

# Rotary Shafts - D Tolerance h9 (Cold-drawn) / h7 (Ground) / g6 (Ground)

## One End Stepped and Tapped

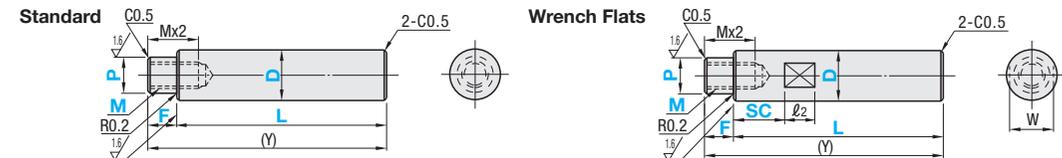
For products uncovered by the e-Catalog Standard, see P.131.

Select from h9 (Cold-drawn), h7 (Ground) and g6 (Ground) for your applications. Furthermore, h7 or g6 can be selected for P part tolerance of h9 (Cold-drawn).

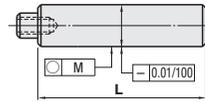
Type	Tolerance		Material	Surface Treatment
	Standard	Wrench Flats		
(1) SFRMHG PSFRMHG SSFRMHG	SFRMHGS PSFRMHGS SSFRMHGS	h9 (Cold-drawn)	S45C	Black Oxide
			Equivalent	Electroless Nickel Plating
			SUS304	-
(2) SFRMGG PSFRMGG SSFRMGG	SFRMGGS PSFRMGGS SSFRMGGS	h9 (Cold-drawn)	S45C	Black Oxide
			Equivalent	Electroless Nickel Plating
			SUS304	-
(3) SFRFHG PSFRFHG SSFRFHG	SFRFHGS PSFRFHGS SSFRFHGS	h7 (Ground)	S45C	Black Oxide
			Equivalent	Electroless Nickel Plating
			SUS304	-
(4) SFRFG PSFRFG SSFRFG	SFRFGS PSFRFGS SSFRFGS	g6 (Ground)	S45C	Black Oxide
			Equivalent	Electroless Nickel Plating
			SUS304	-

Tolerance Table			
D, P	h9 (Cold-drawn)	h7 (Ground)	g6 (Ground)
3.1-6	0 -0.030	0 -0.012	-0.004 -0.012
6.1-10	0 -0.036	0 -0.015	-0.005 -0.014
10.1-18	0 -0.043	0 -0.018	-0.006 -0.017
18.1-30	0 -0.052	0 -0.021	-0.007 -0.020
30.1-50	0 -0.062	0 -0.025	-0.009 -0.025

Surface roughness of Part D for h9 (Cold-drawn) is  $Ra \leq 1.6$ .  
Surface roughness for h7 (Ground) and g6 (Ground) is  $Ra \leq 0.8$ .



### Circularity and Straightness



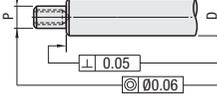
### Circularity of Part D

D	over	or Less	Circularity M
5	13		0.004
13	20		0.005
20	40		0.006
40	50		0.007

### Tolerances of L, Y and Other Dimensions

Dimension	over	or Less	Tolerance
2	6	30	$\pm 0.1$
6	30	120	$\pm 0.2$
30	120	400	$\pm 0.3$
120	400	1000	$\pm 0.5$
400	1000		$\pm 0.8$

### Concentricity and Perpendicularity



### (1)D tolerance h9 (Cold-drawn) / P tolerance h7 (2)D tolerance h9 (Cold-drawn) / P tolerance g6

Part Number	0.1mm Increment		1mm Increment		M (Coarse) Selection	1mm Increment SC	W	l <sub>2</sub>	(Y) max.
	Standard	Wrench Flats	D	L					
SFRMHG PSFRMHG SSFRMHG SFRMGG PSFRMGG SSFRMGG	SFRMHGS PSFRMHGS SSFRMHGS SFRMGGS PSFRMGGS SSFRMGGS	h9 / P Tol. h7	6	15.0-398.0	2sF≤Px5	5	SC+ $l_2 \leq L$ SC=0 or SC≥1 For SC≤Mx3-F, W-M≥2	5	400
			8	15.0-498.0		7		500	
			10	15.0-598.0		8		600	
			12	15.0-698.0		10		700	
			15	15.0-798.0		13		800	
			20	30.0-998.0		17		1000	
			25	30.0-998.0		22			
			30	30.0-998.0		27			
			40	40.0-998.0		36			
			50	40.0-998.0		41			

### (3)h7 (Ground)

Part Number	0.1mm Increment		1mm Increment		M (Coarse) Selection	1mm Increment SC	W	l <sub>2</sub>	(Y) max.
	Standard	Wrench Flats	D	L					
SFRFHG PSFRFHG SSFRFHG	SFRFHGS PSFRFHGS SSFRFHGS	h7 (Ground)	6	15.0-398.0	2sF≤Px5	5	SC+ $l_2 \leq L$ SC=0 or SC≥1 For SC≤Mx3-F, W-M≥2	5	400
			8	15.0-498.0		7		500	
			10	15.0-598.0		8		600	
			12	15.0-698.0		10		700	
			15	15.0-798.0		13		800	
			20	30.0-998.0		17		1000	
			25	30.0-998.0		22			
			30	30.0-998.0		27			
			40	40.0-998.0		36			
			50	40.0-998.0		41			

L-SC≤Nx3

### (4)g6 (Ground)

Part Number	0.1mm Increment		1mm Increment		M (Coarse) Selection	1mm Increment SC	W	l <sub>2</sub>	(Y) max.
	Standard	Wrench Flats	D	L					
SFRFG PSFRFG SSFRFG	SFRFGS PSFRFGS SSFRFGS	g6 (Ground)	6	15.0-398.0	2sF≤Px5	5	SC+ $l_2 \leq L$ SC=0 or SC≥1 For SC≤Mx3-F, W-M≥2	5	400
			8	15.0-498.0		7		500	
			10	15.0-598.0		8		600	
			12	15.0-698.0		10		700	
			15	15.0-798.0		13		800	
			20	30.0-998.0		17		1000	
			25	30.0-998.0		22			
			30	30.0-998.0		27			
			40	40.0-998.0		36			
			50	40.0-998.0		41			

When D-P≤2, chamfer C at the step is 0.2 or less.

L-SC≤Nx3

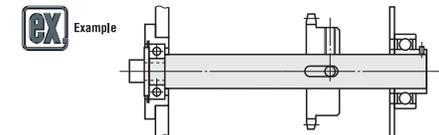
Ordering Example	Part Number	L	F	P	M	SC
(1)D part h9 / P part h7	SFRMHG30	250	F30	P16	M10	SC30
(3)h7 (Ground) with Wrench Flat	SFRFHG25	200	F40	P20	M10	SC30
(4)g6 (Ground)	SFRFG25	200	F40	P20	M10	SC30

### (1)D tolerance h9 (Cold-drawn) / P tolerance h7 (2)D tolerance h9 (Cold-drawn) / P tolerance g6

Type	SFRMHG, SFRMGG (S45C Equivalent, Black Oxide)								PSFRMHG, PSFRMGG (S45C Equivalent, Electroless Nickel Plating)								SSFRMHG, SSFRMGG (SUS304)										
	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1
D	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	998.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	998.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	998.0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### (3)h7 (Ground) (4)g6 (Ground)

Type	SFRFHG, SFRFG (S45C Equivalent, Black Oxide)								PSFRFHG, PSFRFG (S45C Equivalent, Electroless Nickel Plating)								SSFRFHG, SSFRFG (SUS304)										
	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1
D	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	998.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	998.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	998.0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Alterations Part Number - L - F - P - M - SC - (KC, WKC, FC-etc.)  
PSFRFHGS - 150 - F20 - P7 - M5 - SC20 - LKC

Alterations	Keyway		Keyway on Step P (Position Zero from End Face)		Keyway on Step P (Position Specified)		Multiple Keyways on Step P	
	1	2	1 (for 4th keyway)	PKC	PP, PK	PV, PW		
Code	KC	WKC	KZ	PKC	PP	PV		
Dimension Increment	KC, A = 0.1mm Increment	WKC, C, E, K = 0.1mm Increment	KZ, Z = 0.1mm Increment	PKC = 0.1mm Increment	PP, PK = 0.1mm Increment	PV, PW = 0.1mm Increment		
Ordering Example	KC50-A10	WKC5-C20-K5-E10	KC5-A10-WKC20-C10-K60-E10-K2100-Z10	PKC10	PP5-PK10	PP5-PK10-PV5-PW10		
Conditions	Key Length ≤ 100. *1, *2			Not applicable when P≤5. Key Length ≤ 70. *1, *2				