Drawn Cup Needle Cluthes
Drawn Cup Needle Cluthes with Bearing Assembly

Drawn cup needle clutches HF series

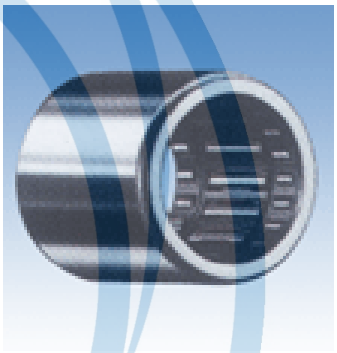
The drawn cup needle clutch HF series is composed of thin wall punched outer ring and plastic retainer.There is a clamping slope which holds the needles tightly on the inradius surface of the alloy steel punched out ring.the abrasion resistance and load capacity is greatly increased after special heat treatment.Metal springs are fitted on the plastic retainer which keeps the correct movement of the needles while the needles are used as clamping unit at the same time.

Through fitting drawn cup needle roller bearing HK, SCE series of the same diameter on the two sides of drawn cup needle clutch,better supporting rigidity and rotation characteristics are achieved.

Drawn cup needle clutches HF Series

Drawn cup needle clutches with bearing assembly HFL series

Drawn cup needle clutches with bearing assembly HFL series has a two-in-one supporting bearing which can be a special space-saving support. The supporting bearings fitted be the two sides of the needle clutch bear the radical load. The support bearings are needles and the plastic retainer.



Drawn cup needle clutches with bearing assembly HFL Series

Torque transmission capacity

When the recommended assembling tolerances are adopted, the maximum transmitting torque is mainly decided by the material,strength and wall thickness of the seat case and shaft.In a clutch,only enough wall thickness and appropriate material strength can sustain the force resulted.Inertial force should be taken into account.For the equivalent caused by the torque and the minimum wall thickness,please refer to Figure 1.The equivalent stress should be less than the stress permitted by the seat material. For the relation between free torque and axle diameter,please refer to Figure 2.

Example:

A known: drawn cup needle clutch HF3020

Load capacity: 90% of Md

Present wall thickness: Sexis=16mm

From Fig 1: minimum wall thickness Smin=4.8mm

Equivalent stress 6equiv=380N/mm2

B; known: drawn cup needle clutch HF1416

Permissive stress of seat casing 6perm=300N/mm2

Selective ratio of the seat casing wall thickness Smin/Sexis=0.5

From Fig 1: minimum wall thickness Smin=3.2mm

Permissive torque Md perm=60%Md

The switching frequency and precision

The needle clutch has a very small torque due to its thin radical section. Because each needle is supported by an independent spring, a constant contacting is maintained among the slopes of shaft,needles and punched outer ring, higher switching frequency and precision are allowed.Beside the switching frequency, the switching precision is depended on the selection of lubrication and combination. The elastic deformation of the neighboring parts and driving force are transmitted through the shaft or outer ring.The driving force is transmitted through shaft when the frequency is high.

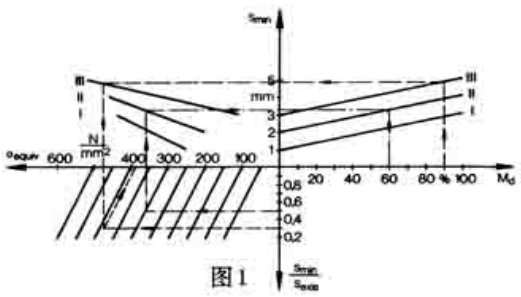


图1

Curve Ⅰ: HF0406/HFL0408 to HF1012/HFL1022

Curve Ⅱ: HF1216/HFL1226 to HF2016/HFL2026

Curve Ⅲ: HF2520/HFL2530 to HF3520/HFL3530

Feature inspection

The tools used by the manufacturer in inspection of drawn cup needle clutch are feeler gage and ring gage which are in seat hole and shaft tolerance range N6/h5 upper limit and lower limit.Meanwhile,the torque it sustains is approximately 0.15Md perm.The feeler gage used is quenched steel ring with its aperture precisely ground and the minimum wall thickness of 20mm.

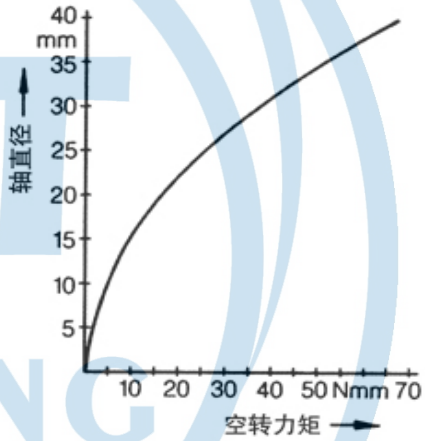


Figure 2 the relationship between free rotation torque and the axle diameter in the drawn cup needle clutch.

Operational temperature and lubrication

With good lubrication,drawn cup needle clutch can be operated for a long time under the temperature between -30°C-20°C.When the temperature is below -10°C or the speed is greater than 0.7 *nj,to ensure the normal functions of the bearings,recommended lubricants should be selected.In most cases,there are enough lubricants.So the products are filled in advance the quality lithium based grease in compliance with the national standards with the applicable temperature from -10 °C to 70 °C .Oil lubrication is recommended when the temperature exceeds 70°C.

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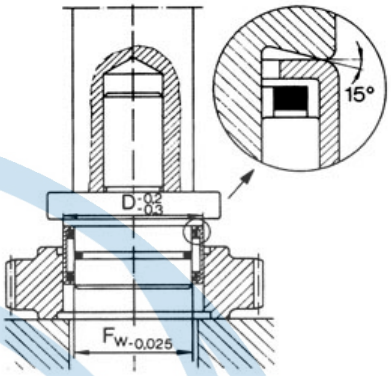
Mounting tolerance

As mounting,the shaft and the seat hole with a chamfered angle of 15 degrees will help to get the best fitting condition.The mounting method is shown in Figure 3.The needles and the thin wall punched outer ring of the clutch will get the concentric configuration only after being fitted into the seat.No other axle positioning is necessary.The mounting tolerance is the same as that of the drawn cup needle bearing.See table 1.The seat hole surface roughnes is Ra0.8.



Drawn cup needle clutch should be infused enough grease before mounting

Bearing seat material (rigid bearing seat)	Bearing seat hole tolerance	Shaft tolerance range Without inner ring	Inner ring
Steel and cast iron	N6(N7)	h5(h6)	k5(j6)
Light metal	R6(R7)		

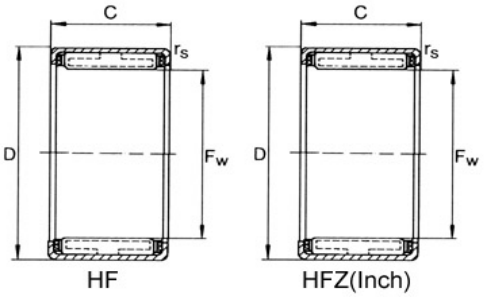
1)for non rigid bearing seats,fitting tests are needed to determine the required common tolerance limit so that the operational gap can be achieved.
2)The geometric precision of the cylinder shape of the bearing seat hole must fall into the half range of the value in IT5/2.

Special reminding:

1) Press the needle clutch into the seat hole with a fitting shaft.The clutch will be locked tightly when turning around in the arrow direction marked on the side of clutch.So,note the locking direction before fitting.
2) The close locking and overdrive clutching is possible only when the recommended tolerances are used.

Drawn Cup Needle Cluthes

Series HF, HFZ(Inch Size)



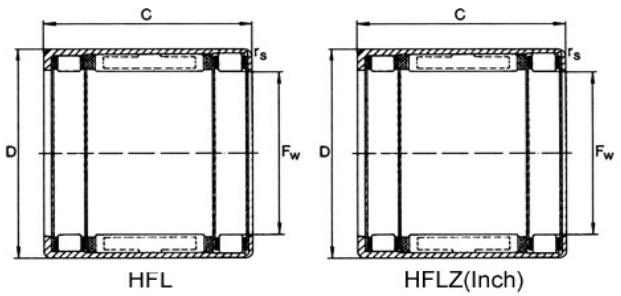
Shaft Diameter (mm)	Bearing Designation	Mass (g)	Boundary Dimensions (mm)			Transmiting Torque	Radial Supporting Bearing	Limiting Speed	
			Fw	D	C	Nm	HK	min-1	min-1
4	HF 0406	1.2	4	8	6	0.34	HK0408TN	32000	12000
6	HF 0612	3.2	6	10	12	1.76	HK0608	21000	11000
8	HF 0812	3.5	8	12	12	3.15	HK0808	15000	10000
10	HF 1012	4	10	14	12	5.3	HK1010	12000	9900
12	HF 1216	11.8	12	18	16	12.2	HK1212	9900	7200
14	HF 1416	13	14	20	16	17.3	HK1412	8600	7200
16	HF 1616	14	16	22	16	20.5	HK1612	7600	6500
18	HF 1816	15.8	18	24	16	24.1	HK1812	6500	6500
20	HF 2016	17	20	26	16	28.5	HK2010	6300	6000
25	HF 2520	31	25	32	20	66	HK2512	4800	4800
30	HF 3020	36	30	37	20	90	HK3012	4200	4200
35	HF 3520	40	35	42	20	121	HK3512	3500	3500
1/4	HFZ 040708	-	6.35	11.113	12.7	18.6	SCE44	21000	12000
3/8	HFZ 061008	-	9.525	15.875	12.7	50.4	SCE68	14000	12000
1/2	HFZ 081208	-	12.7	19.05	12.7	85.9	SCE87	11000	9000
5/8	HFZ 101410	-	15.875	22.225	15.88	175.2	SCE108	8500	5000
3/4	HFZ 121610	-	19.05	25.4	15.88	247.8	SCE126	7000	4400

Note:

1. When the plastic spring of different structure is used, the highest working temperature is +60℃.
2. The limited speed shown on the list is available for both grease and oil.
3. The product of working speed and radial load should not excess the limited value on the list, which determins the limit of application.

Drawn Cup Needle Cluthes with Bearing Assembly

Series HFL, HFLZ(Inch Size)



Shaft Diameter (mm)	Bearing Designation	Mass (g)	Boundary Dimensions			Transmiting Torque	Basic Load Rating		Limiting Speed	
							Dynamic	Static		
			Fw	D	C	Nm	Cr(N)	Cor(N)	min-1	min-1
8	HFL 0822	6.5	8	12	22	3.15	3900	4000	15000	10000
10	HFL 1022	7.5	10	14	22	5.3	4200	4400	12000	9900
12	HFL 1226	18	12	18	26	12.2	6200	6300	9900	7200
14	HFL 1426	20.5	14	20	26	17.3	7000	7500	9200	7200
16	HFL 1626	22	16	22	26	20.5	7100	8100	8000	6800
18	HFL 1826	24.5	18	24	26	24.1	8000	9300	6800	6800
20	HFL 2026	27	20	26	26	28.5	7800	9400	6300	6000
25	HFL 2530	44	25	32	30	66	9800	13500	5000	5000
30	HFL 3030	51	30	37	30	90	11000	15000	4000	4000
35	HFL 3530	58	35	42	30	121	12500	17000	3600	3600
3/8	HFLZ 061014	-	9.525	15.875	22.22	50.4	14000	12000	1315	1240
1/2	HFLZ 081214	-	12.7	19.05	22.22	85.9	11000	9000	1720	1550
5/8	HFLZ 101416	-	15.875	22.225	25.4	175.2	8500	5000	1720	1890

Note:

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