


Rotary Shafts – D Tolerance h9 (Cold-Drawn) / h7 & g6 (Ground)

Both Ends Stepped

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



RoHS 10

Type	Tolerance		Material	Surface Treatment
	D	P / Q		
(1) NSFRMHQ SFRMHQ PSFRMHQ SSFRMHQ	h9 (Cold-Drawn)	h7	1045 Carbon Steel or Equivalent	Black Oxide
				Electroless Nickel Plating
				—
(2) NSFRMGQ SFRMGQ PSFRMGQ SSFRMGQ	h9 (Cold-Drawn)	g6	1045 Carbon Steel or Equivalent	Black Oxide
				Electroless Nickel Plating
				—
(3) NSFRHQ SFRHQ PSFRHQ SSFRHQ	h7 (Ground)	h7	1045 Carbon Steel or Equivalent	Black Oxide
				Electroless Nickel Plating
				—
(4) NSFRQ SFRQ PSFRQ SSFRQ HFRQ PHFRQ	g6 (Ground)	g6	1045 Carbon Steel or Equivalent	Black Oxide
				Electroless Nickel Plating
				—
			304 Stainless Steel	Black Oxide
				Electroless Nickel Plating
				—
			4137 Alloy Steel or Equivalent Hardness 30–35 HRC min.	Black Oxide
				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

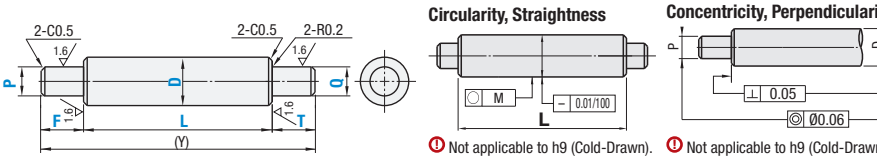
Circularity of Part D

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

Tolerances of L, Y & Other Dimensions

Over	Dimension or Less	Tolerance
2	6	±0.1
6	30	±0.2
30	120	±0.3
120	400	±0.5
400	800	±0.8

Circularity, Straightness and **Concentricity, Perpendicularity**



Surface roughness of D part for h9 (Cold-Drawn) is $R_{a} 3.2$
Surface roughness for h7 (Ground) and g6 (Ground) is $R_{a} 1.6$

Not applicable to h9 (Cold-Drawn).

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

Type	Part Number	D	0.1 mm Increment		1 mm Increment	(Y) max.
			L	F, T		
(1) D part h9 / P, Q part h7 NSFRMHQ SFRMHQ PSFRMHQ SSFRMHQ	D6 is not available for SSFRMHQ	6	15.0–396.0	$2 \leq F \leq P \times 5$ $2 \leq T \leq Q \times 5$	3 4 5	300
		8	15.0–496.0		3 ≤ P, Q < D	400
		10	15.0–596.0		500	
		12	15.0–696.0		600	
		15	15.0–796.0		700	
(2) D part h9 / P, Q part g6 NSFRMGQ SFRMGQ PSFRMGQ SSFRMGQ	D6 is not available for SSFRMGQ	20	30.0–996.0	5 ≤ P, Q < D	800	
		25	30.0–996.0	10 ≤ P, Q < D		
		30	30.0–996.0			
		35	40.0–996.0	16 ≤ P, Q < D		

(3) h7 (Ground)

Type	Part Number	D	0.1 mm Increment		1 mm Increment	(Y) max.
			L	F, T		
NSFRHQ SFRHQ PSFRHQ SSFRHQ		6	15.0–396.0	$2 \leq F \leq P \times 5$ $2 \leq T \leq Q \times 5$	3 4 5	300
		8	15.0–496.0		3 ≤ P, Q < D	400
		10	15.0–596.0		500	
		12	15.0–696.0		600	
		15	15.0–796.0		700	
		17	30.0–896.0		5 ≤ P, Q < D	
		20	30.0–996.0		10 ≤ P, Q < D	
		25	30.0–996.0			
		30	40.0–996.0		16 ≤ P, Q < D	
		40	40.0–996.0			

(4) g6 (Ground) Type

Type	Part Number	D	0.1 mm Increment		1 mm Increment	(Y) max.
			L	F, T		
NSFRQ SFRQ PSFRQ SSFRQ	D13, 16, 18 and 22 are not available for SSFRQ. Only * marked sizes are available.	6	15.0–396.0	$2 \leq F \leq P \times 5$ $2 \leq T \leq Q \times 5$	3 4 5	300
		8	15.0–496.0		3 ≤ P, Q < D	400
		10	15.0–596.0		500	
		12	15.0–696.0		600	
		13	15.0–696.0		600	
		*15	15.0–796.0		700	
		16	15.0–896.0		5 ≤ P, Q < D	
		17	30.0–896.0		10 ≤ P, Q < D	
		18	30.0–896.0			
		*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		16 ≤ P, Q < D	
		*40	40.0–996.0			
*50	40.0–996.0					

① When D-P(Q) ≤ 2, chamfer C at the step is 0.2 or less.
② For P and Q dimensions / 27 / 31 / 33 / 34 / 36 / 37 / 38 / 39 / 41 / 42 / 43 / 44 / 46 / 47 / 48 and 49 cannot be specified.

Rotary Shafts – D Tolerance h9 (Cold-Drawn) / h7 & g6 (Ground)

Both Ends Stepped, continued

Available Types

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

Type	NSFRMHQ, NSFRMGQ, SFRMHQ, SFRMGQ, PSFRMHQ, PSFRMGQ										SSFRMHQ, SSFRMGQ																
	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	996.0	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	996.0							
D	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	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	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
35	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
50	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Part Number Example

Part Number - L - F - P - T - Q

SFRMHQ20 - 325 - F25 - P10 - T25 - Q10

SFRHQ15 - 150 - F15 - P8 - T15 - Q8

SFRQ30 - 400 - F28 - P20 - T28 - Q20

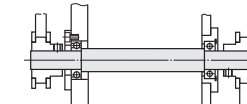
Part Number Alterations


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

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

Application Example

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



Alterations	Keyway	Set Screw Flat	2 Set Screw Flats (Angle Specified)	Slit Cam Groove	Wrench Flats	L Dimension Tolerance - Concentricity	Keyway on Shaft End	2 Set Screw Flats at Both Ends	Chamfering Depth Configurable
Code	KC, WKC, KZ	FC, WFC	SFC	UC	SC	LKC, CKC	PKC, QKC	KWC	WC
Spec.	KC: Adds a keyway. Ordering Code: KC50-A10 WKC: Adds two keyways. Ordering Code: WKC50-C8-K40-E10 Ordering Code: KZ100-Z10 ① KC, A, WKC, C, E, K, KZ, Z = 0.1 mm increment ② A, C, E, Z ≤ 100 ③ For keyway details refer to P.853 ④ If 3 keyways are required use both KC and WKC. ⑤ If 4th keyway is required use KZ only in addition to KC and WKC. ⑥ When keyway position is less than 1 mm away from the end face, R is not applied. Ex:  ⑦ Keyways and set screw flats are added in the same plane. When the distance of the alterations are over 500 mm, ±2 degree phase differential may occur.	FC: Adds 1 set screw flat. Ordering Code: FC10-G3 WFC: Adds 2 set screw flats. Ordering Code: WFC10-J3-W10-V3 ① FC, G, WFC, J, W, V = 1 mm increment ② G, J, V ≤ 50	SFC: Adds a set screw flat at any designated angle besides the datum plane (0°). SFC, SG = 1 mm increment AG = 15° increment ① SG ≤ 50 Ordering Code: SFC10-SG3-AG90	UC = 1 mm increment Ordering Code: UC10 ① UC ≤ 1 ② Not applicable to D13 or more.	SC = 1 mm increment SC = 1 mm increment SC = 0 or SC = 1 ① SC + ε ≤ L ② SC = 0 or SC = 1	LKC: Changes L dimension tolerance. Ordering Code: LKC ① L < 500 → L ± 0.05 L ≥ 500 → L ± 0.1 ② Not applicable to L = 800 or more. CKC: Changes the concentricity to 0.02. Ordering Code: CKC ① Applicable within dimension L range in the table below. ② Not applicable to D part of h9 (Cold-Drawn).	PKC, QKC = 1 mm increment ① PKC, QKC ≤ 50 PKC (QKC) = F (T) ② For keyway details refer to P.853. ③ Not applicable to P (Q) = 5 or less.	KWC = 680 is applicable ① KWC ≤ F, T ② Y ≤ 680 is applicable	WC ① P, Q ≤ 5 = WC ② D8 or more is applicable. ③ Applicable only when KWC alteration is performed.

① For Keyway Details, P.853.

Alterations	Keyway on Step P, Q	2nd Keyway on Step P, Q	Set Screw Flat on P, Q	Retaining Ring Groove on D	Retaining Ring Groove on P, Q	C Chamfer Change on P, Q	Add Tappings
Code	PP, PQ	PV, QV	PFC, QFC	TL, TR	TF, TT	CP, CQ	PM, QM
Spec.	PP, PK = 0.1 mm increment. PQ, QK = 0.1 mm increment. Ordering Code: PPS-PK11-PV5-PW10 ① Not applicable when P ≤ 5 ② Key Length (PK) ≤ 70	PV, PW = 0.1 mm increment. QV, QW = 0.1 mm increment. Ordering Code: PPS-PK11-PV5-PW10 ① Only available when PP(Q) specified. ② Not applicable when P ≤ 5. ③ Key Length (PK) ≤ 71	PFC, LC = 1 mm increment. QFC, RC = 1 mm increment. Ordering Code: PFC10-LC5	TL, TR = 0.1 mm increment. Ordering Code: TL10, TR10 ① 2 ≤ TR ≤ 150 and TL + F ≤ 150 ② For dimension m, see P.853.	TF, TT = 0.1 mm increment. Ordering Code: TF10 ① 2 ≤ TF ≤ 150, 2 ≤ TT ≤ 150 ② For dimension m, see P.853.	CP, CQ = Selection from Table below. Ordering Code: CP3 Chamfer (CP, CQ) Applicable Dia. C2 φ6–φ49 C3 φ8–φ49 C4 φ10–φ49 C5 φ12–φ49	Selections: M2, 2.6, 3, 4, 5, 6, 8, 10, 12, 24, 30. Ordering Code: PM4 ① (P-PM)/2 ± 0.5 ② (Q-PM)/2 ± 0.5