

## HPP31-工程塑料轴承 Plastic Plain Bearings

### 产品特性 Product Features

■ 中低载荷应用的低成本解决方案，同时此材料具有低吸水性率特性

■ 连续使用温度：-50℃/+100℃

■ 适用于中低载荷

■ 适台干运行免维护

■ 潮湿环境应用

■ 大批量、低成本

■ The solution of middle to low load application and economic effective requirement. It is also one of the low water absorbing materials

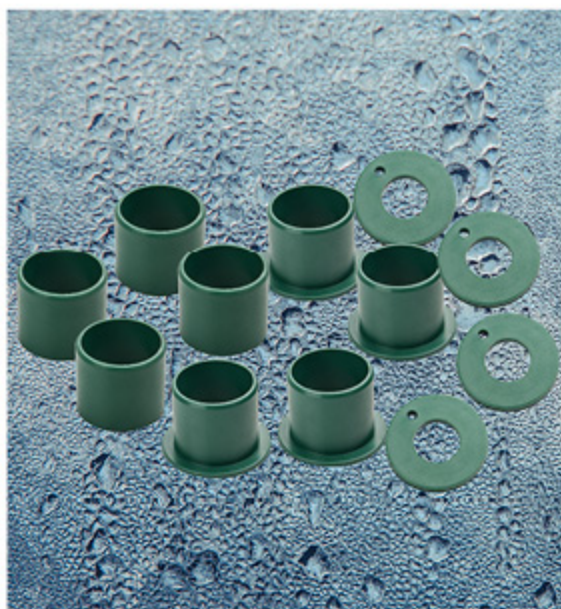
■ Continuous working temperature: -50℃/+100℃

■ Suitable for medium load operation

■ Maintenance-free dry operation

■ For wet conditions

■ Low cost material for high quantities



材料性能 Material Properties	试验方法 Testing Method	单位 Unit	HPP31
密度 Density	ISO1183	g/cm <sup>3</sup>	1.29
颜色 Color			橄榄绿 Olive
对钢的动摩擦系数 Dynamic friction/steel(dry)			0.07-0.20
最大 P.V 值 Max. PV (dry)		N/mm <sup>2</sup> × m/s	0.5
最大旋转速度值 Max. rotating velocity		m/s	1.0
最大摇摆速度值 Max. oscillating velocity		m/s	0.7
最大直线速度值 Max. linear velocity		m/s	3.0
抗拉强度 Tensile strength	ISO527	MPa	80
抗压强度 (轴向) Compressive strength(Axial)		MPa	70
弹性模量 E-module	ISO527	MPa	2400
允许最大表面静压力 (20℃) Max.static pressure of the surface, 20℃		MPa	60
邵氏硬度 Rockwell hardness	ISO868	D	75
连续工作温度 continuous work temperature		℃	-50/+100
短时运行温度 Short-time		℃	-50/+150
导热性 Thermal conductivity	ASTME1461	W/m × k	0.25
线性热膨胀系数 Linear coef. of thermal eapansion	ASTMD696	K <sup>-1</sup> × 10 <sup>-5</sup>	10
RH50/23℃时的吸湿性 Moisture absorption RH50/23℃	ASTMD570	%	0.2
最大吸水率 23℃ Max. water absorption, 23℃		%	0.4
燃烧性能 Flammability	UL94		HB
体电阻率 Volume resistivity	IEC60093	Ω cm	> 10 <sup>14</sup>
面电阻率 Surface resistivity	IEC60093	Ω	> 10 <sup>15</sup>

## HPP31-工程塑料轴承 Plastic Plain Bearings

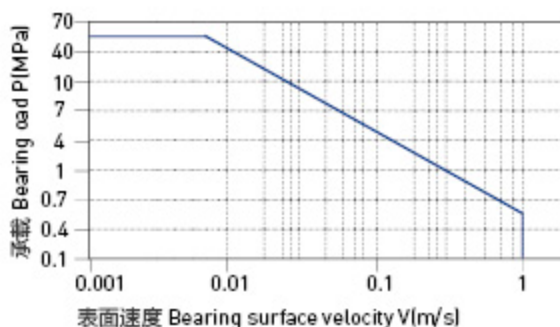
### 轴承PV值 PV Value

HPP31塑料轴承最大运行PV值为 $0.5\text{N/mm}^2 \times \text{m/s}$ ;由此决定轴承所承受的载荷与速度成反比,详情查阅图表HPP31-1。

The max PV value of the HPP31 series bearing is  $0.5\text{N/mm}^2 \times \text{m/s}$  which determines the load capacity of bearing is inversely proportional to the speed. Please refer to the chart for more detailed information (Graph HPP31-1).

图表 HPP31-1: PV 图表

Graph HPP31-1: Permissible PV value for HPP31



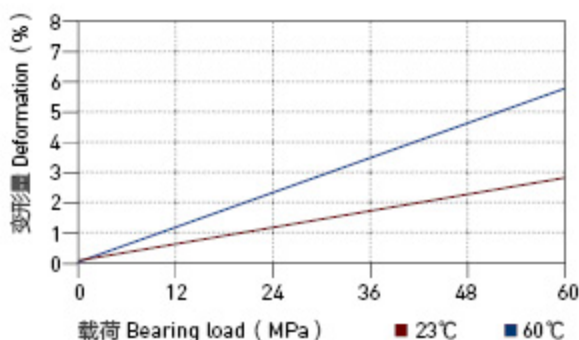
### 轴承的载荷、速度、温度 The Relation Of Load, Speed And Temperature

HPP31塑料轴承可承受最大静载荷为60Mpa,在此载荷下轴承的最大压缩变形量参考图表HPP31-2;轴承实际工作载荷小于60Mpa,载荷还受到运行速度以及温度的影响,速度越快 (Vmax: 1.0m/s)会导致摩擦温度上升,而温度上升 (Tmax: 100℃)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HPP31-3。

HPP31 allows the max static load of 60Mpa, The max compressive deformation rate under the max load is listed in Graph HPP31-2; The actual load capacity of bearing is slightly less than 60Mpa, The bearing load is variable against the speed and temperature, Fast speed (Vmax: 1.0m/s) results into higher temperature (Tmax: 100℃) which decreases the load capacity of the bearing. Please refer to the Graph HPP31-3 for such variation.

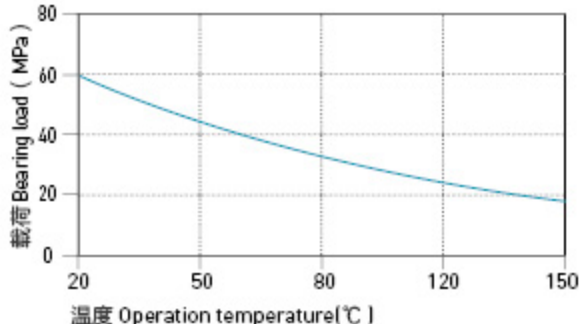
图表 HPP31-2: 载荷 - 温度 - 变形量图表

Graph HPP31-2: Load-Temperature deformation



图表 HPP31-3: 载荷 - 温度图表

Graph HPP31-3: Load-Temperature diagrams



## HPP31-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

与其它塑料轴承基本一样，图HPP31-4表明HPP31轴承在载荷保持不变的情况下摩擦系数随着运行速度的增加而升高；图HPP31-5表明HPP31轴承在保持速度不变时摩擦系数随着载荷的增加而逐步减低。根据图HPP31-6表明HPP31轴承的摩擦系数会随着轴表面粗糙度的变化而不同，我们推荐使用轴粗糙度为Ra0.3- 0.6 $\mu$ m；

Similar with most of the plastic bearings, the friction factor of HPP31 is increased along with the operation speed when the loading is stable (see Graph HPP31-4) and is decreased along with the loading increasing when the operation speed is stable (see Graph HPP31-5). From Graph HPP31-6, it shows the friction factor of HPP31 is variable against different shaft surface roughness. The recommended shaft surface roughness is Ra0.3-0.6.

HPP31	干运行 Dry	油脂 Grease	油 Oil	水 Water
摩擦系数 $\mu$ Friction coef.	0.08-0.20	0.09	0.04	0.04

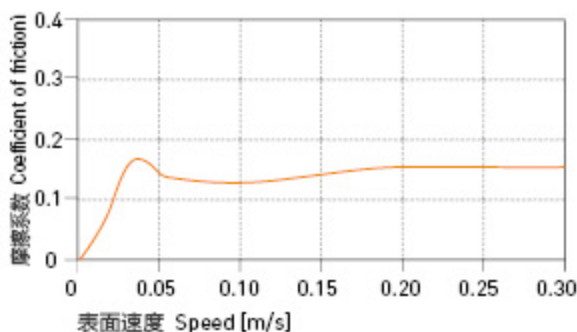
#### ■ 磨损与轴材料 Wearing and shaft material

图HPP31-7表明低载时硬化钢轴与硬铬钢轴比较适合用于HPP31轴承。HPP31在用于摆动运动时磨损值明显要优越于用于旋转运动。

Graph HPP31-7 shows that HPP31 is rather suitable for hardened steel shaft and hardened chrome steel shaft under lower loading and Graph HPP31-7 shows that HPP31 wearing feature is better for oscillation operation than of rotation operation.

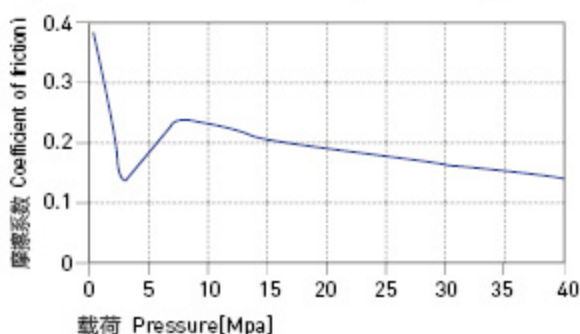
图表 HPP31-4: 摩擦系数与速度变化关系图表 P=2MPa

Graph HPP31-4: Coefficient of friction & the speed of bearing, P=2MPa



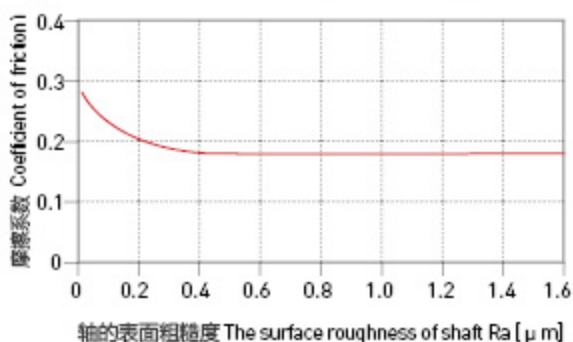
图表 HPP31-5: 摩擦系数与载荷变化关系图表 v=0.2m/s

Graph HPP31-5: Coefficient of friction & the pressure of bearing, v=0.2m/s



图表 HPP31-6: 摩擦系数与轴表面粗糙度关系图表

Graph HPP31-6: Coefficient of friction & the surface roughness of shaft





## HPP31-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

HPP31塑料轴承能抵抗部分弱酸以及各类润滑油的腐蚀。

HPP31 is good at chemical resistance against weak acidic medium and various kinds of lubricants.

#### ■ 吸水性 Water Absorbability

在标准大气压中, HPP31塑料轴承的吸水率极低为0.2%, 浸泡水中最大平衡率为0.4%; 由于其具有低吸水性率特性, 故此轴承可以用于一般潮湿环境。

The water absorb rate of HPP31 is 0.2% under the atmospheric pressure while it is 0.4% when the material is immersed into water. With its low water absorbability, the material is suitable for humid environment applications.

#### ■ 抗UV性能 UV Resistance

HPP31长久暴露在紫外线下颜色会发生褪变。材料性能会有所下降。

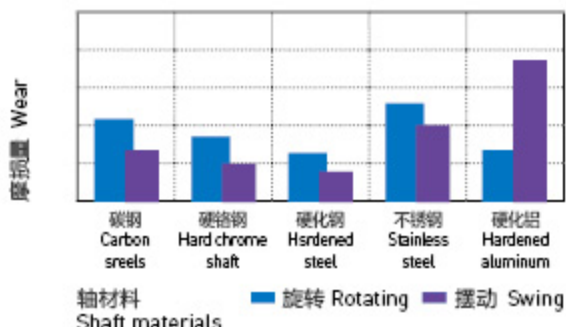
Disintegration could be possible for the material HPP31 after long period of exposing under the UV ray and therefore the performance of the material will be reduced.

#### ■ 安装公差 Installation Tolerances

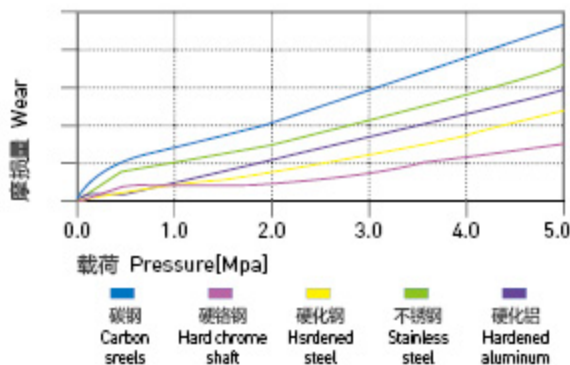
HPP31塑料轴承压装后公差Tolerances after pressfit

直径 Di. [ mm ]	HPP31 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

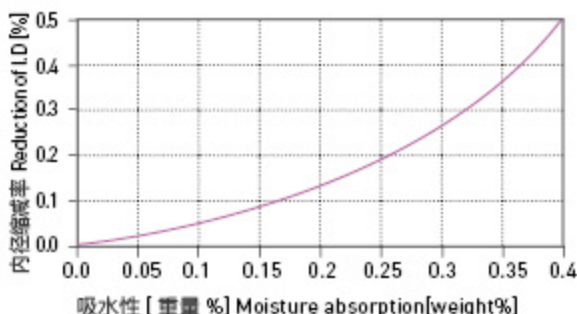
图表 HPP31-7: 在不同轴材料上旋转时的磨损量  $P=2\text{MPa}$ ,  $v=0.2\text{m/s}$   
Graph HPP31-7: The bearing wear under rotating with different shaft materials,  $p=2\text{MPa}$ ,  $v=0.2\text{m/s}$



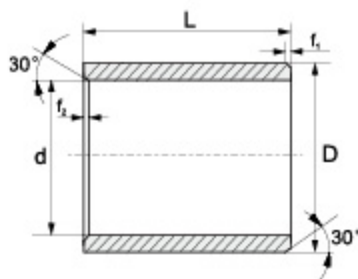
图表 HPP31-8: 旋转磨损随轴材料与压力变化关系  $v=0.2\text{m/s}$   
Graph HPP31-8: The bearing wear & pressure under rotating with different shaft materials,  $v=0.2\text{m/s}$



图表 HPP31-9: 吸水性的影响  
Graph HPP31-9: Effect of moisture absorption on HPP31 bearings



## HPP31 标准规格 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:

HPP31-0304-03

材料 Material

d	f <sub>1</sub>	f <sub>2</sub>
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]
HPP31-0304-03	3	+0.014/+0.054	4.5	3
HPP31-0304-05	3	+0.014/+0.054	4.5	5
HPP31-0304-06	3	+0.014/+0.054	4.5	6
HPP31-0305-05	3	+0.014/+0.054	5	5
HPP31-0405-04	4	+0.02/+0.068	5.5	4
HPP31-0405-06	4	+0.02/+0.068	5.5	6
HPP31-0405-08	4	+0.02/+0.068	5.5	8
HPP31-0406-06	4	+0.02/+0.068	6	6
HPP31-0507-05	5	+0.02/+0.068	7	5
HPP31-0507-08	5	+0.02/+0.068	7	8
HPP31-0507-10	5	+0.02/+0.068	7	10
HPP31-0507-12	5	+0.02/+0.068	7	12
HPP31-0507-18	5	+0.02/+0.068	7	18
HPP31-0608-04	6	+0.02/+0.068	8	4
HPP31-0608-05	6	+0.02/+0.068	8	5
HPP31-0608-06	6	+0.02/+0.068	8	6
HPP31-0608-08	6	+0.02/+0.068	8	8
HPP31-0608-10	6	+0.02/+0.068	8	10
HPP31-0608-11	6	+0.02/+0.068	8	11
HPP31-0810-05	8	+0.025/+0.083	10	5
HPP31-0810-06	8	+0.025/+0.083	10	6
HPP31-0810-08	8	+0.025/+0.083	10	8
HPP31-0810-10	8	+0.025/+0.083	10	10
HPP31-0810-11	8	+0.025/+0.083	10	11
HPP31-0810-12	8	+0.025/+0.083	10	12
HPP31-0810-15	8	+0.025/+0.083	10	15
HPP31-0811-10	8	+0.025/+0.083	11	10
HPP31-0812-10	8	+0.025/+0.083	12	10
HPP31-0911-06	9	+0.025/+0.083	11	6
HPP31-1012-04	10	+0.025/+0.083	12	4
HPP31-1012-05	10	+0.025/+0.083	12	5
HPP31-1012-06	10	+0.025/+0.083	12	6
HPP31-1012-08	10	+0.025/+0.083	12	8
HPP31-1012-10	10	+0.025/+0.083	12	10
HPP31-1012-12	10	+0.025/+0.083	12	12

订购编码 Order PN	d [mm]	d- 公差 After fitting [mm]	D [mm]	L(h13) [mm]
HPP31-1012-15	10	+0.025/+0.083	12	15
HPP31-1014-10	10	+0.025/+0.083	14	10
HPP31-1014-16	10	+0.025/+0.083	14	16
HPP31-1012-18	10	+0.025/+0.083	12	18
HPP31-1012-20	10	+0.025/+0.083	12	20
HPP31-1214-06	12	+0.032/+0.102	14	6
HPP31-1214-08	12	+0.032/+0.102	14	8
HPP31-1214-10	12	+0.032/+0.102	14	10
HPP31-1214-12	12	+0.032/+0.102	14	12
HPP31-1214-15	12	+0.032/+0.102	14	15
HPP31-1214-20	12	+0.032/+0.102	14	20
HPP31-1214-25	12	+0.032/+0.102	14	25
HPP31-1214-30	12	+0.032/+0.102	14	30
HPP31-1215-20	12	+0.032/+0.102	15	20
HPP31-1216-12	12	+0.032/+0.102	16	12
HPP31-1315-07	13	+0.032/+0.102	15	7
HPP31-1315-10	13	+0.032/+0.102	15	10
HPP31-1416-08	14	+0.032/+0.102	16	8
HPP31-1416-10	14	+0.032/+0.102	16	10
HPP31-1416-12	14	+0.032/+0.102	16	12
HPP31-1416-15	14	+0.032/+0.102	16	15
HPP31-1416-20	14	+0.032/+0.102	16	20
HPP31-1416-25	14	+0.032/+0.102	16	25
HPP31-1517-10	15	+0.032/+0.102	17	10
HPP31-1517-12	15	+0.032/+0.102	17	12
HPP31-1517-15	15	+0.032/+0.102	17	15
HPP31-1517-17	15	+0.032/+0.102	17	17
HPP31-1517-20	15	+0.032/+0.102	17	20
HPP31-1517-25	15	+0.032/+0.102	17	25
HPP31-1618-10	16	+0.032/+0.102	18	10
HPP31-1618-12	16	+0.032/+0.102	18	12
HPP31-1618-15	16	+0.032/+0.102	18	15
HPP31-1618-20	16	+0.032/+0.102	18	20
HPP31-1618-25	16	+0.032/+0.102	18	25
HPP31-1619-5.5S	16	+0.015/+0.055	19	5.5

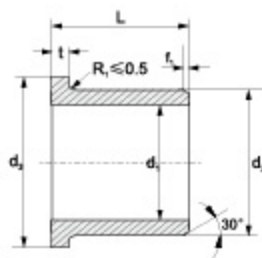
订购编码 Order PN	d [mm]	d- 公差 After fitting [mm]	D [mm]	L(h13) [mm]
HPP31-1620-16	16	+0.032/+0.102	20	16
HPP31-1820-15	18	+0.032/+0.102	20	15
HPP31-1820-20	18	+0.032/+0.102	20	20
HPP31-1820-25	18	+0.032/+0.102	20	25
HPP31-2022-12	20	+0.04/+0.124	22	12
HPP31-2022-15	20	+0.04/+0.124	22	15
HPP31-2022-28	20	+0.04/+0.124	22	28
HPP31-2023-10	20	+0.04/+0.124	23	10
HPP31-2023-15	20	+0.04/+0.124	23	15
HPP31-2023-20	20	+0.04/+0.124	23	20
HPP31-2023-23	20	+0.04/+0.124	23	23
HPP31-2023-25	20	+0.04/+0.124	23	25
HPP31-2023-30	20	+0.04/+0.124	23	30
HPP31-2025-15	20	+0.04/+0.124	25	15
HPP31-2225-15	22	+0.04/+0.124	25	15
HPP31-2225-20	22	+0.04/+0.124	25	20
HPP31-2225-25	22	+0.04/+0.124	25	25
HPP31-2225-30	22	+0.04/+0.124	25	30
HPP31-2528-10	25	+0.04/+0.124	28	10
HPP31-2528-12	25	+0.04/+0.124	28	12
HPP31-2528-15	25	+0.04/+0.124	28	15
HPP31-2528-20	25	+0.04/+0.124	28	20
HPP31-2528-25	25	+0.04/+0.124	28	25
HPP31-2528-30	25	+0.04/+0.124	28	30
HPP31-252925	25	+0.04/+0.124	29	25
HPP31-2530-25	25	+0.02/+0.104	30	25
HPP31-2832-20	28	+0.04/+0.124	32	20
HPP31-2832-25	28	+0.04/+0.124	32	25
HPP31-2832-30	28	+0.04/+0.124	32	30
HPP31-3034-20	30	+0.04/+0.124	34	20
HPP31-3034-25	30	+0.04/+0.124	34	25
HPP31-3034-30	30	+0.04/+0.124	34	30
HPP31-3034-40	30	+0.04/+0.124	34	40

订购编码 Order PN	d [mm]	d- 公差 After fitting [mm]	D [mm]	L(h13) [mm]
HPP31-3236-20	32	+0.05/+0.15	36	20
HPP31-3236-23	32	+0.05/+0.15	36	23
HPP31-3236-25	32	+0.05/+0.15	36	25
HPP31-3236-30	32	+0.05/+0.15	36	30
HPP31-3236-40	32	+0.05/+0.15	36	40
HPP31-3539-15	35	+0.05/+0.15	39	15
HPP31-3539-20	35	+0.05/+0.15	39	20
HPP31-3539-25	35	+0.05/+0.15	39	25
HPP31-3539-30	35	+0.05/+0.15	39	30
HPP31-3539-40	35	+0.05/+0.15	39	40
HPP31-3539-50	35	+0.05/+0.15	39	50
HPP31-4044-20	40	+0.05/+0.15	44	20
HPP31-4044-30	40	+0.05/+0.15	44	30
HPP31-4044-40	40	+0.05/+0.15	44	40
HPP31-4044-50	40	+0.05/+0.15	44	50
HPP31-4550-30	45	+0.05/+0.15	50	30
HPP31-4550-40	45	+0.05/+0.15	50	40
HPP31-4550-50	45	+0.05/+0.15	50	50
HPP31-5055-10	50	+0.05/+0.15	55	10
HPP31-5055-20	50	+0.05/+0.15	55	20
HPP31-5055-30	50	+0.05/+0.15	55	30
HPP31-5055-40	50	+0.05/+0.15	55	40
HPP31-5055-50	50	+0.05/+0.15	55	50
HPP31-5456-30	54	+0.060/+0.180	56	30
HPP31-6065-50	60	+0.060/+0.180	65	50
HPP31-7075-50	70	+0.060/+0.180	75	50
HPP31-8085-40	80	+0.060/+0.180	85	40
HPP31-8590-40	85	+0.072/+0.212	90	40
HPP31-125130-60S	125	+0.043/+0.143	130	60
HPP31-150155-60S	150	+0.043/+0.143	155	60

\*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:

HPP31 F-0304-03

材料 Material  
 翻边轴套 Flange bushes

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



订购编号 Order PN	d <sub>1</sub> [mm]	d <sub>1</sub> -公差 After fitting [mm]	d <sub>2</sub> [mm]	d <sub>2</sub> [d13] [mm]	L[h13] [mm]	t <sub>0.12</sub> [mm]
HPP31F-0304-03	3	+0.014/+0.054	4.5	7.5	3	0.75
HPP31F-0304-05	3	+0.014/+0.054	4.5	7.5	5	0.75
HPP31F-0405-03	4	+0.02/+0.068	5.5	9.5	3	0.75
HPP31F-0405-06	4	+0.02/+0.068	5.5	9.5	6	0.75
HPP31F-0507-03	5	+0.02/+0.068	7	11	3	1
HPP31F-0507-04	5	+0.02/+0.068	7	11	4	1
HPP31F-0507-05	5	+0.02/+0.068	7	11	5	1
HPP31F-0608-04	6	+0.02/+0.068	8	12	4	1
HPP31F0608-05	6	+0.02/+0.068	8	12	5	1
HPP31F-0608-06	6	+0.02/+0.068	8	12	6	1
HPP31F-0608-08	6	+0.02/+0.068	8	12	8	1
HPP31F-0608-10	6	+0.02/+0.068	8	12	10	1
HPP31F-0810-05	8	+0.025/+0.083	10	15	5	1
HPP31F-0810-06	8	+0.025/+0.083	10	15	6	1
HPP31F-0810-07	8	+0.025/+0.083	10	15	7	1
HPP31F-0810-09	8	+0.025/+0.083	10	15	9	1
HPP31F-0810-10	8	+0.025/+0.083	10	15	10	1
HPP31F-081014-12	8	+0.025/+0.083	10	14	12	1
HPP31F-081014-12F2	8	+0.025/+0.083	10	14	12	2
HPP31F-0810-12	8	+0.025/+0.083	10	15	12	1
HPP31F-081018-13	8	+0.025/+0.083	10	18	13	1
HPP31F-081017-15	8	+0.025/+0.083	10	17	15	1
HPP31F-081216-10	8	+0.013/+0.071	12	16	10	2
HPP31F-0912-10	9	+0.025/+0.083	12	18	10	2
HPP31F-1012-05	10	+0.025/+0.083	12	18	5	1
HPP31F-1012-06	10	+0.025/+0.083	12	18	6	1
HPP31F-1012-07	10	+0.025/+0.083	12	18	7	1
HPP31F-1012-08	10	+0.025/+0.083	12	18	8	1
HPP31F-1012-09	10	+0.025/+0.083	12	18	9	1
HPP31F-1012-10	10	+0.025/+0.083	12	18	10	1
HPP31F-1012-12	10	+0.025/+0.083	12	18	12	1
HPP31F-1012-15	10	+0.025/+0.083	12	18	15	1
HPP31F-1012-17	10	+0.025/+0.083	12	18	17	1
HPP31F-101216-12	10	+0.013/+0.071	12	16	12	2
HPP31F-101418-10	10	+0.013/+0.071	14	18	10	2
HPP31F-1214-04	12	+0.032/+0.102	14	20	4	1
HPP31F-1214-05	12	+0.032/+0.102	14	20	5	1
HPP31F-1214-06	12	+0.032/+0.102	14	20	6	1
HPP31F-1214-07	12	+0.032/+0.102	14	20	7	1
HPP31F-1214-09	12	+0.032/+0.102	14	20	9	1
HPP31F-1214-10	12	+0.032/+0.102	14	20	10	1
HPP31F-1214-12	12	+0.032/+0.102	14	20	12	1
HPP31F-1214-13	12	+0.032/+0.102	14	20	13	1
HPP31F-1214-15	12	+0.032/+0.102	14	20	15	1
HPP31F-1214-17	12	+0.032/+0.102	14	20	17	1
HPP31F-1214-18	12	+0.032/+0.102	14	20	18	1
HPP31F-1214-20	12	+0.032/+0.102	14	20	20	1
HPP31F121417-04	12	+0.032/+0.102	14	17	4	1
HPP31F-121417-05	12	+0.032/+0.102	14	17	5	1
HPP31F-121418-12F2	12	+0.016/+0.086	14	18	12	2
HPP31F-121418-25	12	+0.032/+0.102	14	18	25	1
HPP31F-121418-40F2	12	+0.016/+0.086	14	18	40	2
HPP31F-121620-10	12	+0.016/+0.086	16	20	10	2
HPP31F-121620-12	12	+0.016/+0.086	16	20	12	2

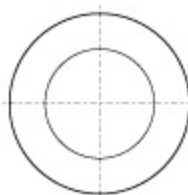
订购编号 Order PN	d <sub>1</sub> [mm]	d <sub>1</sub> -公差 After fitting [mm]	d <sub>2</sub> [mm]	d <sub>2</sub> [d13] [mm]	L[h13] [mm]	t <sub>0.12</sub> [mm]
HPP31F-131519-12	13	+0.032/+0.102	15	19	12	1
HPP31F1416-052	14	+0.032/+0.102	16	22	5.2	1
HPP31F-1416-08	14	+0.032/+0.102	16	22	8	1
HPP31F-1416-10	14	+0.032/+0.102	16	22	io	1
HPP31F-1416-12	14	+0.032/+0.102	16	22	12	1
HPP31F-1416-17	14	+0.032/+0.102	16	22	17	1
HPP31F-141620-06	14	+0.016/+0.086	16	20	6	2
HPP31F-141620-15	14	+0.016/+0.086	16	20	15	2
HPP31F-141822-20	14	+0.032/+0.102	18	22	20	2
HPP31F-151720-05	15	+0.032/+0.102	17	20	5	1
HPP31F-1517-09	15	+0.032/+0.102	17	23	9	1
HPP31F-1517-12	15	+0.032/+0.102	17	23	12	1
HPP31F-151720-12	15	+0.032/+0.102	17	20	12	1
HPP31F-1517-15	15	+0.032/+0.102	17	23	15	1
HPP31F-1517-17	15	+0.032/+0.102	17	23	17	1
HPP31F-1517-20	15	+0.032/+0.102	17	23	20	1
HPP31F-1518-12	15	+0.032/+0.102	18	23	12	1
HPP31F-1517-25	15	+0.032/+0.102	17	23	25	1
HPP31F-1618-12	16	+0.032/+0.102	18	24	12	1
HPP31F-1618-17	16	+0.032/+0.102	18	24	17	1
HPP31F-161822-22	16	+0.016/+0.086	18	22	22	2
HPP31F-162024-16	16	+0.016/+0.086	20	24	16	2
HPP31F-162024-22	16	+0.016/+0.086	20	24	22	2
HPP31F-1820-12	18	+0.032/+0.102	20	26	12	1
HPP31F-1820-17	18	+0.032/+0.102	20	26	17	1
HPP31F-1820-20	18	+0.032/+0.102	20	26	20	1
HPP31F-182024-22	18	+0.016/+0.086	20	24	22	2
HPP31F-2022-15	20	+0.04/+0.124	22	25	15	1.5
HPP31F-2023-11.5	20	+0.04/+0.124	23	30	11.5	1.5
HPP31F-2023-16.5	20	+0.04/+0.124	23	30	16.5	1.5
HPP31F-2023-21.5	20	+0.04/+0.124	23	30	21.5	1.5
HPP31F-2023-25	20	+0.04/+0.124	23	30	25	1.5
HPP31F-202330-15	20	+0.02/+0.104	23	30	15	2
HPP31F-202330-22	20	+0.02/+0.104	23	30	22	2
HPP31F-202430-20	20	+0.02/+0.104	24	30	20	2
HPP31F-202530-15	20	+0.02/+0.104	25	30	15	2
HPP31F-202732-20	20	+0.02/+0.104	27	32	20	2
HPP31F-2225-11.5	22	+0.04/+0.124	25	33	11.5	1.5
HPP31F-2528-11.5	25	+0.04/+0.124	28	35	11.5	1.5
HPP31F-2528-16.5	25	+0.04/+0.124	28	35	16.5	1.5
HPP31F-2528-21.5	25	+0.04/+0.124	28	35	21.5	1.5
HPP31F-252835-22	25	+0.02/+0.104	28	35	22	2
HPP31F-252835-32	25	+0.02/+0.104	28	35	32	2
HPP31F-253035-20	25	+0.02/+0.104	30	35	20	2.5
HPP31F-253035-25	25	+0.02/+0.104	30	35	25	2.5
HPP31F-303335-04	30	+0.02/+0.104	33	35	4	1
HPP31F-3034-09	30	+0.04/+0.124	34	42	9	2
HPP31F-3034-16	30	+0.04/+0.124	34	42	16	2
HPP31F-3034-26	30	+0.04/+0.124	34	42	26	2
HPP31F-3034-32	30	+0.04/+0.124	34	42	32	2
HPP31F-3034-37	30	+0.04/+0.124	34	42	37	2
HPP31F-303445-18	30	+0.02/+0.104	34	45	18	2
HPP31F-303445-22	30	+0.02/+0.104	34	45	22	2
HPP31F-303445-32	30	+0.04/+0.124	34	45	32	2

订购编码 Order PN	d <sub>1</sub> [mm]	d <sub>1</sub> -公差 After fitting [mm]	d <sub>2</sub> [mm]	d <sub>2</sub> [d13] [mm]	L[h13] [mm]	t <sub>±0.12</sub> [mm]
HPP31F-3236-16	32	+0.05/+0.15	36	40	16	2
HPP31F-3236-26	32	+0.05/+0.15	36	40	26	2
HPP31F-3539-16	35	+0.05/+0.15	39	47	16	2
HPP31F-3539-26	35	+0.05/+0.15	39	47	26	2
HPP31F-353950-22	35	+0.025/+0.125	39	50	22	2
HPP31F-4044-30	40	+0.05/+0.15	44	52	30	2
HPP31F-4044-40	40	+0.05/+0.15	44	52	40	2
HPP31F-404455-17	40	+0.025/+0.125	44	55	17	2
HPP31F-4550-25	45	+0.05/+0.15	50	58	25	2
HPP31F-4550-45	45	+0.05/+0.15	50	58	45	2
HPP31F-4550-50	45	+0.05/+0.15	50	58	50	2
HPP31F-455060-45	45	+0.025/+0.125	50	60	45	2.5
HPP31F-5055-20	50	+0.05/+0.15	55	63	20	2
HPP31F-5055-30	50	+0.05/+0.15	55	63	30	2

订购编码 Order PN	d <sub>1</sub> [mm]	d <sub>1</sub> -公差 After fitting [mm]	d <sub>2</sub> [mm]	d <sub>2</sub> [d13] [mm]	L[h13] [mm]	t <sub>±0.12</sub> [mm]
HPP31F-5055-40	50	+0.05/+0.15	55	63	40	2
HPP31F-5055-50	50	+0.05/+0.15	55	63	50	2
HPP31F-505563-50	50	+0.025/+0.125	55	63	50	2
HPP31F-505565-20.5	50	+0.025/+0.125	55	65	20.5	2.5
HPP31F-6065-60	60	+0.06/+0.18	65	73	60	2
HPP31F-657080-60	65	+0.03/+0.15	70	80	60	2.5
HPP31F-7075-50	70	+0.060/+0.180	75	83	50	2
HPP31F-758090-25	75	+0.030/+0.150	80	90	25	2.5
HPP31F-758090-40	75	+0.030/+0.150	80	90	40	2.5
HPP31F-9095110-50	90	+0.036/+0.176	95	110	50	2.5
HPP31F-120125140-50	120	+0.072/+0.212	125	140	50	2.5

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

## 垫片 Metric Thrust Washers



订购编码 Order PN:

HPP31 W-0509-006

HPP31 | W | 0509 | 006  
 材料 Material | 垫片 Washer | d | D | T

订购编码 Order PN	d <sup>+0.25</sup> [mm]	D <sub>-0.25</sub> [mm]	T <sub>-0.05</sub> [mm]
HPP31W-0509-006	5	9	0.6
HPP31W-0615-015	6	15	1.5
HPP31W-0620-015	6	20	1.5
HPP31W-0815-005	8	15	0.5
HPP31W-0815-015	8	15	1.5
HPP31W-0818-010	8	18	1.0
HPP31W-0818-015	8	18	1.5
HPP31W-1018-010	10	18	1.0
HPP31W-1018-015	10	18	1.5
HPP31W-1018-020	10	18	2.0
HPP31W-1024-015	10	24	1.5
HPP31W-1224-015	12	24	1.5
HPP31W-1226-015	12	26	1.5
HPP31W-1426-015	14	26	1.5
HPP31W-1430-015	14	30	1.5
HPP31W-1524-015	15	24	1.5
HPP31W-1630-015	16	30	1.5
HPP31W-1632-015	16	32	1.5
HPP31W-1832-015	18	32	1.5
HPP31W-1836-015	18	36	1.5

订购编码 Order PN	d <sup>+0.25</sup> [mm]	D <sub>-0.25</sub> [mm]	T <sub>-0.05</sub> [mm]
HPP31W-2030-015	20	30	1.5
HPP31W-2036-015	20	36	1.5
HPP31W-2038-015	20	38	1.5
HPP31W-2238-015	22	38	1.5
HPP31W-2242-015	22	42	1.5
HPP31W-2442-015	24	42	1.5
HPP31W-2444-015	24	44	1.5
HPP31W-2548-015	25	48	1.5
HPP31W-2644-015	26	44	1.5
HPP31W-2848-015	28	48	1.5
HPP31W-3054-015	30	54	1.5
HPP31W-3254-015	32	54	1.5
HPP31W-3662-015	36	62	1.5
HPP31W-3862-015	38	62	1.5
HPP31W-4266-015	42	66	1.5
HPP31W-4674-020	46	74	2.0
HPP31W-4874-020	48	74	2.0
HPP31W-5178-020	51	78	2.0
HPP31W-5278-020	52	78	2.0
HPP31W-6290-020	62	90	2.0