


# 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**

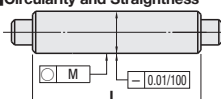
D over or Less	Circularity M
5	0.004
13	0.005
20	0.006
40	0.007

Not applicable to h9 (Cold-drawn).

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

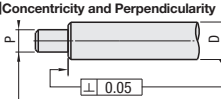
Dimension over or Less	Tolerance
2	±0.1
6	±0.2
30	±0.3
120	±0.5
400	±0.8

**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≤Px5 2≤T≤Qx5	3 4 5	400
SFRMHQ	8	15.0-496.0		500	
PSFRMHQ	10	15.0-596.0		3 ≤ P, Q < D	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		5 ≤ P, Q < D	800
SFRMGQ	25	30.0-996.0		10 ≤ P, Q < D	1000
PSFRMGQ	30	30.0-996.0		16 ≤ P, Q < D	
SSFRMGQ	35	40.0-996.0			
(D6 is not available for SSFRMGQ)	50	40.0-996.0			

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≤Px5 2≤T≤Qx5	3 4 5	400
SFRHQ	8	15.0-496.0		500	
PSFRHQ	10	15.0-596.0		3 ≤ P, Q < D	600
SSFRHQ	12	15.0-696.0		700	
	15	15.0-796.0		800	
	17	30.0-896.0		900	
	20	30.0-996.0		10 ≤ P, Q < D	1000
	25	30.0-996.0		16 ≤ P, Q < D	
	30	30.0-996.0			
	35	40.0-996.0			
	40	40.0-996.0			
	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≤Px5 2≤T≤Qx5	3 4 5	400
SFRQ	8	15.0-496.0		500	
PSFRQ	10	15.0-596.0		3 ≤ P, Q < D	600
SSFRQ	12	15.0-696.0		700	
	13	15.0-696.0		800	
	*15	15.0-796.0		900	
	*16	15.0-896.0		5 ≤ P, Q < D	1000
	*17	30.0-896.0		10 ≤ P, Q < D	
	*18	30.0-896.0		16 ≤ P, Q < D	
	*20	30.0-996.0			
	*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

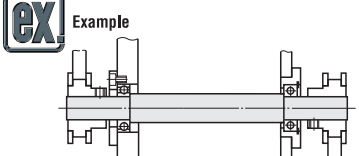
### (1)D Tolerance h9 (Cold-drawn) / P, Q Tolerance h7 (2)D Tolerance h9 (Cold-drawn) / P, Q Tolerance g6

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Example



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

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

Alterations

1	2	1 (for 4th keyway)	Keyway	Retaining Ring Groove
Code: KC	Code: WKC	Code: KZ	Code: PKC, QKC	Code: TL, TR
Dimension Increment: KC, A = 0.1mm Increment	Dimension Increment: WKC, C, E, K = 0.1mm Increment	Dimension Increment: KZ, Z = 0.1mm Increment	Dimension Increment: PKC, QKC = 0.1mm Increment	Dimension Increment: TL, TR = 0.1mm Increment
Ordering Example: KC50-A10	Ordering Example: WKC5-C20-K5-E10	Ordering Example: KCS-A10-WKC20-C10-K60-E10-K2100-Z10	Ordering Example: PKC10	Ordering Example: TL10
Conditions: Key Length ≤ 100. *1, *2	Conditions: Key Length ≤ 70. *1, *2	Conditions: Key Length ≤ 70. *1, *2	Conditions: Key Length ≤ 70. *1, *2	Conditions: Key Length ≤ 70. *1, *2

Alterations

1	2	2 Set Screw Flats (Angle Specified)	Set Screw Flat on Step	2 Set Screw Flats at both ends	Chamfering Depth Configurable
Code: FC	Code: WFC	Code: SFC	Code: PFC, QFC	Code: KWC	Code: WC
Dimension Increment: FC, G = 1mm Increment	Dimension Increment: WFC, J, V, W = 1mm Increment	Dimension Increment: SFC, SG = 1mm Increment	Dimension Increment: PFC, LC = 1mm Increment	Dimension Increment: KWC = 1mm Increment	Dimension Increment: WC = 0.1mm
Ordering Example: FC10-G3	Ordering Example: WFC10-J15-W10-V20	Ordering Example: SFC10-SG3-AG120	Ordering Example: PFC10-LC5	Ordering Example: KWC10	Ordering Example: WC6.8
Conditions: For H dim., see P843. G, J, V, SG, LC, RC ≤ 70	Conditions: For H dim., see P843. G, J, V, SG, LC, RC ≤ 70	Conditions: For H dim., see P843. G, J, V, SG, LC, RC ≤ 70	Conditions: For H dim., see P843. G, J, V, SG, LC, RC ≤ 70	Conditions: For H dim., see P843. G, J, V, SG, LC, RC ≤ 70	Conditions: For H dim., see P843. G, J, V, SG, LC, RC ≤ 70

Alterations

Slit Cam Groove	L Dimension Tolerance	Wrench Flats	Concentricity	C Chamfered Width Step Chamfering	Tapping
Code: UC	Code: LKC	Code: SC	Code: CKC	Code: CP, CQ	Code: PM, QM
Dimension Increment: UC = 1mm Increment	Dimension Increment: LKC = 0.05	Dimension Increment: SC = 1mm Increment	Dimension Increment: CKC = 0.05	Dimension Increment: CP, CQ = Selectable	