


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

Straight

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

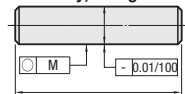


**Rotary Shafts – Straight**

RoHS10

Type	D Tolerance	Material	Surface Treatment
(1)	h9 (Cold-Drawn)	1045 Carbon Steel or Equivalent	—
			Black Oxide
			Electroless Nickel Plating
			—
(2)	h7 (Ground)	1045 Carbon Steel or Equivalent	—
			Black Oxide
			Electroless Nickel Plating
			—
(3)	g6 (Ground)	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		
	—		

**Circularity, Straightness**



⊙ Straightness of size D2, D2.5 is 0.1/100.  
⊙ Not applicable to h9 (Cold-Drawn).

**Circularity of Part D**

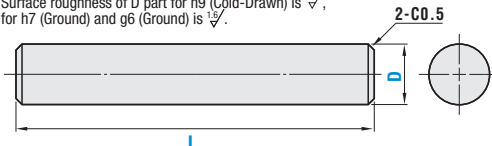
Over	D	or Less	Circularity M
1	2.5		0.006
3	13		0.004
13	20		0.005
20	40		0.006
40	50		0.007

⊙ Not applicable to h9 (Cold-Drawn).

**L Dimension Tolerance**

Over	Dimension	To	Dimension Tolerance
14	30		±0.2
30	120		±0.3
120	400		±0.5
400	800		±0.8

⊙ Surface roughness of D part for h9 (Cold-Drawn) is  $Ra \sqrt[3]{\dots}$ , for h7 (Ground) and g6 (Ground) is  $Ra \sqrt[3]{\dots}$ .



**(1) h9 (Cold-Drawn)**

Type	Part Number	D <sub>h9</sub>	L 0.1 mm Increment
NSFMR SFMR PSFMR SSFMR	3	0 -0.025	15.0–150.0
	4	0	15.0–200.0
	5	-0.030	15.0–250.0
	6	0	15.0–400.0
	8	0	15.0–500.0
	10	-0.036	15.0–600.0
	12	0	15.0–700.0
	15	-0.043	15.0–800.0
	20	0	30.0–1000.0
	25	0	50.0–1000.0
30	-0.052	60.0–1000.0	
35	0	70.0–1000.0	
40	-0.062	80.0–1000.0	
50	0	100.0–1000.0	

**(2) h7 (Ground)**

Type	Part Number	D <sub>h7</sub>	L 0.1 mm Increment
NSFHR SFHR PSFHR SSFHR	3	0 -0.010	15.0–150.0
	4	0	15.0–200.0
	5	-0.012	15.0–250.0
	6	0	15.0–400.0
	8	0	15.0–500.0
	10	-0.015	15.0–600.0
	12	0	15.0–700.0
	15	-0.018	15.0–800.0
	20	0	30.0–900.0
	25	0	50.0–1000.0
30	-0.021	60.0–1000.0	
35	0	70.0–1000.0	
40	-0.025	80.0–1000.0	
50	0	100.0–1000.0	

**(3) g6 (Ground)**

Type	Part Number	D <sub>g6</sub>	L 0.1 mm Increment
NSFR SFR PSFR SSFR	2	-0.002	15.0–50.0
	2.5	-0.008	15.0–50.0
	3	0	15.0–150.0
	4	0	15.0–200.0
	5	-0.004	15.0–250.0
	6	-0.012	15.0–400.0
	8	-0.005	15.0–500.0
	10	-0.014	15.0–600.0
	12	0	15.0–700.0
	*13	0	15.0–700.0
**15	-0.006	15.0–800.0	
*16	-0.017	15.0–900.0	
*17	0	30.0–900.0	
*18	0	30.0–900.0	
**20	0	30.0–1000.0	
*22	-0.007	40.0–1000.0	
**25	-0.020	50.0–1000.0	
**30	0	60.0–1000.0	
**35	0	70.0–1000.0	
**40	-0.009	80.0–1000.0	
**50	-0.025	100.0–1000.0	

\*D6 is not available for SSFMR.

\* Only \* marked sizes are available.

\* PHFR Only \* marked sizes are available.


**Part Number Example**

Part Number - L

SFMR15 - 150

PSFHR20 - 300

**Application Example**



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

Straight, *continued*

## Available Types

**(1) h9 (Cold-Drawn)**

Type	NSFMR, SFMR, PSFMR										SSFMR							
	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	L1000	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	1000	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000
3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
10	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
15	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
30	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
35	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
50	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

**(2) h7 (Ground) (3) g6 (Ground)**

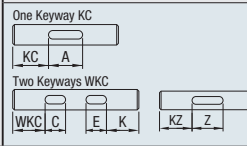
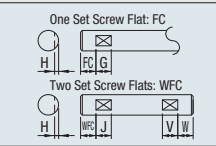
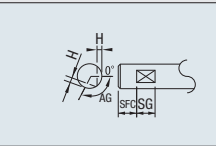
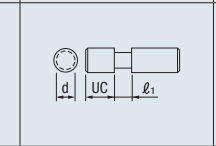
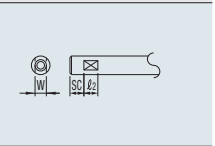
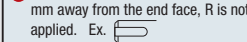
Type	NSFHR, SFHR, SFR, PSFHR, PSFR										SSFHR, SSFR								HFR, PHFR								
	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	L1000	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1
D	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	
2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
2.5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
10	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
15	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
17	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
18	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
22	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
30	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
35	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
50	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

**Part Number Alterations**

Part Number - L - (KC, WKC, FC...etc.)

PSFMR30 - 250 - KC20-A10

⊙ For Keyway Details, P.853.  
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																																																																																		
Alterations	 <p>One Keyway KC Two Keyways WKC</p>	 <p>One Set Screw Flat: FC Two Set Screw Flats: WFC</p>																																																																																					
Code	KC / WKC / KZ	FC / WFC	SFC	UC	SC																																																																																		
Spec.	<p>KC: Adds a keyway. Ordering Code: KC50-A10 WKC: Adds two keyways. Ordering Code: WKC50-C8-K40-E10 Ordering Code: KZ100-Z10</p> <p>⊙ KC, A, WKC, C, E, K, KZ, Z = 0.1 mm Increment ⊙ A, C, E, Z ≤ 100 ⊙ For keyway details, P.853. ⊙ If 3 keyways are required use both KC and WKC. If 4th keyway is required use KZ only as addition to KC and WKC. ⊙ Not applicable to D=2-5 ⊙ When keyway position is less than 1 mm away from the end face, R is not applied. Ex. </p> <p>⊙ 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.</p>	<p>FC: Adds 1 set screw flat. Ordering Code: FC10-G3 WFC: Adds 2 set screw flats. Ordering Code: WFC10-J3-W10-V3</p> <p>⊙ FC, G, WFC, J, W, V = 1 mm Inc. ⊙ G, J, V ≤ 50</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th>D</th><th>H</th></tr> </thead> <tbody> <tr><td>3-5</td><td>0.5</td></tr> <tr><td>6-17</td><td>1</td></tr> <tr><td>18-40</td><td>2</td></tr> <tr><td>50</td><td>3</td></tr> </tbody> </table> <p>⊙ Not applicable to D2 and D2.5.</p>	D	H	3-5	0.5	6-17	1	18-40	2	50	3	<p>Adds a set screw flat at any designated angle besides the datum plane (0°). SFC, SG = 1 mm Increment AG = 15° Increment ⊙ SG ≤ 50 Ordering Code: SFC10-SG3-AG120</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th>D</th><th>H</th></tr> </thead> <tbody> <tr><td>3-5</td><td>0.5</td></tr> <tr><td>6-17</td><td>1</td></tr> <tr><td>18-40</td><td>2</td></tr> <tr><td>50</td><td>3</td></tr> </tbody> </table> <p>⊙ Not applicable to D2 and D2.5. ⊙ When combined with other alterations, ±2 degree phase differential may occur.</p>	D	H	3-5	0.5	6-17	1	18-40	2	50	3	<p>Adds a slit cam groove. UC = 1 mm Increment Ordering Code: UC10</p> <p>⊙ UC + ℓ ≤ L ⊙ UC ≥ 1 ⊙ Not applicable to D2 and D2.5. ⊙ Not applicable to D13 or more.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th>D</th><th>d</th><th>ℓ<sub>2</sub></th></tr> </thead> <tbody> <tr><td>3</td><td>2</td><td></td></tr> <tr><td>4</td><td>3</td><td></td></tr> <tr><td>5</td><td>4</td><td>4</td></tr> <tr><td>6</td><td>5</td><td></td></tr> <tr><td>8</td><td>7</td><td></td></tr> <tr><td>10</td><td>8</td><td>5</td></tr> <tr><td>12</td><td>10</td><td></td></tr> </tbody> </table>	D	d	ℓ <sub>2</sub>	3	2		4	3		5	4	4	6	5		8	7		10	8	5	12	10		<p>Adds a wrench flat. SC = 1 mm Increment ⊙ SC + ℓ ≤ L ⊙ SC = 0 or SC ≥ 1 ⊙ A wrench flat is added to the opposite surface of keyway alteration.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr><th>D</th><th>W</th><th>ℓ<sub>2</sub></th><th>D</th><th>W</th><th>ℓ<sub>2</sub></th></tr> </thead> <tbody> <tr><td>6</td><td>5</td><td></td><td>25</td><td>22</td><td>10</td></tr> <tr><td>8</td><td>7</td><td>8</td><td>30</td><td>27</td><td></td></tr> <tr><td>10</td><td>8</td><td></td><td>35</td><td>30</td><td>15</td></tr> <tr><td>12-13</td><td>10</td><td></td><td>40</td><td>36</td><td>20</td></tr> <tr><td>15-16</td><td>13</td><td></td><td>50</td><td>41</td><td></td></tr> <tr><td>17-18</td><td>14</td></tr></tbody></table>	D	W	ℓ <sub>2</sub>	D	W	ℓ <sub>2</sub>	6	5		25	22	10	8	7	8	30	27		10	8		35	30	15	12-13	10		40	36	20	15-16	13		50	41		17-18	14
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