

HPP6-工程塑料轴承 Plastic Plain Bearings

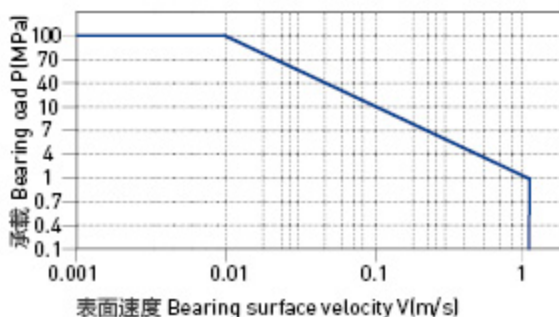
轴承PV值 PV Value

HPP6塑料轴承最大运行PV值为 $1.0\text{N/mm}^2 \times \text{m/s}$;由此决定轴承所承受的载荷与速度成反比, 详情查阅图表HPP6-1。

The max PV value of the HPP6 plastic bearing is $1.0\text{N/mm}^2 \times \text{m/s}$ which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph HPP6-1).

图表 HPP6-1: PV 图表

Graph HPP6-1: Permissible PV value for HPP6



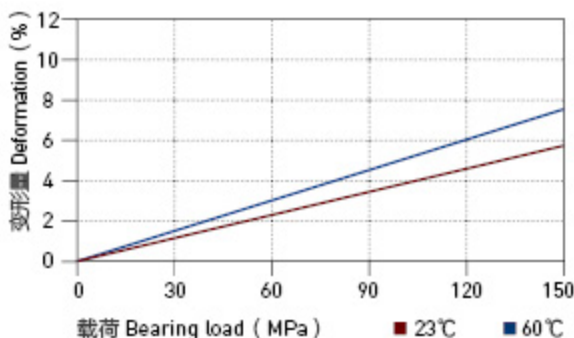
轴承的载荷、速度、温度 Load, Speed And Temperature

HPP6塑料轴承可承受最大静载荷为150Mpa, 在此载荷下轴承的最大压缩变形量参考图表HPP6-2; 轴承实际工作载荷小于150Mpa, 载荷还受到运行速度以及温度的影响, 速度越快 (Vmax: 1.5m/s)会导致摩擦温度上升, 而温度上升 (Tmax: 250℃)会导致轴承的承载能力逐渐减弱, 载荷随轴承工作温度变化情况参考图表HPP6-3。

HPP6 allows the max static load of 150Mpa, The max compressive deformation rate under the max load is listed in Graph HPP6-2; The actual load capacity of bearing is slightly less than 120Mpa, The bearing load is variable against the speed and temperature, Fast speed(Vmax: 1.5m/s) results into higher temperature (Tmax: 250℃) which decreases the load capacity of the bearing. Please refer to the Graph HPP6-3 for such variation.

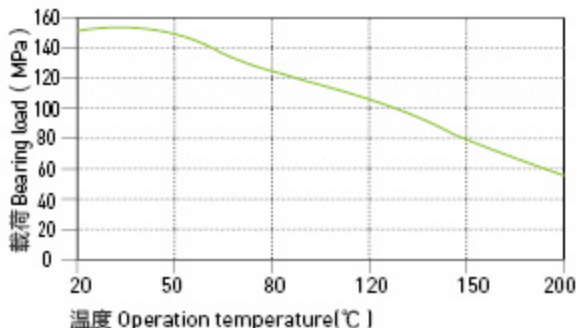
图表 HPP6-2: 载荷 - 温度 - 变形量图表

Graph HPP6-2: Load-Temperature deformation



图表 HPP6-3: 载荷 - 温度图表

Graph HPP6-3: Load-Temperature diagrams



HPP6-工程塑料轴承 Plastic Plain Bearings

轴承的摩擦系数、磨损、轴材料 Friction Factor, Wear And Shaft Material

■ 轴承的摩擦系数 Friction factor

图表HPP6-4表明HPP6轴承在载荷保持不变的情况下轴承的摩擦系数随着旋转速度的增加而先随之升高，当速度值达到0.2m/s后则又随着速度的增加而降低；图表HPP6-5表明HPP6轴承的摩擦系数在旋转速度保持不变的情况下随着载荷的不断上升而逐渐降低。 ，图表HPP6-6表明HPP6轴承对磨轴的粗糙度在Ra0.4 - 0.7 μ m时最适合的。

Graph HPP6-4 shows that the friction factor of HPP6 is initially increased along with the operation speed increasing when the loading is stable but when the speed reaches over 0.2m/s, it is decreased along with the operation speed increasing. Graph HPP6-5 shows that the friction factor of HPP6 is decreasing along with the loading increasing when the operation speed is stable. The best shaft roughness for this material is Ra0.4-0.7.

HPP6	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 μ Friction coef.	0.05-0.15	0.09	0.04	0.04

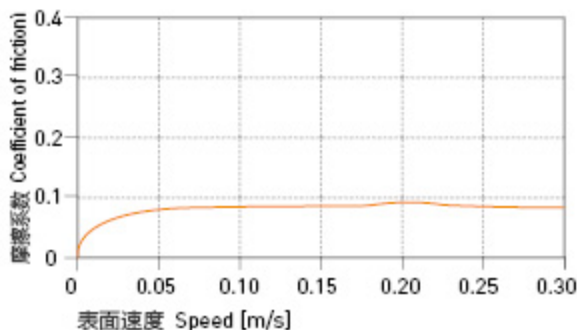
■ 磨损与轴材料 Wearing and shaft material

图表HPP6-7与图表HPP6-8表明HPP6轴承在低载下的磨损速率和其它轴承类似，而在中高载荷时此轴承的耐磨性要比其它轴承都要好；同时我们可以看出硬化轴比较适合用于HPP6轴承。图表HPP6-8表明HPP6轴承在摆动下的磨损要比旋转下的要小，当载荷超过2Mpa时这种现象尤为明显。在旋转运动下我们推荐使用硬化钢轴比较适合，而在摆动运动下我们建议采用不锈钢轴或硬铬钢轴比较理想。

Graph HPP6-7 and Graph HPP6-8 shows that the wearing speed of HPP6 is similar with most of the other materials under lower loading but it will be much better when the loading is higher. It also tells that the hardened steel shaft is good for HPP6 bearings. Graph HPP6-8 shows the wearing rate is less in oscillation operation than in rotation operation especially when the loading is over 20Mpa. Heat-treated steel shaft is recommended in rotation operation and stainless steel and hardened chrome steel shaft is recommended in oscillation operation.

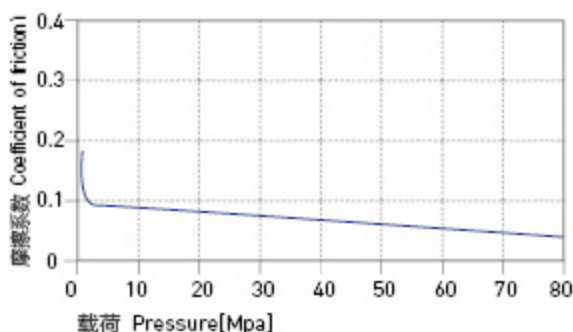
图表 HPP6-4: 摩擦系数与速度变化关系图表 P=2MPa

Graph HPP4-4: Coefficient of friction & the speed of bearing, P=2Mpa



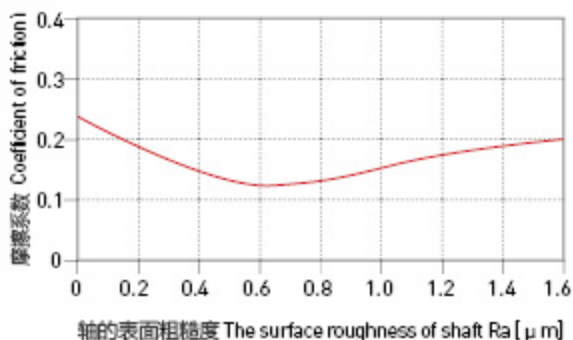
图表 HPP6-5: 摩擦系数与载荷变化关系图表 v=0.2m/s

Graph HPP4-5: Coefficient of friction & the pressure of bearing, v=0.2m/s



图表 HPP6-6: 摩擦系数与轴的表面粗糙度关系图表

Graph HPP4-6: Coefficient of friction & the surface roughness of shaft



HPP6-工程塑料轴承 Plastic Plain Bearings

轴承的摩擦系数、磨损、轴材料 Friction Factor, Wear And Shaft Material

■ 化学抗性 Chemical Resistance

HPP6塑料轴承能抵抗弱酸、弱碱以及各类润滑油的腐蚀。

HPP6 is good at chemical resistance against mild base, weak acidic medium and various kinds of lubricants.

■ 吸水性 Water Absorbability

在标准大气压中，HPP6塑料轴承的吸水率为0.3%，浸泡水中最大平衡吸水率为1.1%；因此材料不会吸水而发生性能和尺寸变化，适合用于潮湿环境。

The water absorb rate of HPP6 is less than 0.3% under the atmospheric pressure while it is 1.1% when the material is immersed into water. The material performance and dimensions of the material is stabilized for the applications under humid environment.

■ 抗UV性能 UV Resistance

HPP6长久暴露在紫外线下材料性能会逐渐下降。

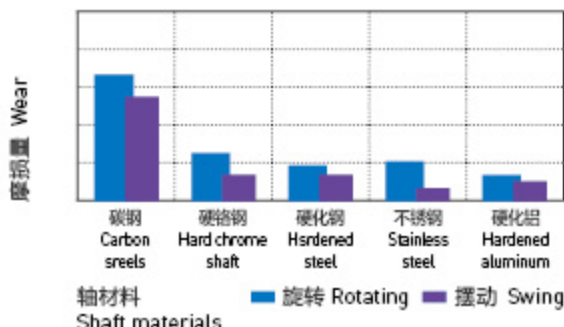
The material performance of HPP6 will be lowered if it id exposed in the UV ray for long period.

■ 安装公差 Installation Tolerances

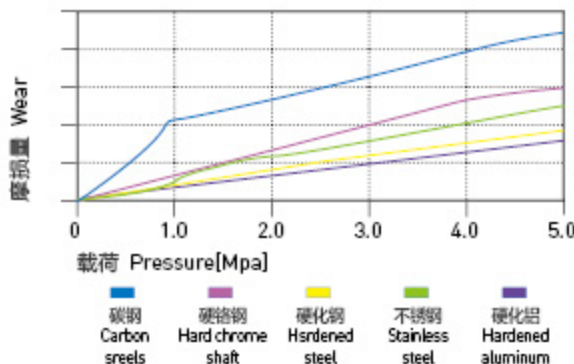
HPP6塑料轴承压装后公差Tolerances after pressfit

直径 Di. [mm]	HPP6 E10 [mm]	座孔 Housing H7 [mm]	轴 Shaft h9 [mm]
> 0-3	+0.014~+0.054	0~+0.010	0~-0.025
> 3-6	+0.020~+0.068	0~+0.012	0~-0.030
> 6-10	+0.025~+0.083	0~+0.015	0~-0.036
> 10-18	+0.032~+0.102	0~+0.018	0~-0.043
> 18-30	+0.040~+0.124	0~+0.021	0~-0.052
> 30-50	+0.050~+0.150	0~+0.025	0~-0.062
> 50-80	+0.060~+0.180	0~+0.030	0~-0.074
> 80-120	+0.072~+0.212	0~+0.035	0~-0.087
> 120-180	+0.085~+0.245	0~+0.040	0~-0.100

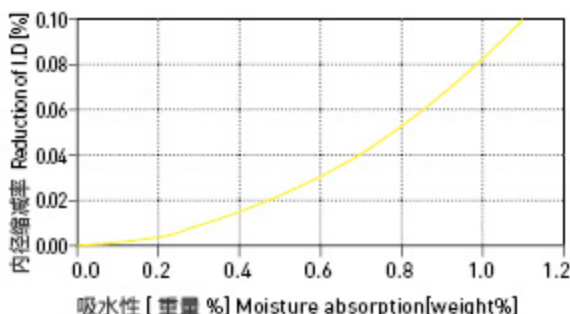
图表 HPP6-7: 在不同轴材料上旋转时的磨损量 $P=2\text{MPa}$, $v=0.2\text{m/s}$
Graph HPP6-7: The bearing wear under rotating with different shaft materials, $p=2\text{MPa}$, $v=0.2\text{m/s}$



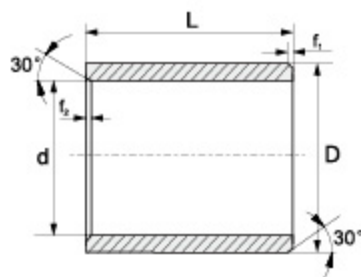
图表 HPP6-8: 旋转磨损随轴材料与压力变化关系 $v=0.2\text{m/s}$
Graph HPP6-8: The bearing wear & pressure under rotating with different shaft materials, $v=0.2\text{m/s}$



图表 HPP6-10: 吸水性的影响
Graph HPP6-10: Effect of moisture absorption on HPP6 bearings



HPP6标准规格Standard 直套Metric Cylindrical Bushings



推荐安装公差 Recommend fitting tolerance:

座孔 Housing: H7

轴 Shaft: h9

订购编码 Order P/N:

HPP6-0304-03

材料 Material

d D L

d	f ₁	f ₂
1-6	0.3	0.5
6-12	0.5	
12-30	0.8	
>30	1.2	

订购编码 Order PN	d [mm]	d-公差 After fitting [mm]	D [mm]	L(h13) [mm]
HPP6-0304-03	3	+0.014/+0.054	4.5	3
HPP6-0304-05	3	+0.014/+0.054	4.5	5
HPP6-0304-06	3	+0.014/+0.054	4.5	6
HPP6-0405-04	4	+0.02/+0.068	5.5	4
HPP6-0405-06	4	+0.02/+0.068	5.5	6
HPP6-0405-08	4	+0.02/+0.068	5.5	8
HPP6-0405-10	4	+0.02/+0.068	5.5	10
HPP6-0507-05	5	+0.02/+0.068	7	5
HPP6-0507-08	5	+0.02/+0.068	7	8
HPP6-0507-10	5	+0.02/+0.068	7	10
HPP6-0608-06	6	+0.02/+0.068	8	6
HPP6-0608-08	6	+0.02/+0.068	8	8
HPP6-0608-09	6	+0.02/+0.068	8	9
HPP6-0608-10	6	+0.02/+0.068	8	10
HPP6-0608-11	6	+0.02/+0.068	8	11
HPP6-0810-06	8	+0.025/+0.083	10	6
HPP6-0810-08	8	+0.025/+0.083	10	8
HPP6-0810-10	8	+0.025/+0.083	10	10
HPP6-0810-12	8	+0.025/+0.083	10	12
HPP6-0810-13	8	+0.025/+0.083	10	13
HPP6-0810-15	8	+0.025/+0.083	10	15
HPP6-0810-21	8	+0.025/+0.083	10	21
HPP6-1012-04	10	+0.025/+0.083	12	4
HPP6-1012-06	10	+0.025/+0.083	12	6
HPP6-1012-08	10	+0.025/+0.083	12	8
HPP6-1012-10	10	+0.025/+0.083	12	10
HPP6-1012-12	10	+0.025/+0.083	12	12
HPP6-1012-20	10	+0.025/+0.083	12	20
HPP6-1214-05	12	+0.032/+0.102	14	5
HPP6-1214-06	12	+0.032/+0.102	14	6
HPP6-1214-10	12	+0.032/+0.102	14	10
HPP6-1214-12	12	+0.032/+0.102	14	12
HPP6-1214-15	12	+0.032/+0.102	14	15
HPP6-1214-20	12	+0.032/+0.102	14	20
HPP6-1214-25	12	+0.032/+0.102	14	25
HPP6-1416-10	14	+0.032/+0.102	16	10
HPP6-1416-15	14	+0.032/+0.102	16	15

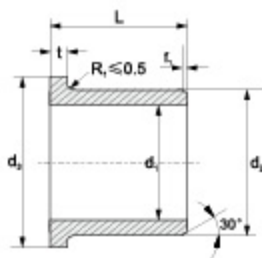
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HPP6-1416-20	14	+0.032/+0.102	16	20
HPP6-1416-25	14	+0.032/+0.102	16	25
HPP6-1517-10	15	+0.032/+0.102	17	10
HPP6-1517-20	15	+0.032/+0.102	17	20
HPP6-1517-25	15	+0.032/+0.102	17	25
HPP6-1618-08	16	+0.032/+0.102	18	8
HPP6-1618-15	16	+0.032/+0.102	18	15
HPP6-1618-20	16	+0.032/+0.102	18	20
HPP6-1618-25	16	+0.032/+0.102	18	25
HPP6-1820-20	18	+0.032/+0.102	20	20
HPP6-2022-15	20	+0.04/+0.124	22	15
HPP6-2023-10	20	+0.04/+0.124	23	10
HPP6-2023-15	20	+0.04/+0.124	23	15
HPP6-2023-20	20	+0.04/+0.124	23	20
HPP6-2023-23	20	+0.04/+0.124	23	23
HPP6-2023-30	20	+0.04/+0.124	23	30
HPP6-2225-15	22	+0.04/+0.124	25	15
HPP6-2225-20	22	+0.04/+0.124	25	20
HPP6-2225-25	22	+0.04/+0.124	25	25
HPP6-2225-30	22	+0.04/+0.124	25	30
HPP6-2528-12	25	+0.04/+0.124	28	12
HPP6-2528-20	25	+0.04/+0.124	28	20
HPP6-2528-25	25	+0.04/+0.124	28	25
HPP6-2528-30	25	+0.04/+0.124	28	30
HPP6-2832-20	28	+0.04/+0.124	32	20
HPP6-2832-25	28	+0.04/+0.124	32	25
HPP6-2832-30	28	+0.04/+0.124	32	30
HPP6-3034-20	30	+0.04/+0.124	34	20
HPP6-3034-25	30	+0.04/+0.124	34	25
HPP6-3034-30	30	+0.04/+0.124	34	30
HPP6-3034-40	30	+0.04/+0.124	34	40
HPP6-3236-20	32	+0.05/+0.15	36	20
HPP6-3236-30	32	+0.05/+0.15	36	30
HPP6-3236-40	32	+0.05/+0.15	36	40
HPP6-3539-20	35	+0.05/+0.15	39	20
HPP6-3539-30	35	+0.05/+0.15	39	30
HPP6-3539-40	35	+0.05/+0.15	39	40

订购编码 Order PN	d [mm]	d- 公差 After fitting [mm]	D [mm]	L(h13) [mm]
HPP6-3539-50	35	+0.05/+0.15	39	50
HPP6-4044-20	40	+0.05/+0.15	44	20
HPP6-4044-30	40	+0.05/+0.15	44	30
HPP6-4044-40	40	+0.05/+0.15	44	40
HPP6-4044-50	40	+0.05/+0.15	44	50

订购编码 Order PN	d [mm]	d- 公差 After fitting [mm]	D [mm]	L(h13) [mm]
HPP6-5055-40	50	+0.05/+0.15	55	40
HPP6-5055-50	50	+0.05/+0.15	55	50

*d 公差为压入标准 H7 座孔 (ISO3547-1) 后公差
 *Tolerance d: after being pressed into housing H7(ISO3547-1)

翻边轴套 Metric Flange Bushings



推荐安装公差 Recommend fitting tolerance:
 座孔 Housing: H7
 轴 Shaft: h9
 订购编码 Order P/N:

HPP6 F-0304-03
 翻边轴套 Flange bushes
 材料 Material

d	f
1-6	0.3
6-12	0.5
12-30	0.8
>30	1.2

订购编码 Order PN	d ₁ [mm]	d ₁ - 公差 After fitting [mm]	d ₂ [mm]	d ₃ [d13] [mm]	L[h13] [mm]	t _{0.14} [mm]
HPP6F-0304-03	3	+0.014/+0.054	4.5	7.5	3	0.75
HPP6F-0304-05	3	+0.014/+0.054	4.5	7.5	5	0.75
HPP6F-0405-03	4	+0.02/+0.068	5.5	9.5	3	0.75
HPP6F-0405-04	4	+0.02/+0.068	5.5	9.5	4	0.75
HPP6F-0405-06	4	+0.02/+0.068	5.5	9.5	6	0.75
HPP6F-0506-15	5	+0.02/+0.068	6	10	15	0.5
HPP6F-0507-04	5	+0.02/+0.068	7	11	4	1
HPP6F-0507-05	5	+0.02/+0.068	7	11	5	1
HPP6F-0507-10	5	+0.02/+0.068	7	11	10	1
HPP6F-0608-04	6	+0.02/+0.068	8	12	4	1
HPP6F-0608-06	6	+0.02/+0.068	8	12	6	1
HPP6F-0608-08	6	+0.02/+0.068	8	12	8	1
HPP6F-0608-10	6	+0.02/+0.068	8	12	10	1
HPP6F-0810-04	8	+0.025/+0.083	10	15	4	1
HPP6F-0810-05	8	+0.025/+0.083	10	15	5	1
HPP6F-0810-07	8	+0.025/+0.083	10	15	7	1
HPP6F-0810-08F2.5	8	+0.025/+0.083	10	15	8	2.5
HPP6F-0810-09	8	+0.025/+0.083	10	15	9	1
HPP6F-0810-10	8	+0.025/+0.083	10	15	10	1
HPP6F-0810-30	8	+0.025/+0.083	10	15	30	1
HPP6F-1012-06	10	+0.025/+0.083	12	18	6	1
HPP6F-1012-07	10	+0.025/+0.083	12	18	7	1
HPP6F-1012-10	10	+0.025/+0.083	12	18	10	1
HPP6F-1012-12	10	+0.025/+0.083	12	18	12	1
HPP6F-1012-15	10	+0.025/+0.083	12	18	15	1
HPP6F-1012-17	10	+0.025/+0.083	12	18	17	1

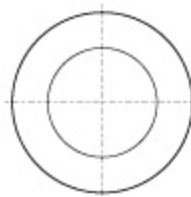
订购编码 Order PN	d ₁ [mm]	d ₁ - 公差 After fitting [mm]	d ₂ [mm]	d ₃ [d13] [mm]	L[h13] [mm]	t _{0.14} [mm]
HPP6F-1214-04	12	+0.032/+0.102	14	18	4	1
HPP6F-1214-07	12	+0.032/+0.102	14	20	7	1
HPP6F-1214-09	12	+0.032/+0.102	14	20	9	1
HPP6F-1214-10	12	+0.032/+0.102	14	20	10	1
HPP6F-1214-11	12	+0.032/+0.102	14	20	11	1
HPP6F-1214-12	12	+0.033/+0.102	14	20	12	1
HPP6F-1214-15	12	+0.032/+0.102	14	20	15	1
HPP6F-1214-17	12	+0.032/+0.102	14	20	17	1
HPP6F-1214-20	12	+0.032/+0.102	14	20	20	1
HPP6F-1416-12	14	+0.032/+0.102	16	22	12	1
HPP6F-1416-17	14	+0.032/+0.102	16	22	17	1
HPP6F-1517-12	15	+0.032/+0.102	17	23	12	1
HPP6F-1517-17	15	+0.032/+0.102	17	23	17	1
HPP6F-1517-20	15	+0.032/+0.102	17	23	20	1
HPP6F-1618-09	16	+0.032/+0.102	18	24	9	1
HPP6F-1618-12	16	+0.032/+0.102	18	24	12	1
HPP6F-1618-17	16	+0.032/+0.102	18	24	17	1
HPP6F-1820-17	18	+0.032/+0.102	20	26	17	1
HPP6F-1820-22	18	+0.032/+0.102	20	26	22	1
HPP6F-2023-11.5	20	+0.04/+0.124	23	30	11.5	1.5
HPP6F-2023-16.5	20	+0.04/+0.124	23	30	16.5	1.5
HPP6F-2023-21.5	20	+0.04/+0.124	23	30	21.5	1.5
HPP6F-2528-11.5	25	+0.04/+0.124	28	35	11.5	1.5
HPP6F-2528-16.5	25	+0.04/+0.124	28	35	16.5	1.5
HPP6F-2528-21.5	25	+0.04/+0.124	28	35	21.5	1.5
HPP6F-3034-16	30	+0.04/+0.124	34	42	16	2

订购编码 Order PN	d ₁ [mm]	d ₁ -公差 After fitting [mm]	d ₂ [mm]	d ₃ [d13] [mm]	L[h13] [mm]	t _{0.15} [mm]
HPP6F-3034-26	30	+0.04/+0.124	34	42	26	2
HPP6F-3034-37	30	+0.04/+0.124	34	42	37	2
HPP6F-3236-16	32	+0.05/+0.15	36	40	16	2
HPP6F-3236-26	32	+0.05/+0.15	36	40	26	2
HPP6F-3539-09	35	+0.05/+0.15	39	47	9	2
HPP6F-3539-16	35	+0.05/+0.15	39	47	16	2
HPP6F-3539-26	35	+0.05/+0.15	39	47	26	2

订购编码 Order PN	d ₁ [mm]	d ₁ -公差 After fitting [mm]	d ₂ [mm]	d ₃ [d13] [mm]	L[h13] [mm]	t _{0.15} [mm]
HPP6F-4044-30	40	+0.05/+0.15	44	52	30	2
HPP6F-4550-50	45	+0.05/+0.15	50	58	50	2
HPP6F-5055-40	50	+0.05/+0.15	55	63	40	2

*d₁公差为压入标准 H7 座孔 (ISO3547-1) 后公差*Tolerance d₁: after being pressed into housing H7(ISO3547-1)

垫片 Metric Thrust Washers



订购编码 Order PN:

HPP6 W-0509-006

d	D	T	垫片 Washer	
材料		Material		

订购编码 Order PN	d ^{+0.25} [mm]	D _{-0.25} [mm]	T _{-0.05} [mm]
HPP6W-0509-006	5	9	0.6
HPP6W-0615-015	6	15	1.5
HPP6W-0620-015	6	20	1.5
HPP6W-0815-005	8	15	0.5
HPP6W-0815-015	8	15	1.5
HPP6W-0818-005	8	18	0.5
HPP6W-0818-010	8	18	1.0
HPP6W-0818-015	8	18	1.5
HPP6W-1018-010	10	18	1.0
HPP6W-1018-015	10	18	1.5
HPP6W-1018-020	10	18	2.0
HPP6W-1224-012	12	24	1.2
HPP6W-1224-015	12	24	1.5
HPP6W-1426-015	14	26	1.5
HPP6W-1524-015	15	24	1.5

订购编码 Order PN	d ^{+0.25} [mm]	D _{-0.25} [mm]	T _{-0.05} [mm]
HPP6W-1630-015	16	30	1.5
HPP6W-1832-015	18	32	1.5
HPP6W-2032-010	20	32	1.0
HPP6W-2036-015	20	36	1.5
HPP6W-2238-015	22	38	1.5
HPP6W-2442-015	24	42	1.5
HPP6W-2644-015	26	44	1.5
HPP6W-2848-015	28	48	1.5
HPP6W-3254-015	32	54	1.5
HPP6W-3862-015	38	62	1.5
HPP6W-4266-015	42	66	1.5
HPP6W-4874-020	48	74	2.0
HPP6W-5278-020	52	78	2.0
HPP6W-6290-020	62	90	2.0

* 根据要求提供定位孔设计 The fixing bore design upon request