	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSPJ	SSPJT	SSPTR	EN 1.4125 Equiv.		-
PSPJ	PSPJT	PSPTR	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
RSPJ	RSPJT	RSPTR	EN 1.3505 Equiv.		LTBC Plating

D Tol.	
6	-0.004 -0.012
8, 10	-0.005 -0.014
12~16	-0.006 -0.017
20~30	-0.007 -0.020
35~50	-0.009 -0.025



About Hollow Shaft Wall Thickness Deviations See P.111

Part Number		D	L specified in 1mm Increment	M (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	d	C
Hollow Shafts	SPJ	6	20~600	3	SC=1mm Increment	5	8	2	0.5 or Less
	SSPJ (* marked sizes only)	*8	20~800(300)	4 *5	When D≤25	7		3(3)	
	PSPJ	*10	20~800(400)	5 *6	SC+ℓ1≤L SC≥Mx2	8		4(4)	
	RSPJ (D≤30,L≤500)	*12	20~1000(500)	*8 *T1 (RC1/8)	When D≥30	10	10	6(5)	
One End Tapped Hollow Shafts	SPJT	*13	25~1000(500)	*10 *T1 (RC1/8)	SC+ℓ1≤L	11		7(5)	
	SSPJT (* marked sizes only)	*16	30~1200(600)	*12 *T2 (RC1/4)	SC≥0	14		10(6)	
	PSPJT	*20	30~1200(800)	*16 *T3 (RC3/8)		17		14(8)	1.0 or Less
	RSPJT (D≤30,L≤500)	*25	35~1200(1000)	*20		22		16(10)	
One End Tapped Hollow Shafts with Wrench Flats	SPTR	*30	35~1500(1000)	*20	Details of Wrench Flats P.112	27	15	17(12)	
	SSPTR (* marked sizes only)	35	35~1500	24		30		19	
	PSPTR	40	50~1500	24 30		36	20	20	
	RSPTR (D≤30,L≤500)	50	60~1500	30		41		26	

When T1, T2 or T3 is selected as M, tapered thread machining is applied. (Ordering Code: MT1)
When Mx2.5+4≥L, tap pilot holes may go through.
Only * marked D and M dimensions are applicable to Stainless Steel Shafts. L and d dimensions in ( ) are applicable.

Ordering Example

Part Number	-	L	-	M	-	SC
SPJ20	-	350				
SPJT20	-	525	-	MT3		
SPTR30	-	730	-	M20	-	SC8

Alterations

Part Number	-	L	-	M	-	SC	-	(DKC···etc.)
SPJ30	-	250					-	DKC
SPJT30	-	250	-	M20			-	WSC12-X8

Alterations may lower hardness. See P.112
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114

Alterations	Revise O.D. Tolerance (Precision Grade)	Alteration to L dimension tolerance	End Boring	Wrench Flats at Two Locations	Lateral Hole on One Side
Code	DKC	LKC	VC, WVC	WSC	RH, LH
Spec.	O.D. tolerance is altered to h5. Ordering Code DKC	Changes L tolerance. Ordering Code LKC L<200···L±0.03 200≤L<500···L±0.05 L≥500···L±0.1 L dimensions can be specified in 0.1mm increment for LKC.	One end or both ends are bored. (Used as pilot holes) Hole diameter V_{H7} is shown in the table below. K=1mm Increment 3<K≤Vx2 Ordering Code One End: VC-K5 Both Ends: WVC-K10	Adds Wrench Flats at two locations. Ordering Code WSC12-X8 WSC, X=1mm Increment When D≤25 WSC+X+ℓ1x2<L WSC≥Mx2,X≥Mx2 When D≥30 WSC+X+ℓ1x2<L WSC≥0 X≥0 Orientation between two wrench flats is not coplanar.	Adds a lateral hole on one side. Lateral hole diameters are shown in the table below. RH, LH=1mm Increment d1+1<RH,LH≤Dx3 Ordering Code One End RH5 Both Ends RH5-LH6 Orientation between two cross-drilled holes is not coplanar.

DKC:

D	h5 Tolerance
6	0 -0.005
8, 10	0 -0.006
12~16	0 -0.008
20~30	0 -0.009
35~50	0 -0.011

Not applicable to Stainless Steel and Low Temp. Chrome Plated Shafts.

VC, WVC:

D	V_{H7}
10	6
12	8
13	10
16	12
20	16
25, 30	20
35, 40	24
50	30

WVC is only applicable for Hollow Shafts.

WSC:

D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
16	14	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

Not applicable to One End Tapped Hollow Shafts.

RH, LH:

D	d_1	D	d_1
10	2 (2)	20	6 (4)
12	3 (2)	25, 30	6 (5)
13	3 (2)	35, 40	8
16	5 (3)	50	10

Values in ( ) are for Stainless Steel Shafts.
The hollow I.D. "d" may vary due to the wall thickness deviations.
Not applicable to tapped end of One End Tapped Type.
Burrs might remain inside after alteration.
Orientation in relation to other features will be random.
Not applicable if interferes with other alterations.

Hollow Shafts

Part Number Type	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1500
SPJ RSPJ Price on right + Price in the table below	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50	-											
SSPJ	8						-	-	-	-	-	-	-
	10							-	-	-	-	-	-
	12								-	-	-	-	-
	13								-	-	-	-	-
	16									-	-	-	-
	20										-	-	-
	25											-	-
	30												-
PSPJ	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50	-											

One End Tapped Hollow Shafts

Part Number Type	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1500
SPJT SPTR RSPJT Price on right + Price in the table below RSPTR	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50	-											
SSPJT SSPTR	8						-	-	-	-	-	-	-
	10							-	-	-	-	-	-
	12								-	-	-	-	-
	13								-	-	-	-	-
	16									-	-	-	-
	20										-	-	-
	25											-	-
	30												-
PSPJT PSPTR	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50	-											

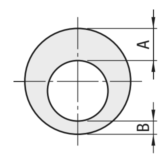
LTBC Plating Additional Charge	D	Additional Price Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
Applicable to RSPJ RSPJT RSPTR	6							
	8							
	10							
	12							
	13							
	16							
	20							
	25							
	30							

For Low Temp. Chrome Plated Shafts, please add LTBC Plating Additional Charge on the left to the non-plated shaft Unit Price above.
Features of LTBC Plating P.128

About Hollow Shaft Wall Thickness Deviations

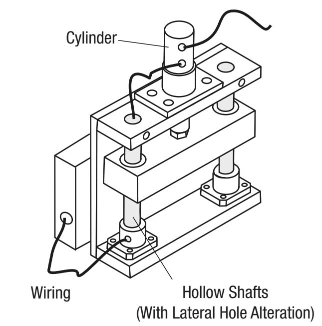
Unit: mm

O.D. (D)	EN 1.3505 Equiv. Wall Thickness Deviation Value	EN 1.4125 Equiv. Wall Thickness Deviation Value
6	0.3 or Less	-
8	0.4 or Less	1.5 or Less
10		4.0 or Less
12		
13		
16		
20		
25	0.6 or Less	
30	1.0 or Less	
35		-
40	1.5 or Less	
50		



Deviation Value = A-B

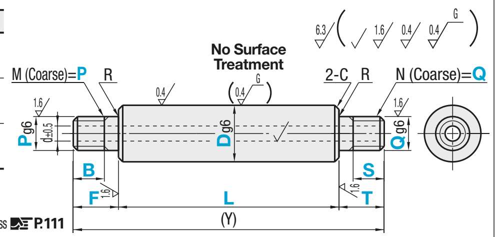
Example



Shafts
Both Ends Threaded Hollow

RoHS

Type	Material	Hardness	Surface Treatment
SPJM	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 58HRC~	-
PSPJM			Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
RSPJM			LTBC Plating



Features of LTBC Plating P.128
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
LTBC Plating is not applied to the inside of hollow shafts, taps, bored holes and lateral holes, and may rust.
Shaft End Machined Area (Effective Thread Length + Approx. 10mm) Annealing may lower hardness.
About Hollow Shaft Wall Thickness Deviations See P.111

Part Number Type	D	Dg6	L (1mm Increment)	F, T (1mm Increment)	B, S (1mm Increment)	P, Q Selection	d	(Y) Max.	R	C
SPJM PSPJM RSPJM (D≤30,L≤500)	6	-0.004 -0.012	25~596	2≤F≤Px5 2≤T≤Qx5	B≤F-2 (When P≤6) B≤F-3 (When P=8, 10) B≤F-5 (When P≥12) B=0 (W/o Threads) S≤T-2 (When Q≤6) S≤T-3 (When Q=8, 10) S≤T-5 (When Q≥12) S=0 (W/o Threads)	6	2	600	0.3 or Less	0.5 or Less
	8	-0.005 -0.014	25~796			8	3	800		
	10		25~796			8 10	4			
	12	-0.006 -0.017	25~996			10 12	6	1000		
	13		25~996			12	7			
	16		25~1196			16	10			
	20	-0.007 -0.020	25~1196			20	14	1200		1.0 or Less
	25		25~1196			24	16			
	30		25~1496			24 30	17			
	35	-0.009 -0.025	25~1496			30	19	1500	0.5 or Less	
	40		25~1496			30	20			

When D=P, or D=Q, specify F=B (T=S) as B (S) dimensions. However, L, F, and T dimensions have manufacturing priority and B (S) dimension of the product will be F (T)-(Pitchx2).
Thread machining will not be applied to B=0 or S=0. B, S≥Pitch x3 is required.

Part Number	-	L	-	F	-	B	-	P	-	T	-	S	-	Q
SPJM20	-	400	-	F20	-	B20	-	P20	-	T20	-	S20	-	Q20

Part Number	-	L	-	F	-	B	-	P	-	T	-	S	-	Q	-	(DKC, LKC⋯etc.)
SPJM30	-	300	-	F40	-	B30	-	P24	-	T50	-	S40	-	Q24	-	DKC

LTBC Plating Additional Charge D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
6							
8							
10							
12							
13							
16							
20							
25							
30							

For LTBC plated Shafts, please add LTBC Plating Additional Charge above to the non-plated shafts Unit Price below.
Features of LTBC Plating P.128

Alterations	Revise O.D. Tolerance (Precision Grade)	Alteration to L dimension tolerance	Wrench Flats	Wrench Flats at Two Locations
Code	DKC	LKC	SC	WSC
Spec.	O.D. tolerance is altered to h5. Ordering Code DKC D 6: h5 Tolerance 0/-0.005; 8, 10: 0/-0.006; 12~16: 0/-0.008; 20~30: 0/-0.009; 35, 40: 0/-0.011 Not applicable to LTBC plated Shafts.	Changes L tolerance. Ordering Code LKC L<200⋯L±0.03 200≤L<500⋯L±0.05 L≥500⋯L±0.1 Not applicable when D-P(Q)≤2 L dimensions can be specified in 0.1mm increment for LKC.	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0 D/W/ℓ1: 6/5/8, 8/7/8, 10/8/8, 12/10/10, 13/11/10, 16/14/10, 20/17/10, 25/22/10, 30/27/15, 35/30/15, 40/36/20	Adds Wrench Flats at two locations. Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC≥0 X≥0 Orientation between two wrench flats is not coplanar. D/W/ℓ1: 6/5/8, 8/7/8, 10/8/8, 12/10/10, 13/11/10, 16/14/10, 20/17/10, 25/22/10, 30/27/15, 35/30/15, 40/36/20

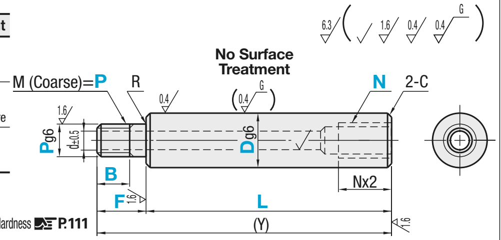
Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1496
SPJM RSPJM Price on right + Price in the table above	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
PSPJM	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												

Shafts
One End Threaded, One End Tapped Hollow

RoHS

Type	Material	Hardness	Surface Treatment
SPJD	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 58HRC~	-
PSPJD			Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
RSPJD			LTBC Plating



Features of LTBC Plating P.128
Circular L standard tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
LTBC Plating is not applied to the inside of hollow shafts, taps, bored holes and lateral holes, and may rust.
Shaft End Machined Area (Effective Thread Length + Approx. 10mm) Annealing may lower hardness.
About Hollow Shaft Wall Thickness Deviations See P.111

Part Number Type	D	Dg6	L (1mm Increment)	F (1mm Increment)	B (1mm Increment)	P Selection	M (Coarse) Selection	d	(Y) Max.	R	C
SPJD PSPJD RSPJD (D≤30,L≤500)	6	-0.004 -0.012	25~598	2≤F≤Px5	B≤F-2 (When P≤6) B≤F-3 (When P=8, 10) B≤F-5 (When P≥12) B=0 (W/o Threads) B≥Pitchx3	6	3	2	600	-	0.5 or Less
	8	-0.005 -0.014	25~798			8	4 5	3	800	0.3 or Less	
	10		25~798			8 10	5 6	4			
	12	-0.006 -0.017	25~998			10 12	8 T1 (RC1/8)	6	1000		
	13		25~998			12	10 T1 (RC1/8)	7			
	16		25~1198			16	12 T2 (RC1/4)	10			
	20	-0.007 -0.020	25~1198			20	16 T3 (RC3/8)	14	1200		1.0 or Less
	25		25~1198			24	20	16			
	30		25~1498			24 30	20	17			
	35	-0.009 -0.025	25~1498			30	24	19	1500	0.5 or Less	
	40		25~1498			30	24 30	20			

When D=P, specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimension of the product will be F - (Pitchx2).
Thread machining will not be applied when B=0 is specified. Overall length L requires Nx3≤L.

Ordering Example Part Number	-	L	-	F	-	B	-	P	-	N
SPJD20	-	277	-	F12	-	B12	-	P20	-	N16

Part Number	-	L	-	F	-	B	-	P	-	N	-	(DKC, LKC, SC⋯etc.)
SPJD30	-	250	-	F40	-	B30	-	P24	-	N20	-	DKC

LTBC Plating Additional Charge D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
6							
8							
10							
12							
13							
16							
20							
25							
30							

For LTBC plated Shafts, please add LTBC Plating Additional Charge above to the non-plated shafts Unit Price below.
Features of LTBC Plating P.128

Alterations	Revise O.D. Tolerance (Precision Grade)	Alteration to L dimension tolerance	Wrench Flats	Wrench Flats at Two Locations
Code	DKC	LKC	SC	WSC
Spec.	O.D. tolerance is altered to h5. Ordering Code DKC D 6: h5 Tolerance 0/-0.005; 8, 10: 0/-0.006; 12~16: 0/-0.008; 20~30: 0/-0.009; 35, 40: 0/-0.011 Not applicable to LTBC plated Shafts.	Changes L tolerance. Ordering Code LKC L<200⋯L±0.03 200≤L<500⋯L±0.05 L≥500⋯L±0.1 Not applicable when D-P≤2. For use of LKC L dimensions can be specified in 0.1mm increment.	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0 When D≤25, SC+ℓ1≤L-Nx2 D/W/ℓ1: 6/5/8, 8/7/8, 10/8/8, 12/10/10, 13/11/10, 16/14/10, 20/17/10, 25/22/10, 30/27/15, 35/30/15, 40/36/20	Adds Wrench Flats at two locations. Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC≥0 When D≤25, X≥Nx2 When D≥30, X≥0 Orientation between two wrench flats is not coplanar. D/W/ℓ1: 6/5/8, 8/7/8, 10/8/8, 12/10/10, 13/11/10, 16/14/10, 20/17/10, 25/22/10, 30/27/15, 35/30/15, 40/36/20

Alterations may lower hardness. See P.112

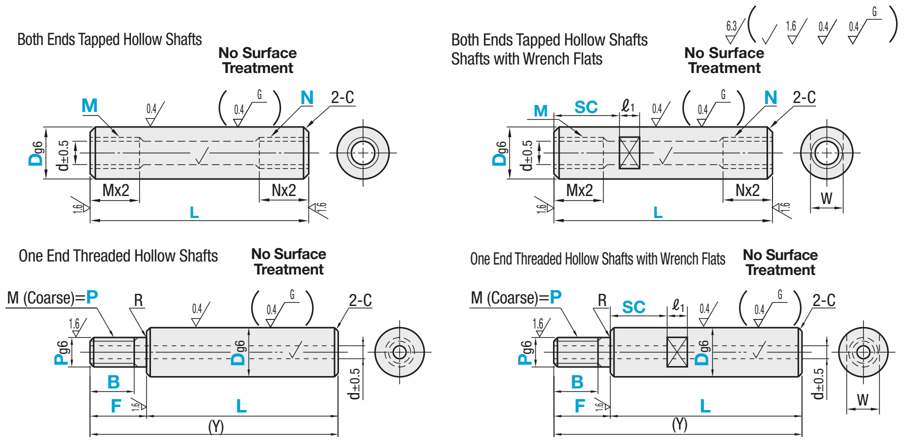
Part Number Type	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1498
SPJD RSPJD Price on right + Price in the table above	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
PSPJD	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												

Shafts

Both Ends Tapped Hollow / Both Ends Tapped Hollow with Wrench Flats / One End Threaded Hollow / One End Threaded Hollow with Wrench Flats

Type				M Material	H Hardness	S Surface Treatment
Both Ends Tapped	Both Ends Tapped with Wrench Flats	One End Threaded	One End Threaded with Wrench Flats			
SPJW	SPWR	SPJN	SPNR	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	-
SSPJW	SSPWR	-	-	EN 1.4125 Equiv.		-
PSPJW	PSPWR	PSPJN	PSPNR	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
RSPJW	RSPWR	RSPJN	RSPNR	EN 1.3505 Equiv.		LTBC Plating

D Tol.	
6	-0.004 -0.012
8, 10	-0.005 -0.014
12~16	-0.006 -0.017
20~30	-0.007 -0.020
35~50	-0.009 -0.025



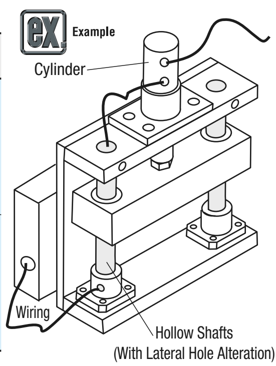
- Features of LTBC Plating P.128
- Circularity and O.D. tolerance may not meet precision specification in areas approximately 15mm from wrench flats machined ends.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- LTBC Plating is not applied to the inside of hollow shafts, taps, bored holes and lateral holes, and may rust.
- Annealing required for wrench flats machining and shaft end threading (effective thread length + approx. 10mm) may lower hardness. P.112

About Hollow Shaft Wall Thickness Deviations See P.111

Both Ends Tapped Hollow Shafts

Part Number Type	D	L specified in 1mm Increment	M (Coarse), N (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ_1	d	C
Not applicable to Both Ends Tapped Hollow Shafts SPJW SSPJW (* marked sizes only) PSPJW RSPJW (D≤30,L≤500) Both Ends Tapped Hollow with Wrench Flats SPWR SSPWR (* marked sizes only) PSPWR RSPWR (D≤30,L≤500)	6	20~600	3	SC=1mm Increment When D≤25, SC+ℓ_1≤L-Nx2, SC≥Mx2 When D≥30, SC+ℓ_1≤L, SC≥0 Details of Wrench Flats P.112	5	8	2	0.5 or Less
	*8	20~800(300)	4 *5		7		3(3)	
	*10	20~800(400)	5 *6		8		4(4)	
	*12	32~1000(500)	*8 *T1 (RC1/8)		10	10	6(5)	
	*13	40~1000(500)	*10 *T1 (RC1/8)		11		7(5)	
	*16	48~1200(600)	*12 *T2 (RC1/4)		14		10(6)	
	*20	64~1200(800)	*16 *T3 (RC3/8)		17		14(8)	1.0 or Less
	*25	80~1200(1000)	*20		22		16(10)	
	*30	80~1500(1000)	*20		27	15	17(12)	
	35	96~1500	24		30		19	
	40	96~1500	24 30		36	20	20	
	50	120~1500	30		41		26	

- When T1, T2 or T3 is selected as M or N, tapered thread machining is applied. (Ordering Code: MT1, NT1)
- L requires Mx2+Nx2≤L.
- When Mx25+4+Nx2.5+4≤L, tap pilot holes may go through.
- When L≤Mx2+Nx2, effective depth of larger diameter tap has priority.
- Only * marked D, M and N dimensions are applicable to Stainless Steel Shafts. L and d dimensions in ( ) are applicable.



One End Threaded Hollow Shafts

Part Number Type	D	L (1mm Increment)	F (1mm Increment)	B (1mm Increment)	P Selection	Wrench Flats Dimensions SC	W	ℓ_1	d	(Y) Max.	R	C
One End Threaded Hollow Shafts SPJN PSPJN RSPJN (D≤30,L≤500) One End Threaded Hollow Shafts with Wrench Flats SPNR PSPNR RSPNR (D≤30,L≤500)	6	25~598	2≤F≤Px5	B≤F-2 (When P=6) B≤F-3 (When P=8, 10) B≤F-5 (When P≥12) B=0 (W/o Threads) B≥Pitchx3	6	SC=1mm Increment SC+ℓ_1≤L SC≥0 Details of Wrench Flats P.112	5	8	2	600	0.3 or Less	0.5 or Less
	8	25~798			8		7		3	800		
	10	25~798			8 10		8		4			
	12	25~998			10 12		10	10	6	1000		
	13	25~998			12		11		7			
	16	25~1198			16		14		10			
	20	25~1198			20		17		14	1200		1.0 or Less
	25	25~1198			24		22		16			
	30	25~1498			24 30		27	15	17	1500		
	35	25~1498			30		30		19		0.5 or Less	
	40	25~1498			30		36	20	20			

- When D=P, specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimension of the product will be F -(Pitchx2).
- Thread machining will not be applied when B=0 is specified.

Ordering Example

• Both Ends Tapped Hollow Shafts

Part Number	-	L	-	M	-	N	-	SC
SPJW20	-	500	-	M16	-	N16		
SPWR30	-	680	-	M20	-	N20	-	SC10

• One End Threaded Hollow Shafts

Part Number	-	L	-	F	-	B	-	P	-	SC
SPJN 20	-	1051	-	F30	-	B30	-	P20		
SPNR 30	-	1270	-	F60	-	B28	-	P24	-	SC5

Part Number Type	D	Unit Price Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1500
SPJW SPWR RSPJW RSPWR	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20	-											-
	25	-											-
	30	-											
	35	-											
	40	-											
	50	-	-										
SSPJW SSPWR	8						-	-	-	-	-	-	-
	10							-	-	-	-	-	-
	12								-	-	-	-	-
	13								-	-	-	-	-
	16									-	-	-	-
	20	-									-	-	-
	25	-										-	-
	30	-										-	-
PSPJW PSPWR	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20	-											-
	25	-											-
	30	-											
	35	-											
	40	-											
	50	-	-										
SPJN SPNR RSPJN Price on right + Price in Table 2 below RSPNR	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
PSPJN PSPNR	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												

(Table 1) LTBC Plating Additional Charge — Suitable for RSPJW RSPWR	D	Additional Price Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
	6							
	8							
	10							
	12							
	13							
	16							
	20							
	25							
	30							

(Table 2) LTBC Plating Additional Charge — Suitable for RSPJN RSPNR	D	Additional Price Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
	6							
	8							
	10							
	12							
	13							
	16							
	20							
	25							
	30							

For LTBC plated Shafts, add LTBC Plating Additional Charge in (Table 1) and (Table 2) to the non-plated shaft Unit Price above.

Alterations

• Both Ends Tapped Hollow Shafts

Part Number	-	L	-	M	-	N	-	SC	-	(DKC etc.)
SPJW30	-	500	-	M20	-	N20			-	WSC12-X8

• One End Threaded Hollow Shafts

Part Number	-	L	-	F	-	B	-	P	-	SC	-	(DKC etc.)
SPJN30	-	250	-	F40	-	B30	-	P24			-	DKC

Alterations	Revise O.D. Tolerance (Precision Grade)	Alteration to L dimension tolerance	One End Bored	Wrench Flats at Two Locations	Lateral Hole on One Side
Code	DKC	LKC	VC	WSC	RH
Spec.	O.D. tolerance is altered to h5. Ordering Code DKC	Changes L tolerance. Ordering Code LKC L<200···L±0.03 200≤L<500···L±0.05 L≥500···L±0.1 L dimensions can be specified in 0.1mm increment for LKC. Not applicable to One End Threaded Type when D-P≤2.	Boring added to right end. (Use as pilots.) Hole diameter VH7 is shown in the table below. K=1mm Increment 3<K≤Vx2 Ordering Code VC-K5	Adds Wrench Flats at two locations. Ordering Code WSC12-X8 WSC, X=1mm Increment When D≤25: WSC+X+ℓ_1x2<L, WSC≥Mx2, X≥Mx2 When D≥30: WSC+X+ℓ_1x2<L, WSC≥0, X≥0 Orientation between two wrench flats is not coplanar.	Adds a lateral hole on one side. Lateral hole diameters are shown in the table below. RH=1mm Increment d_1+1<RH≤Dx3 Ordering Code RH5

DKC:

D	h5 Tolerance
6	0 -0.005
8, 10	0 -0.006
12~16	0 -0.008
20~30	0 -0.009
35~50	0 -0.011

Not applicable to Stainless Steel and Low Temp. Chrome Plated Shafts.

VC:

D	VH7
10	6
12	8
13	10
16	12
20	16
25	20
30	20
35	24
40	24

For Both Ends Tapped Hollow Shafts,

WSC:

D	W	ℓ_1
6	5	8
8	7	
10	8	
12	10	10
13	11	
16	14	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

Applicable to Both Ends Tapped Hollow Shafts only.

RH:

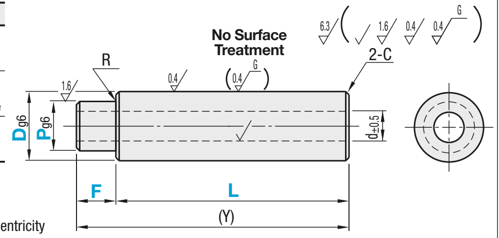
D	d_1	D	d_1
10	2 (2)	20	6 (4)
12	3 (2)	25, 30	6 (5)
13	3 (2)	35, 40	8
16	5 (3)	50	10

Values in ( ) are for Stainless Steel Shafts.
- The hollow I.D. "d" may vary due to the wall thickness deviations.
- Not applicable to threaded side of One End Threaded Shafts.
- Burrs might remain inside after alteration.
- Orientation in relation to other features will be random.
- Not applicable to Both Ends Tapped Shafts.
- Not applicable if interferes with other alterations.

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114 Alterations may lower hardness. See P.112

Shafts
One End Stepped Hollow

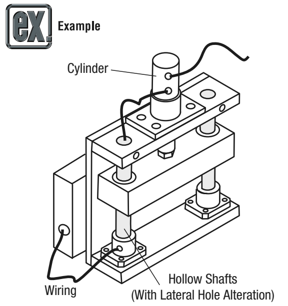
Type	Material	Hardness	Surface Treatment
SPJG	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 58HRC~	-
PSPJG			Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
RSPJG			LTBC Plating



- Features of LTBC Plating P.128
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- LTBC Plating is not applied to the inside of hollow shafts, taps, bored holes and lateral holes, and may rust.
- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).
- About Hollow Shaft Wall Thickness Deviations See P.111

Part Number Type	Dg6		L (1mm Increment)	F (1mm Increment)	P (1mm Increment)	(Y) Max.	d	R	C
SPJG PSPJG RSPJG (D≤30, L≤500)	6	-0.004 -0.012	25~598	2≤F≤Px3	5≤P<D	600	2	0.3 or Less	0.5 or Less
	8	-0.005 -0.014	25~798		6≤P<D	800	3		
	10		25~798		7≤P<D		4		
	12	-0.006 -0.017	25~998		10≤P<D	1000	6		
	13		25~998				7		
	16		25~1198		13≤P<D	1200	10		1.0 or Less
	20	-0.007 -0.020	25~1198		16≤P<D		14		
	25		25~1198		20≤P<D		16		
	30		25~1498		22≤P<D	1500	17		
	35	-0.009 -0.025	25~1498		24≤P<D		19	0.5 or Less	
	40		25~1498		25≤P<D		20		
	50		25~1498		32≤P<D		26		

Example



Ordering Example

Part Number	-	L	-	F	-	P
SPJG20	-	400	-	F25	-	P16

Alterations

Part Number	-	L	-	F	-	P	-	(DKC, etc.)
SPJG30	-	400	-	F25	-	P22	-	VC

- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
- Alterations may lower hardness. See P.112

Alterations	Revise O.D. Tolerance (Precision Grade)	Alteration to L dimension tolerance	Wrench Flats	One End Bored	Lateral Hole on One Side
Code	DKC	LKC	SC	VC	RH
Spec.	O.D. tolerance is altered to h5. Ordering Code DKC D / h5 Tolerance: 6: 0/-0.005; 8, 10: 0/-0.006; 12~16: 0/-0.008; 20~30: 0/-0.009; 35~50: 0/-0.011 Not applicable to LTBC plated Shafts.	Changes L tolerance. Ordering Code LKC L<200 ··· L±0.03 200≤L<500 ··· L±0.05 L≥500 ··· L±0.1 L dimensions can be specified in 0.1mm increment for LKC. Not applicable when D-P≤2.	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0	One end is bored. (Used as a pilot hole) Hole diameter V_{H7} is shown in the table below. K=1mm Increment 3<K<Vx2 Ordering Code VC-K5	Adds a lateral hole on one side. Lateral hole diameters are shown in the table below. RH=1mm Increment d1+1<RH≤Dx3 Ordering Code RH5 The hollow I.D. "d" may vary due to the wall thickness deviations. Not applicable to stepped sides. Burrs might remain inside after alteration. Orientation in relation to other features will be random. Not applicable if interferes with other alterations.

SC (Wrench Flats):

D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
16	14	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

VC (One End Bored):

D	V_{H7}
6	-
8	-
10	6
12	8
13	10
16	12
20	16
25	20
30	20
35	24
40	24
50	30

RH (Lateral Hole on One Side):

D	d1	D	d1
10	2	20	6
12	3	25, 30	6
13	3	35, 40	8
16	5	50	10

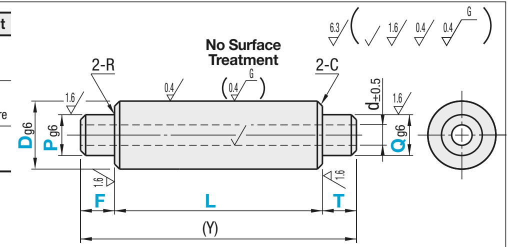
Part Number Type	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1498
SPJG RSPJG Price on right + Price in the table below	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50												
PSPJG	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50												

Low Temp. Black Chrome Plating Additional Charge	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
	6							
	8							
	10							
	12							
	13							
	16							
	20							
	25							
	30							

- For Low Temp. Chrome Plated Shafts, please add LTBC Plating Additional Charge on the left to the non-plated shaft Unit Price above.
- Features of LTBC Plating P.128

Shafts
Both Ends Stepped Hollow

Type	Material	Hardness	Surface Treatment
SPJQ	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 58HRC~	-
PSPJQ			Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
RSPJQ			LTBC Plating



- Features of LTBC Plating P.128
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- LTBC Plating is not applied to the inside of hollow shafts, taps, bored holes and lateral holes, and may rust.
- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm).
- About Hollow Shaft Wall Thickness Deviations See P.111

Part Number Type	Dg6		L (1mm Increment)	F, T (1mm Increment)	P, Q (1mm Increment)	(Y) Max.	d	R	C
SPJQ PSPJQ RSPJQ (D≤30, L≤500)	6	-0.004 -0.012	25~596	2≤F≤Px3 2≤T≤Qx3	5≤P(Q)<D	600	2	0.3 or Less	0.5 or Less
	8	-0.005 -0.014	25~796		6≤P(Q)<D	800	3		
	10		25~796		7≤P(Q)<D	800	4		
	12	-0.006 -0.017	25~996		10≤P(Q)<D	1000	6		
	13		25~996			1000	7		
	16		25~1196		13≤P(Q)<D	1200	10		1.0 or Less
	20	-0.007 -0.020	25~1196		16≤P(Q)<D	1200	14		
	25		25~1196		20≤P(Q)<D	1200	16		
	30		25~1496		22≤P(Q)<D	1500	17		
	35	-0.009 -0.025	25~1496		24≤P(Q)<D	1500	19	0.5 or Less	
	40		25~1496		25≤P(Q)<D	1500	20		
	50		25~1496		32≤P(Q)<D	1500	26		

- Alterations may lower hardness. See P.112

Ordering Example

Part Number	-	L	-	F	-	P	-	T	-	Q
SPJQ20	-	400	-	F25	-	P16	-	T25	-	Q18

Alterations

Part Number	-	L	-	F	-	P	-	T	-	Q	-	(DKC, LKC, SC)
SPJQ20	-	400	-	F25	-	P16	-	T25	-	Q18	-	LKC

Alterations	Revise O.D. Tolerance (Precision Grade)	Alteration to L dimension tolerance	Wrench Flats
Code	DKC	LKC	SC
Spec.	O.D. tolerance is altered to h5. Ordering Code DKC D / h5 Tolerance: 6: 0/-0.005; 8, 10: 0/-0.006; 12~16: 0/-0.008; 20~30: 0/-0.009; 35~50: 0/-0.011 Not applicable to LTBC plated Shafts.	Changes L tolerance. Ordering Code LKC L<200 ··· L±0.03 200≤L<500 ··· L±0.05 L≥500 ··· L±0.1 L dimensions can be specified in 0.1mm increment for LKC. Not applicable when D-P(Q)≤2	P Side Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L SC≥0

SC (Wrench Flats):

D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
16	14	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

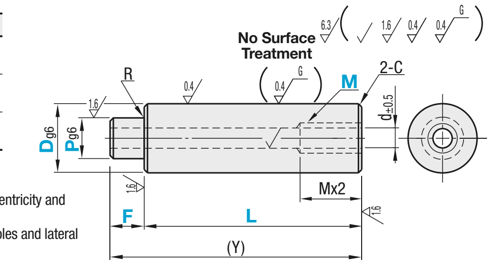
Part Number Type	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1496
SPJQ RSPJQ Price on right + Price in the table below	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50												
PSPJQ	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50												

Low Temp. Black Chrome Plating Additional Charge	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
	6							
	8							
	10							
	12							
	13							
	16							
	20							
	25							
	30							

- For Low Temp. Chrome Plated Shafts, please add LTBC Plating Additional Charge on the left to the non-plated shaft Unit Price above.
- Features of LTBC Plating P.128

Shafts
One End Stepped, One End Tapped Hollow

Type	Material	Hardness	Surface Treatment
SPJA	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 58HRC~	-
PSPJA			Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
RSPJA			LTBC Plating



- Features of LTBC Plating P.128
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- LTBC Plating is not applied to the inside of hollow shafts, taps, bored holes and lateral holes, and may rust.
- Shaft End Machined Area (Effective Thread Length + Approx. 10mm) Annealing may lower hardness.
- About Hollow Shaft Wall Thickness Deviations See P.111

Part Number Type	Dg6		1mm Increment L	F	P	M (Coarse) Selection	(Y) Max.	d	R	C
SPJA PSPJA RSPJA (D≤30,L≤500)	6	-0.004 -0.012	25~598	2≤F≤Px3	5≤P<D	3	600	2	0.3 or Less	0.5 or Less
	8	-0.005 -0.014	25~798		6≤P<D	4 5	800	3		
	10		25~798		7≤P<D	5 6	800	4		
	12	-0.006 -0.017	25~998		10≤P<D	8 T1 (RC1/8)	1000	6		
	13		25~998			10 T1 (RC1/8)	1000	7		
	16		25~1198		13≤P<D	12 T2 (RC1/4)	1200	10		
	20	-0.007 -0.020	25~1198		16≤P<D	16 T3 (RC3/8)	1200	14		1.0 or Less
	25		25~1198		20≤P<D	20	1200	16		
	30		25~1498		22≤P<D	20	1500	17		
	35	-0.009 -0.025	25~1498		24≤P<D	24	1500	19	0.5 or Less	
	40		25~1498		25≤P<D	24 30	1500	20		
	50		25~1498		32≤P<D	30	1500	26		

- When T1, T2 or T3 is selected as M, tapered thread machining is applied. (Ordering Code: MT1)
- Overall length L requires Mx3≤L.

Ordering Example

Part Number	-	L	-	F	-	P	-	M
SPJA20	-	277	-	F25	-	P16	-	M16

Alterations

Part Number	-	L	-	F	-	P	-	M	-	(DKC, LKC, SC)
SPJA20	-	277	-	F25	-	P16	-	M16	-	LKC

Alterations	Revise O.D. Tolerance (Precision Grade)	Alteration to L dimension tolerance	Wrench Flats
Code	DKC	LKC	SC
Spec.	O.D. tolerance is altered to h5. Ordering Code DKC ⊗LTBC Plating	Changes L tolerance. Ordering Code LKC L<200···L±0.03 200≤L<500···L±0.05 L≥500···L±0.1 For use of LKC L dimensions can be specified in 0.1mm increment. ⊗Not applicable when D-P≤2.	Adds wrench flats. Ordering Code SC5 SC=1mm Increment SC+ℓ1≤L-Mx2 SC≥0

D	h5 Tolerance
6	0 -0.005
8, 10	0 -0.006
12~16	0 -0.008
20~30	0 -0.009
35~50	0 -0.011

D	W	ℓ1
6	5	8
8	7	
10	8	
12	10	10
13	11	
16	14	
20	17	
25	22	
30	27	15
35	30	
40	36	20
50	41	

- Alterations may lower hardness. See P.112

Part Number Type	D	Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1498
SPJA RSPJA Price on right + Price in the table below	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50												
PSPJA	6									-	-	-	-
	8										-	-	-
	10										-	-	-
	12											-	-
	13											-	-
	16												-
	20												-
	25												-
	30												
	35												
	40												
	50												

	D	Additional Price Min. L ~ 50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
Low Temp. Black Chrome Plating Additional Charge	6							
	8							
	10							
	12							
	13							
	16							
	20							
	25							
	30							

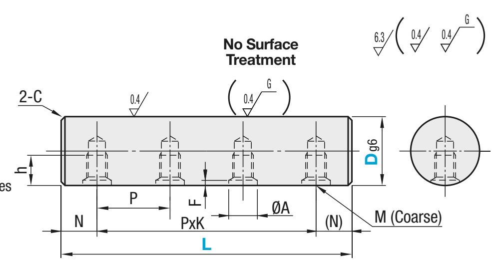
- For Low Temp. Chrome Plated Shafts, please add LTBC Plating Additional Charge on the left to the non-plated shaft Unit Price above.
- Features of LTBC Plating P.128

Shafts
Continuous Support - Pre-Drilled and Tapped

Type	Material	Hardness	Surface Treatment
SFAE	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFAE	EN 1.4125 Equiv.		
PSFAE	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~ EN 1.4125 Equiv. 56HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFAE	EN 1.4125 Equiv.		

$N=\frac{L-PxK}{2}$

K: Number of Pitches



- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Part Number Type	Dg6		L specified in 1mm Increment	M (Coarse)	P	h	C	A	F
SFAE PSFAE	10	-0.005 -0.014	200~ 800	M4	100	4.5	0.5 or Less	4.3	2.0
	12	-0.006 -0.017	200~1000			5			
	13		200~1000			5.5			
SFAE SSFAE PSFAE PSSFAE	16		200~1200	M5	150	Mx2		5.5	
	20	-0.007 -0.020	200~1200	M6			1.0 or Less	6.8	2.5
	25		300~1200		200				
	30		300~1500	M8				9	3.0
	35	-0.009 -0.025	300~1500						
	40		400~1500		300				3.5
	50		400~1500	M10				11	

Ordering Example

Part Number	-	L
SFAE10	-	300

Correlation between L Dimension and Number of Taps

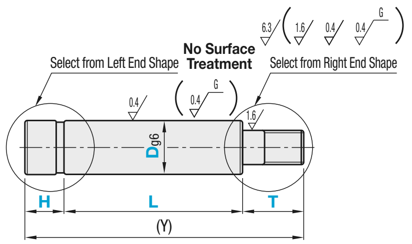
Pitch	P=100	P=150	P=200	P=300	Number of Taps	K (Number of Pitches)	N
L	200~219	200~319	300~419	400~619	2	1	$N=\frac{L-PxK}{2}$
	220~319	320~469	420~619	620~919	3	2	
	320~419	470~619	620~819	920~1219	4	3	
	420~519	620~769	820~1019	1220~	5	4	
	520~619	770~919	1020~1219	-	6	5	
	620~719	920~1069	1220~1419	-	7	6	
	720~819	1070~	1420~	-	8	7	
	820~919	-	-	-	9	8	
	920~	-	-	-	10	9	

Part Number Type	D	L200~300	L301~400	L401~500	L501~600	L601~800	L801~1000	L1001~1200	L1201~1500
SFAE	10						-	-	-
	12							-	-
	13							-	-
	16								-
	20								-
	25								-
	30								
	35								
	40	-							
	50	-							
SSFAE	16								-
	20								-
	25								-
	30								
	35								
	40	-							
	50	-							
PSFAE	10						-	-	-
	12							-	-
	13							-	-
	16								-
	20								-
	25								-
	30								
	35								
	40	-							
	50	-							
PSSFAE	16								-
	20								-
	25								-
	30								
	35								
	40	-							
	50	-							

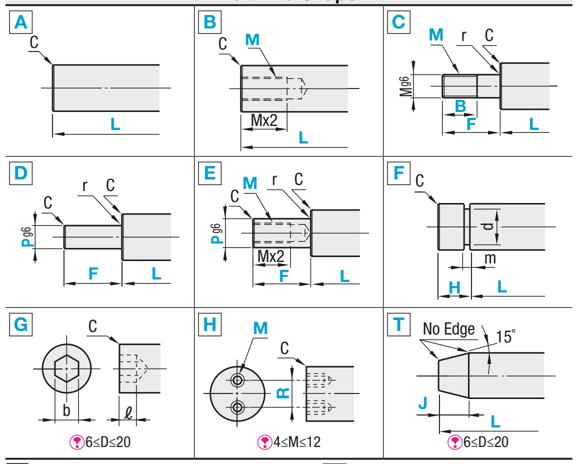
Shafts
Shaft Ends Configurable

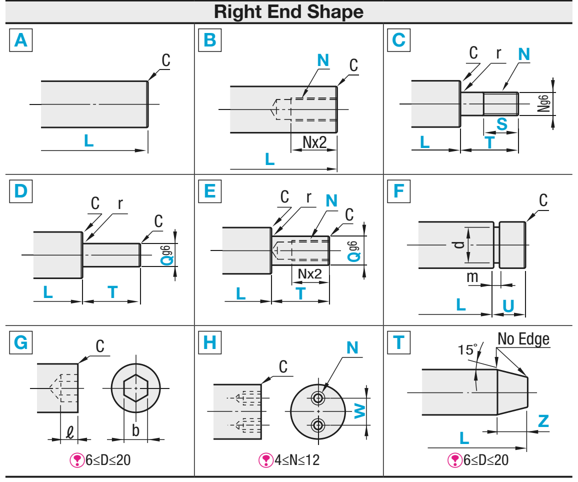
Type		M Material	H Hardness	S Surface Treatment
D Tol. g6	D Tol. h5			
FSFJ	FSFU	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~	-
FSSFJ	FSSFU	EN 1.4125 Equiv.		-
FPSFJ	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
FPSSFJ	-	EN 1.4125 Equiv.	EN 1.4125 Equiv. 56HRC~	

(Y) dimensions need to be (Y)≤Dx50. (Y)≤1500
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111



Left End Shape	Right End Shape





Machining Conditions

A No alteration condition for Shape

B

- When M3 ~ 8 M(N)≤D-3
- When M10 or 12 M(N)≤D-4
- When M16, 20 or 24 M(N)≤D-5
- When M30 M(N)≤D-6

L≥M(N)x4

C

D	r
6~30	0.3 or Less
31~50	0.5 or Less

Specify M(N) dimensions.
B, S≥Pitchx3 is required.

D

D	r
6~30	0.3 or Less
31~50	0.5 or Less

E

D	r
6~30	0.3 or Less
31~50	0.5 or Less

P(Q)≥M(N)+3

- When M3 ~ 8 M(N)≤P(Q)-3
- When M10 or 12 M(N)≤P(Q)-4
- When M16, 20 or 24 M(N)≤P(Q)-5
- When M30 M(N)≤P(Q)-6

F

D dimensions 31 and 38 can not be specified.

G

D	b	Hex Socket Depth ℓ
6, 7	2.5	3.5
8, 9	3	4.5
10	4	6
12~15	5	7.5
16~19	6	9
20	8	12

H

D≥16
D≥M+4+R
D≥N+4+W Tap Depth
R≥M+3 Mx2
W≥N+3 Nx2

T

D-J(Z)tan15°x2≥2
(Tip diameter Ø2 or More)
- L requires L-J(Z)≥20.
- When both ends are in T shape, L-(J+Z)≥20 is required.

When only one end requires alteration, select Shape A for the opposite end.
G and H will not be symmetrical when applied to both ends of the shaft.
When D=P or D=N is selected for shaft shape C, B(S) needs to be specified as F=B(T=S). However, L, F, and T dimensions have manufacturing priority and B(S) dimension will be F(T)-(Pitch x2).

Part Number			Selection	0.5mm Increment	1mm Increment						Selection	C
Type	Left End Shape	Right End Shape	D	L	F, T	B, S	H, U	P, Q	R, W	J, Z	M, N (Coarse)	
(D Tol. g6) FSFJ FSSFJ FPSFJ FPSSFJ (D Tol. h5) FSFU FSSFU	A B C D E F G H T	A B C D E F G H T	6 17 31 7 18 32 8 19 35 9 20 38 10 22 40 12 24 45 13 25 50 14 26 15 28 16 30	20.0~1500.0 (L≤Dx50)	2≤F≤Px5 2≤F≤Mx5 2≤T≤Qx5 2≤T≤Nx5	2≤B≤Mx3 2≤S≤Nx3 B≤F-2 S≤T-2 (When M, N≤6) B≤F-3 S≤T-3 (When M, N≤8, 10) B≤F-5 S≤T-5 (When M, N≥12)	2≤H, U (When D=6) 3≤H, U (When 6<D≤10) 4≤H, U (When 10<D≤20) 5≤H, U (When 20<D) H, U<$\frac{L}{2}$	D/3≤P, Q<D	D≥M+4+R D≥N+4+W R≥M+3 W≥N+3	D: J, Z 6, 7: 5~7 8, 9: 5~10 10: 5~14 12: 5~18 13, 14: 5~20 15: 10~24 16, 17: 10~25 18, 19: 10~28 20: 10~32	3 4 5 6 8 10 12 16 20 24 30	0.2 or less when D-Q (P, M, N)≤4, 0.5 or less when D<20, 1.0 or less when D≥20

Ordering Example

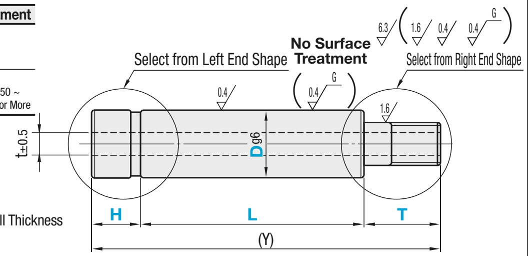
Part Number (Type, Left End, Right End)	- D	- L	- F	- M	- B	- T	- N	- S	- H	- U	- P	- Q	- R	- W	- J	- Z
FSFJ A C	- D12	- L100				- T30	- N6	- S12								

Alterations
For details, please see Alteration Overview on P.113.
Applicable to LKC, SC, WSC, PMC, PMS, QMC and QMS only.

Type	D	Material Unit Price Left End: Shape A Right End: Shape A												Shaft End Alteration Unit Price							
		Min. L ~ 50	50.5~100	100.5~150	150.5~200	200.5~300	300.5~400	400.5~500	500.5~600	600.5~800	800.5~1000	1000.5~1200	1200.5~1500	B	C	D	E	F	G	H	T
FSFJ FSFU	6						-	-	-	-	-	-	-							-	
	7							-	-	-	-	-	-							-	
	8							-	-	-	-	-	-							-	
	9								-	-	-	-	-							-	
	10								-	-	-	-	-							-	
	12									-	-	-	-							-	
	13										-	-	-							-	
	14, 15										-	-	-							-	
	16										-	-	-								
	17, 18, 19											-	-								
	20											-	-								
	22, 24												-						-		-
	25																		-		-
	26, 28																		-		-
	30																		-		-
	31, 32																		-		-
	35																		-		-
	38																		-		-
	40																		-		-
	45																		-		-
	50	-																	-		-
FSSFJ FSSFU	6						-	-	-	-	-	-	-							-	
	7							-	-	-	-	-	-							-	
	8							-	-	-	-	-	-							-	
	9								-	-	-	-	-							-	
	10								-	-	-	-	-							-	
	12									-	-	-	-							-	
	13										-	-	-							-	
	14, 15										-	-	-							-	
	16										-	-	-								
	17, 18, 19											-	-								
	20											-	-								
	22, 24												-						-		-
	25																		-		-
	26, 28																		-		-
	30																		-		-
	31, 32																		-		-
	35																		-		-
	38																		-		-
	40																		-		-
	45																		-		-
	50	-																	-		-
FPSFJ	6						-	-	-	-	-	-	-							-	
	7							-	-	-	-	-	-							-	
	8							-	-	-	-	-	-							-	
	9								-	-	-	-	-							-	
	10								-	-	-	-	-							-	
	12									-	-	-	-							-	
	13										-	-	-							-	
	14, 15										-	-	-							-	
	16										-	-	-								
	17, 18, 19											-	-								
	20											-	-								
	22, 24												-						-		-
	25																		-		-
	26, 28																		-		-
	30																		-		-
	31, 32																		-		-
	35																		-		-
	38																		-		-
	40																		-		-
	45																		-		-
	50	-																	-		-
FPSSFJ	6						-	-	-	-	-	-	-							-	
	7							-	-	-	-	-	-							-	
	8							-	-	-	-	-	-							-	
	9								-	-	-	-	-							-	
	10								-	-	-	-	-							-	
	12									-	-	-	-							-	
	13										-	-	-							-	
	14, 15										-	-	-							-	
	16										-	-	-								
	17, 18, 19											-	-								
	20											-	-								
	22, 24												-						-		-
	25																		-		-
	26, 28																		-		-
	30																		-		-
	31, 32																		-		-
	35																		-		-
	38																		-		-
	40																		-		-
	45																		-		-
	50	-																	-		-

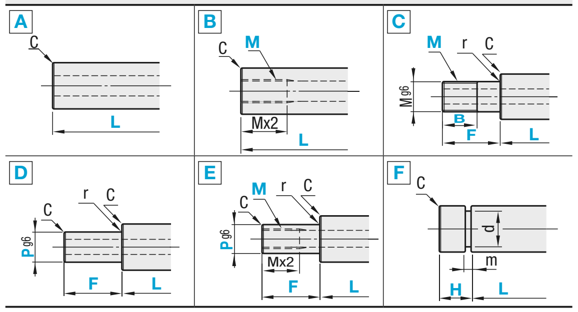
Hollow Shafts / End-Washers for Linear Shafts
Shaft Ends Configurable

Type	M Material	H Hardness	S Surface Treatment
FSPJ	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 58HRC~	-
FPSPJ			Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More

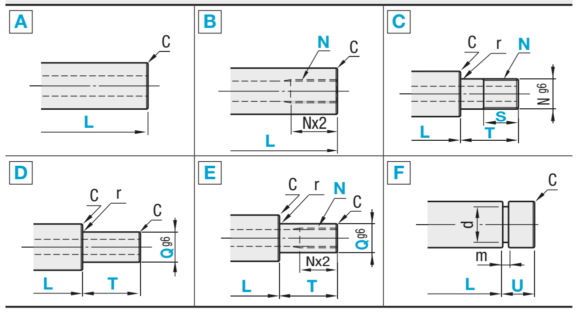


About Hollow Shaft Wall Thickness Deviations See P.111
(Y) dimensions need to be (Y)≤Dx50. (Y)≤1500
L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Wall Thickness Deviations and Changes in Hardness P.111, P.216

Left End Shape



Right End Shape



Machining Conditions A No alteration condition for Shape.

B
- When D=6, M=3
- When 8≤D≤12 t+1≤M(N)≤D-3
- When 13≤D≤25 t+2≤M(N)≤D-3
- When 30≤D≤40 t+2≤M(N)≤D-7
- Not applicable to D=50.
- One End Tapped Hollow Shafts See P.215
- L≥M(N)x4

C

D	r
6~30	0.3 or Less
35~50	0.5 or Less

- When 6≤D≤20 t+4≤M(N)≤D
- When 25≤D≤40 t+6≤M(N)≤D
- Not applicable to D=50.
- Both Ends Threaded Hollow See P.217

B, S≤Pitchx3 is required.

D

D	r
6~30	0.3 or Less
35~50	0.5 or Less

One End Stepped Hollow See P.221

E

D	r
6~30	0.3 or Less
35~50	0.5 or Less

P(Q)≥M(N)+4

F

Retaining Ring Detailed Dimensions See P.820

When only one end requires alteration, select Shape A for the opposite end.

Part Number Type	Left End Shape	Right End Shape	Selection D	t	0.5mm Increment L	0.5mm Increment F, T	1mm Increment B, S	1mm Increment H, U	1mm Increment P, Q	Selection M, N (Coarse)	C
FSPJ FPSPJ	A B C D E F	A B C D E F	6	2	20.0~1500.0 (L≤Dx50)	2≤F≤P(M)x5 2≤T≤Q(N)x5	2≤B≤Mx3 2≤S≤Nx3 B≤F-2 S≤T-2 (When M, N≤6) B≤F-3 S≤T-3 (When M, N≤8, 10) B≤F-5 S≤T-5 (When M, N≥12)	2≤H, U (When D=6) 3≤H, U (When 6<D≤10) 4≤H, U (When 10<D≤20) 5≤H, U (When 20<D) H, U<$\frac{L}{2}$	t+4≤P, Q<D	3 4 5 6 8 10 12 16 20 24 30	0.5 or less when D<20, 1.0 or less when D≥20
			8	3							
			10	4							
			12	6							
			13	7							
			16	10							
			20	14							
			25	16							
			30	17							
			35	19							
			40	20							
			50	26							

Specify t<M, or t<N.

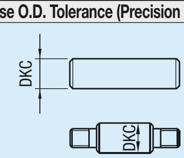
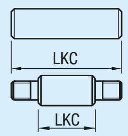
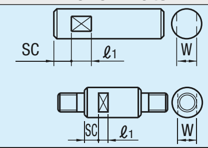
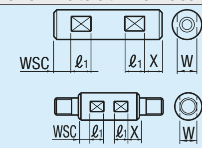
Ordering Example

Part Number Type	Left End	Right End	- D	- L	- F	- M	- B	- T	- N	- S	- H	- U	- P	- Q
FSPJ	A	C	D12	L100				T20	N10	S12				

Type	D	Min. L ~ 50	50.5~100	100.5~150	150.5~200	200.5~300	300.5~400	400.5~500	500.5~600	600.5~800	800.5~1000	1000.5~1200	1200.5~1500	B	C	D	E	F
		Material Unit Price Left End: Shape A Right End: Shape A												Shaft End Alteration Unit Price				
FSPJ	6~10								-	-	-	-	-					
	12, 13										-	-	-					
	16, 20											-	-					
	25																	
	30																	
	35																	
	40																	
	50	-																
FPSPJ	6~10								-	-	-	-	-					
	12, 13										-	-	-					
	16, 20											-	-					
	25																	
	30																	
	35																	
	40																	
	50	-																

Alterations

Part Number Type	Left End	Right End	- D	- L	- F	- M	- B	- T	- N	- S	- H	- U	- P	- Q	- (DKC···etc.)
FSPJ	A	C	D12	L100				T20	N6	S12					DKC

Alterations	Revise O.D. Tolerance (Precision Grade)	Alteration to L dimension tolerance	Wrench Flats	Wrench Flats at Two Locations
				
Code	DKC	LKC	SC	WSC
Spec.	O.D. tolerance is altered to h5. Ordering Code DKC (see table below) Not applicable to FPSPJ.	Changes L tolerance. Ordering Code LKC. L<200···L±0.03; 200≤L<500···L±0.05; L≥500···L±0.1. For use of LKC L dimensions can be specified in 0.1mm increment. Not applicable when D-M(N)≤2 for Shape C. Not applicable when D-P(Q)≤2 for Shape E.	Adds wrench flats. Ordering Code SC5. SC=1mm Increment. SC+ℓ1≤L. SC=0 or SC≥1. When selecting Shape B When D≤25, SC≥Mx2, SC+ℓ1≤L-Nx2 (see table below)	Adds Wrench Flats at two locations. Ordering Code WSC12-X8. WSC, X=1mm Increment. WSC+X+ℓ1x2≤L. WSC=0 or WSC≥1. X=0 or X≥1. When selecting Shape B WSC+X+ℓ1x2≤L, WSC≥Mx2, X≥Nx2. Orientation between two wrench flats is not coplanar. (see table below)

DKC:

D	h5 Tolerance
6	0 / -0.005
8, 10	0 / -0.006
12~16	0 / -0.008
20~30	0 / -0.009
35~50	0 / -0.011

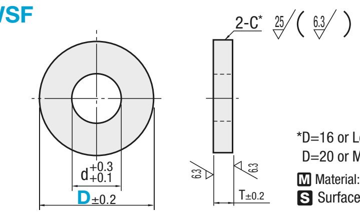
SC / WSC:

D	W	ℓ1	D	W	ℓ1
6	5	8	20	17	10
8	7		25	22	
10	8		30	27	15
12	10	10	35	30	
13	11		40	36	20
16	14		50	41	

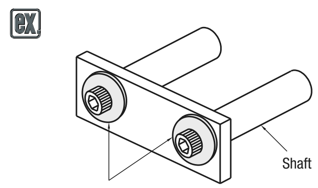
Alterations may lower hardness. See P.112

End-Washers for Linear Shafts

WSF



*D=16 or Less: C0.2 or Less
D=20 or More: C0.5 or Less
M Material: EN 1.1191 Equiv.
S Surface Treatment: Black Oxide



End-Washer for Linear Shafts

Part Number Type	Part Number D	d	T	Unit Price
WSF	10	3	3	
	12	4		
	13	5		
	16	6		
	20	8	5	
	25	10		
	30	12		
	35			
	40	16		
	50			

For Washers other than above, see P.2-113.

Ordering Example Part Number WSF10