


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

## Both Ends Stepped

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

Select from h9 (Cold-drawn), h7 (Ground) and g6 (Ground) for your applications.



**RoHS10**

Surface roughness of Part D for h9 (Cold-drawn) is  $R_a 1.6$ . Surface roughness for h7 (Ground) and g6 (Ground) is  $R_a 0.4$ .

For Retaining Ring Groove Type, see P879.

Type	Tolerance		Material	Surface Treatment
	D	P, Q		
(1) SFRMHQ PSFRMHQ SSFRMHQ	h9 (Cold-drawn)	h7	S45C Equivalent	Black Oxide
SUS304			Electroless Nickel Plating	
S45C Equivalent			Black Oxide	
(2) SFRMGQ PSFRMGQ SSFRMGQ	g6 (Ground)	g6	S45C Equivalent	Black Oxide
SUS304			Electroless Nickel Plating	
S45C Equivalent			Black Oxide	
(3) SFRHQ PSFRHQ SSFRHQ	h7 (Ground)	h7	S45C Equivalent	Black Oxide
SUS304			Electroless Nickel Plating	
S45C Equivalent			Black Oxide	
(4) SFRQ PSFRQ SSFRQ HFRQ PHFRQ	g6 (Ground)	g6	S45C Equivalent	Black Oxide
SUS304			Electroless Nickel Plating	
SUS304			Electroless Nickel Plating	
SCM435			Black Oxide	
Hardness 30-35HRC			Electroless Nickel Plating	

Tolerance Table			
D, P	h9 (Cold-drawn)	h7 (Ground)	g6 (Ground)
3	0 -0.025	0 -0.010	-0.002 -0.008
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

**Circularity of Part D**

D over or Less	Circularity M
5	13
13	20
20	40
40	50

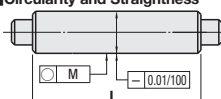
Not applicable to h9 (Cold-drawn).

**Tolerances of L, Y and Other Dimensions**

Dimension over or Less	Tolerance
2	6
6	30
30	120
120	400
400	1000

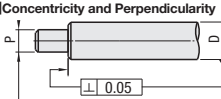
Not applicable to h9 (Cold-drawn).

**Circularity and Straightness**



Not applicable to h9 (Cold-drawn).

**Concentricity and Perpendicularity**



Not applicable to h9 (Cold-drawn).

Part Number	0.1mm Increment		F, T	1mm Increment P, Q	(Y)max.
	D	L			
(1)D Tol. h9 / P, Q Tol. h7	6	15.0-396.0	2≤F≤P×5	3 4 5	400
SFRMHQ	8	15.0-496.0		500	
PSFRMHQ	10	15.0-596.0		600	
SSFRMHQ	12	15.0-696.0		700	
(D6 is not available for SSFRMHQ)	15	15.0-796.0		800	
(2)D Tol. h9 / P, Q Tol. g6	20	30.0-996.0	2≤T≤Q×5	5 ≤ P, Q < D	800
SFRMGQ	25	30.0-996.0		1000	
PSFRMGQ	30	30.0-996.0			
SSFRMGQ	35	30.0-996.0			
(D6 is not available for SSFRMGQ)	40	40.0-996.0			
	50	40.0-996.0		16 ≤ P, Q < D	

Part Number	0.1mm Increment		F, T	1mm Increment P, Q	(Y)max.
	D	L			
(3)h7 (Ground)	6	15.0-396.0	2≤F≤P×5	3 4 5	400
SFRHQ	8	15.0-496.0		500	
PSFRHQ	10	15.0-596.0		600	
SSFRHQ	12	15.0-696.0		700	
	15	15.0-796.0		800	
	17	30.0-896.0	2≤T≤Q×5	5 ≤ P, Q < D	900
	20	30.0-996.0		1000	
	25	30.0-996.0			
	30	30.0-996.0			
	35	40.0-996.0			
	40	40.0-996.0		16 ≤ P, Q < D	
	50	40.0-996.0			

Part Number	0.1mm Increment		F, T	1mm Increment P, Q	(Y)max.
	D	L			
(4)g6 (Ground)	6	15.0-396.0	2≤F≤P×5	3 4 5	400
SFRQ	8	15.0-496.0		500	
PSFRQ	10	15.0-596.0		600	
SSFRQ	12	15.0-696.0		700	
(D13, D16, D18 or D22 is not available for SSFRQ.)	13	15.0-696.0		800	
	15	15.0-796.0	2≤T≤Q×5	5 ≤ P, Q < D	900
	16	15.0-896.0		1000	
	17	30.0-896.0			
	18	30.0-896.0			
	18	30.0-896.0			
	20	30.0-996.0		10 ≤ P, Q < D	
	22	30.0-996.0			
	25	30.0-996.0			
	30	30.0-996.0			
	35	40.0-996.0			
	40	40.0-996.0			
	50	40.0-996.0			

When D - P (Q) ≤ 2, chamfer C at the step is 0.2 or less. P, Q dim. cannot be configured to 27, 31, 33, 34, 36, 37, 38, 39, 41, 42, 43, 44, 46, 47, 48 or 49. For HFRQ, PHFRQ, the upper limit for L dim. is 796.

Ordering Example

(1)D Tol. h9 / P, Q Tol. h7 SFRMHQ20 - 325 - F25 - P10 - T25 - Q10

(3)h7 (Ground) SFRHQ15 - 150 - F15 - P8 - T15 - Q8

(4)g6 (Ground) SFRQ30 - 400 - F28 - P20 - T28 - Q20

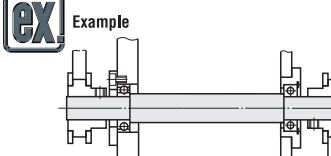
### (1)D Tolerance h9 (Cold-drawn) / P, Q Tolerance h7 (2)D Tolerance h9 (Cold-drawn) / P, Q Tolerance g6

Type	SFRMHQ, SFRMGQ (S45C Equivalent, Black Oxide)								PSFRMHQ, PSFRMGQ (S45C Equivalent, Electroless Nickel Plating)								SSFRMHQ, SSFRMGQ (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
D	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	996.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	996.0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Type	SFRHQ, SFRQ (S45C Equivalent, Black Oxide)								PSFRHQ, PSFRQ (S45C Equivalent, Electroless Nickel Plating)								SSFRHQ, SSFRQ (SUS304)									
	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	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	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	996.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	996.0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Example



Alterations

Part Number - L - F - P - T - Q - (KC, WKC, FC...etc.)

SFRMHQ30 - 300 - F25 - P10 - T25 - Q10 - KC40-A20

Alterations	Keyway					Retaining Ring Groove		
	1	2	1 (for 4th keyway)	Keyway on Step P (Position Zero from End Face)	Keyway on Step (Position Specified)	Multiple Keyways on Step	D dim.	Step
Code	KC	WKC	KZ	PKC, QKC	PP, QQ	PV, QV	TL, TR	TF, TT
Dimension Increment	KC, A = 0.1mm Increment	WKC, C, E, K = 0.1mm Increment	KZ, Z = 0.1mm Increment	PKC, QKC = 0.1mm Increment	PP, PK = 0.1mm Increment QQ, QK = 0.1mm Increment	PV, PW = 0.1mm Increment QV, QW = 0.1mm Increment	TL, TR = 0.1mm Increment	TF, TT = 0.1mm Increment
Ordering Example	KC50-A10	WKC5-C20-K5-E10	KZ5-A10-WKC20-C10-K60-E10-KZ100-Z10	PKC10	PP5-PK10	PP5-PK10-PV5-PW10	TL10	TF10
Conditions	Key Length ≤ 100. *1, *2					Not applicable when P≤5. Key Length ≤ 70. *1, *2. * Only when PP (Q) is specified, PV (Q) is available. F+TL≤150 T+TR≤150		2≤TF, TT≤150

Alterations	Set Screw Flat					Chamfering Depth Configurable
	1	2	2 Set Screw Flats (Angle Specified)	Set Screw Flat on Step	2 Set Screw Flats at both ends	
Code	FC	WFC	SFC	PFC, QFC	KWC	WC
Dimension Increment	FC, G = 1mm Increment	WFC, J, V, W = 1mm Increment	SFC, SG = 1mm Increment AG = 15° Increment	PFC, LC = 1		