



京澎机械设备有限公司

Jingpeng Machinery & Equipment (Shanghai) Co., Ltd.

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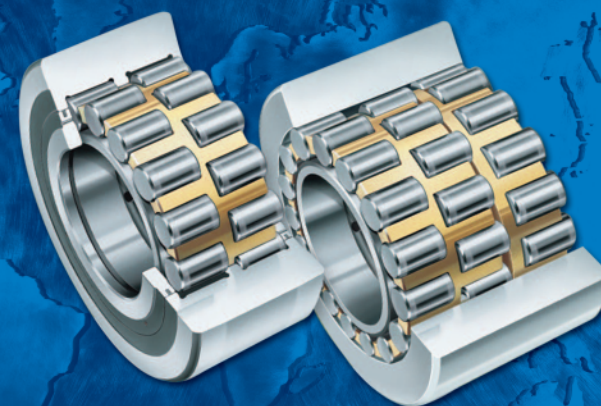
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行在他人运筹之先 动在他人准备之前
 Taking action before others planning
 operating before others preparation

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背衬轴承
 Backing bearings



京澎机械设备有限公司

JINGPENG MACHINERY & EQUIPMENT (SHANGHAI) CO., LTD.

公司简介 Brief Introduction to the Company

京澎机械设备（上海）有限公司成立于2003年。公司致力于“进口轴承更换”的研发和制造，决心在外观、精度和使用寿命上全面替代进口轴承。

公司拥有一支专业的技术服务队伍，技术人员比例达到30%以上。可生产 $\Phi 15\text{mm} \sim \Phi 2000\text{mm}$ 内径，可承接OEM和OEM生产。公司采用全自动数控生产线，同时建立完善的检测手段全跟踪、系统检测，并建立完善的检测设备，包括金相检验、轮廓检测仪、圆度仪、粗糙度仪和高精度测量中心。严格控制生产过程，保证轴承质量的稳定性和一致性。分析轴承在各种环境条件下的使用情况，以更好地满足客户的需求。公司的合作伙伴包括世界500强企业，产品畅销全球，远销美国、西班牙、土耳其、意大利、奥地利、巴西等十几个国家。

公司坚持“精益求精，精益求精，0.01%的产品就是100%的浪费！”，决心从外观、精度和使用寿命上彻底替代进口轴承。公司拥有自己的理化检测中心和实验室。产品从第一步到每一步都严格控制。每批产品都有详细的质量档案，追溯期长达五年。

Jingpeng Machinery & Equipment (Shanghai) Co., Ltd. was established in 2003. The company is committed to the R&D and manufacturing of "imported bearing replacement" and is determined to completely replace imported bearings in terms of appearance, precision and service life.

The company has a professional technical and service team with a technical staff ratio of more than 30%. It can produce an inner diameter of $\Phi 15\text{mm} - \Phi 2000\text{mm}$ and undertake OEM and OEM production. The company adopts fully automatic CNC production line, and at the same time establishes perfect inspection means Complete tracking, system inspection, and establishes perfect testing equipment including metallographic inspection, contour detector, roundness meter, roughness meter and high-precision measurement center. Strictly control the production process to ensure the stability and consistency of the bearing quality. And analyze the bearing usage under various environmental conditions to better meet the needs of customers. The company's partners include the world's top 500 companies, the products sell well all over the world, exported to the United States, Spain, Turkey, Italy, Austria, Brazil, etc. More than a dozen countries.

The company adheres to the quality policy of "excellence, perfection, 0.01% of the product is 100% waste!", determined to completely replace imported bearings from appearance, precision and service life. The company has its own physical and chemical laboratory and measurement and testing center. The products are strictly controlled from the first step to each step. Each batch of products has a detailed quality file with a retrospective period of up to five years.

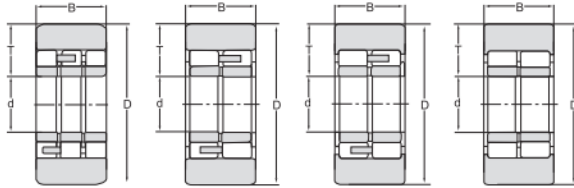


数控车间

CNC Workshop

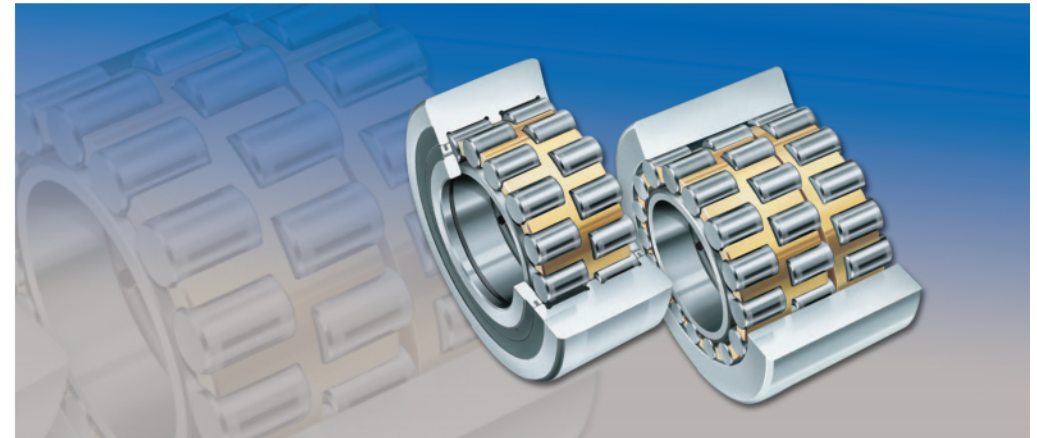


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基本尺寸 (mm) Boundary dimensions			说明 Instruction	轴承型号 Bearing No.			图样 Pattern	重量 Weight	
d	D	B		公司代号 Corporation Code	FAG	SKF		kg	
130	300	160	极限转速者详细参数 请至本公司技术部联系 For the information of the detailed parameters such as the rated load and limit rotate speed, please contact the technical department of our company.	NNCF2660159P4			1,1	66,5	
	300	160		NNCF2660160H			1,1	59,5	
	300	160		NNCF2660160J			1,1	67	
	300	171,6		NNCF2660171			2,3	69,8	
	300	172,6		NNCF2660172SKP4			2,2	69,8	
	300	172,64		NNCF2660170			314833A	1,1	71,42
	300	172,64		NNCF2660172				1,1	72,98
	300	170		NNCF2660168				1,4	67,3
	300,02	150		NNCF2660150	517384			1,1	62
	300,02	160		NNCF2660160	548314	319028		1,2	66
	300,02	172,64		C792726EK	548417	314833B		1,1	72,5
	300,02	172,65		549722P4X				2,4	69,02
	320	130		NNCF2664130Y				2,2	60,7
145	400	168	NNCF298034			1,1	130,5		
160	360,02	140	NNCF3272140	545300			1,1	80	
	406,42	167	NNCF3680170HC				1,1	126,8	
	406,42	170	NNCF3680170P4				1,1	131	
	406,42	170	NNCF3680170P4Y				1,1	131	
	406,4	170	NNCF3680171				2,3	126,5	
180	406,42	171	NNCF3680170X			BNTB322758/HB1	1,5	128,2	
	406,42	217	NNCF3680217	514278		315020A	1,1	160	
	406,42	224	NNCF3680224			BNTB322891/HB2	1,1	170	
	406,42	224	NNCF3680224Y				1,1	170	
	406,02	181	NNCF3680179HC				1,4	129	
	410	92,5	NNCF368292				1,1	59,8	
	410	235	NNCF3682235				1,1	170,2	
	205	520	152	NNCF41104152			2,1	198	
205	520	160	NNCF41104160				2,1	200,2	
	520	167	NNCF41104167				2,3	217,8	
	520	240	NNCF41104240HC				1,1	275,7	

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背衬轴承 Backing bearings

类型1的特点 图1

Features Of Type1-Figure1

外圈不带挡边，第一和第二列滚动体由双列梳状保持架引导，第三列滚动体由单列的梳状保持架引导。滚动体由位于内圈上的活动挡边进行轴向引导。此种背衬轴承不带密封。非密封轴承可适用轧制乳化液润滑；乳化液可以从轴承中均匀的无障碍流进和流出。

The outer ring does not have the flange, the rolling elements of the first row and the second row are guided by the biserial comb cage and the rolling elements of the third row are guided by the uniserial comb cage. The axial guiding of the rolling element is conducted by the movable flange on the inner ring. This kind of backing bearing does not have the sealing. The bearing without the sealing can be applicable to the rolling emulsion lubrication; the emulsion can flow in and out from the bearing without block.

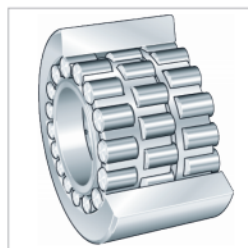


图1

类型2的特点 图2

Features Of Type2-Figure2

这些双列背衬轴承外圈有三个挡边。滚动体由双列梳状黄铜保持架引导。此类型轴承可适用于各种润滑方式(见第7页描述)。根据润滑方式不同，可提供不带密封或密封轴承。

There are three flanges in the outer ring of these biserial backing bearing. The rolling element is guided by the biserial comb cage. This kind of bearing is applicable to the entire lubrication mode (see in the description of page 7). The bearing with sealing or without sealing can be provided according to the different lubrication mode.

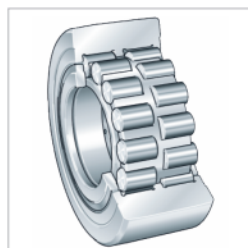


图2

类型3的特点 图3

Features Of Type3-Figure3

双列满装背衬轴承内圈和外圈都有中挡边。此种背衬轴承不带密封。可适用轧制乳化液润滑。

There is the flange in the inner ring and outer ring of the biserial full filled backing bearing. This kind of backing bearing does not have the sealing and it is applicable to the lubrication of emulsion.

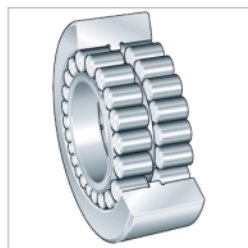


图3

设计原则 Design principle

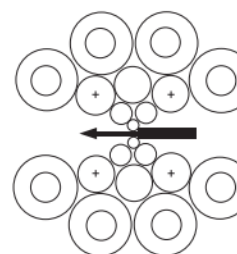
20辊轧机的力的传递取决于工作辊、中间辊和支撑辊的角度与直径比率。近似于如下的描述：
A、D、E和H轴受60%的轧制力
B、C、F和G轴受40%的轧制力

- 图标符号图4：
①支撑轴
②中间辊
③工作辊
④背衬轴承—类型2
⑤支撑座架

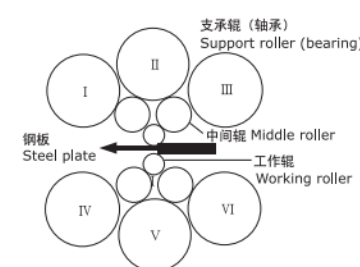
The transmission of the force of the 20 rolling mill depends on the angle and diameter ratio of the working roller, middle roller and supporting roller. It is similar to the following description:
Bearing A, D, E and H undertake 60% rolling force
Bearing B, C, F and G undertake 40% rolling force.

Figure 4 of graphical diagram

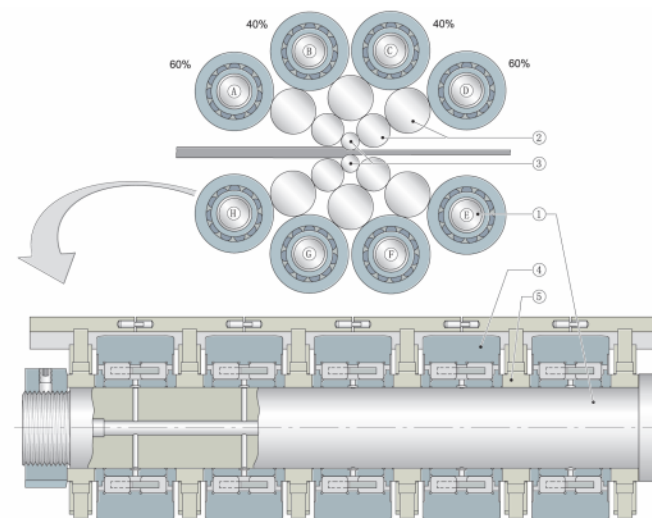
- ① Back shaft
② Middle roller
③ Working roller
④ Backing bearing-type2
⑤ Support bracket



20辊冷轧机工作原理
Working theory of 20-roller cold rolling mill



12辊冷轧机工作原理
Working theory of 12-roller cold rolling mill



安装和拆卸

背衬轴承内圈承受点载荷，在轴上安装时，采用松配合。

Installation and Disassembling

The inner ring of the backing bearing bears the point load and the loose fit shall be adopted in the installation on the axle.

注意!
一些背衬轴承没有自保持能力。为了防止滚动体掉落，调整时不能将内圈推出，在安装和拆卸过程中，轴承组件不可拆分或互换。

Caution!

Some backing bearing do not have the self-hold facility. The inner ring shall not be pushed in the adjustment to prevent the falling of the rolling element. The components of the bearing can not be disassembled or exchanged in the process of installation and disassembling.

截面高度分组

减小轧材的公差需要高的轴承精度，特别是对外圈的跳动和轴承的截面高度公差要求。这要求高的制造公差和各部件的公差组别分类来达到。背衬轴承被分成3到7个截面高度公差组别-I到VII-每个为3 μ m或5 μ m公差(表1)。

Grouping of the section height

The tolerance reduction of the mill bar needs the high bearing precision, especially the requirement of the tolerance of the outer ring runout and section height of the bearing. This relies on the grouping of the manufacturing tolerance with high requirement and the tolerance of all the components to reach.

The backing bearing is classified into 3 to 7 tolerance groups of section height I to VII-each one is 3 μ m or 5 μ m tolerance (Table 1)

表1 截面高度组别和公差

Table 1 Group and tolerance of section height

截面高度组别 型号	Group of section height	截面高度公差 μ m	Tolerance of section height
I		0	0
		-0.005	-0.005
II		-0.005	-0.005
		-0.010	-0.010
III		-0.010	-0.010
		-0.015	-0.015

每一个背衬轴承都有截面高度公差组别名称标示(图7)。标记位于内外圈最大壁厚处(图8)。为了减小内圈壁厚波动，在一个支撑轴上的所有轴承内圈标记必须在同样的位置。

Each backing bearing has the name marks of the group and tolerance of the section height (Figure 7). The mark is located at the maximum wall thickness (Figure 8). In order to reduce the fluctuation of the wall thickness of the inner ring, all the inner ring marks of the bearing must be in the same place on the back shaft.

注意!

安装在同一支撑轴上的所有背衬轴承必须是同一公差组别，见图7。

Caution!

All the backing bearings installed on the same back shaft must be in the same tolerance group, as Figure 7 is shown.

轴向定位-图9

一旦背衬轴承和支撑座被安装，所有支撑座、背衬轴承和支撑轴必须被轴向定位。

Axial location-Figure 9

Once the backing bearing and the support base is installed, all the support bases, backing bearing and support shaft must be located.

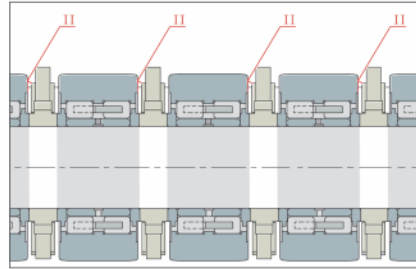


图7 · 截面高度分组标记
Figure 7 Grouping mark of the section height

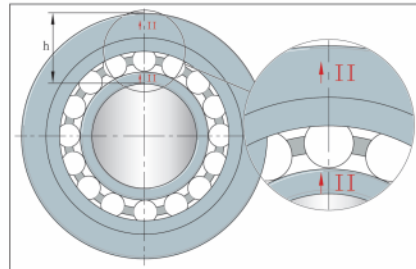


图8 · 最大壁厚处标记
Figure 8 Mark of the maximum wall thickness

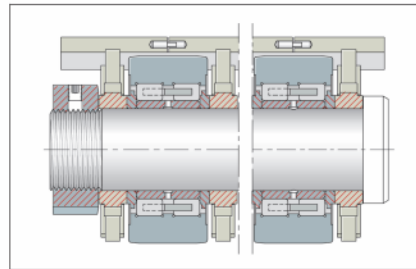


图9 · 支撑轴、背衬轴承和支撑座轴向定位
Figure 9 Back shaft, backing bearing and back axial location

润滑

润滑是一个设计要素。轧机背衬轴承设计时就应确定润滑剂和润滑方法。背衬轴承设计为润滑剂在滚动体上均布，这种情况下，采用轧制乳化液润滑时，乳化液可以无阻碍的从两侧流通。

Lubrication

The lubrication is a design factor. The lubricant and lubrication mode shall be confirmed in the design of the rolling mill backing bearing. The lubricant shall be uniformly distributed on the rolling element in the design backing bearing.

注意!

润滑方法，润滑剂的量和粘度取决于背衬轴承的工作条件。必须保证在轧机启动前就对背衬轴承进行润滑。

Caution!

The lubrication mode, the dose and viscosity of the lubricant is decided by the working conditions of the backing bearing. It must be ensured that the backing bearing is lubricated before the starting up of the rolling mill.

轧制乳化液润滑-图10

采用轧制乳化液润滑是最经济的，这一方法已在大量的轧机上使用。由于轧制乳化液的粘度较低，需要较大流量润滑油流过轴承。通过背衬轴承的高速润滑油防止了外部物质进入轴承。无密封的背衬轴承是适于轧制乳化液润滑的。

Rolling emulsion lubrication-Figure 10

Using the rolling emulsion lubrication is the most economic and this mode is always used in a lot of rolling mills. Since the viscosity of the rolling emulsion is very low, much lubrication oil is needed to flow through the bearing. The high-speed lubricant of the backing bearing can prevent the outer things from entering the bearing. The backing bearing without sealing is applicable to the rolling emulsion lubrication.

循环油润滑-图11

润滑油流过背衬轴承回到它自己的循环系统里。因此高粘度的油被使用。这种变化可以给背衬轴承寿命带来很大提高。必须注意进油孔和出油孔测量的设计。带有唇密封的轴承是适于循环油润滑的。

Recycle oil lubrication -Figure 11

The lubrication oil flows from the backing bearing to enter its own circulating system, thus the oil with high viscosity is used. This change will greatly improve the service life of the backing bearing. The design of the measurement of the oil inlet and oil outlet must be paid attention to. The bearing with the lip sealing is applicable to the recycle oil lubrication.

油气润滑-图12

利用清洁干燥的压缩空气将润滑油吹入轴承。由于间隙密封，在背衬轴承内产生轻微的压力防止了外界物质的入侵。油颗粒粘结于轴承内部表面，仅少量的油由排气孔逃出。粘度不小于 $\nu=220\text{mm}^2/\text{s}$ 润滑剂设计供应措施需和润滑设备制造商协商。带有间隙密封的轴承是适于油气润滑的。

Oil gas lubrication-Figure 12

The lubricating oil shall be blow into the bearing by the clean and dry pressed air. Since the gas sealing, the slight pressure produced in the backing bearing can prevent the intrusion of the external things. The oil particle will stick on the inner surface of the bearing and only a little oil will escape from the exhaust hole. The supply measures about the design of lubricant of which the viscosity is not less than $\nu=220\text{mm}^2/\text{s}$ shall be discussed with the manufacturer of the lubrication equipment. The bearing with the gap sealing is applicable to the oil gas lubrication.

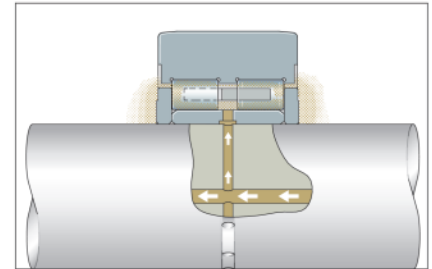


图10 · 轧制乳化液润滑-背衬轴承
Figure 10 Rolling emulsion lubrication-backing bearing

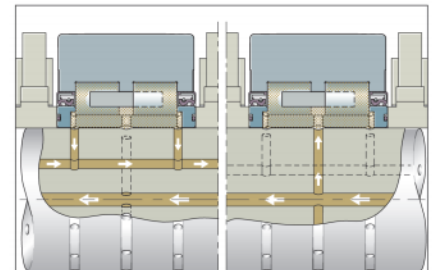


图11 · 循环油润滑-回转轴封的背衬轴承
Figure 11 Recycle lubrication- backing bearing of the rotary axial sealing

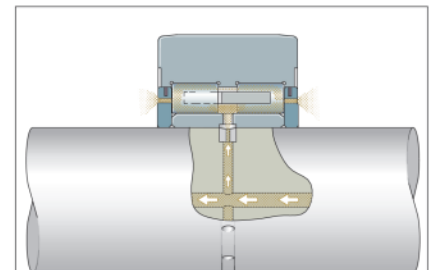


图12 · 油气润滑-间隙密封的背衬轴承
Figure 12 Oil gas lubrication-backing bearing with the gap sealing

维护

维护背衬轴承在运行一定时间之后必须检查。需将轴承从轴上拆下，检查损坏污染状况。

机架中的背衬轴承受不同的载荷。背衬轴承受较高载荷的支撑辊上的轴承，需要定期与承受较低载荷的支撑辊上的轴承互换。而且每次拆卸后安装时要将内圈旋转90°。这样可以使轴承的磨损保持均匀。

根据轧制材料所要求的质量，背衬轴承必须在限定的时间周期内检查，并且在必要时重新研磨外圈表面。

由于外圈特殊的热处理，外圈能够重新研磨几次而不损失硬度。这消除了磨痕、外来杂质导致的凹痕和磨损区域等，使表面平滑。建议阶段性的重新研磨。可联系我们咨询单独的重磨细节。

Maintenance

Maintenance: The backing bearing must be inspected when it operates for some time. The bearing shall be disassembled from the axle to check whether there is damage or pollution or not.

The backing bearing in the machine frame will bear the different loads. The bearing of the backing bearing on the support roller which bears the higher load shall be exchanged with the bearing on the support roller which bears the lower load. The inner ring shall be turned 90° in the installation after the disassembling in each time. The abrasion of the bearing can be kept uniformly in this way.

The backing bearing must be inspected in the limited time cycle according to the required quality of the rolling materials and the surface of the outer ring shall be grinded if it is necessary.

Since the heat treatment of the outer ring, the outer ring can conduct the regrinding without losing the hardness. This removes the indentation, wearing zone and others caused by the wear scar and foreign impurity to make the surface smooth. The stage regrinding is suggested. The independent regrinding details can be consulted through contacting us.

磨削心轴

类型2的重新研磨，可使用特殊的磨削心轴(图13)。心轴可协商供货。磨削心轴通过滚动体和外圈滚道对中背衬轴承。轧机上承受同样载荷运转功能的支撑辊轴承采用相同的磨削工艺。为了减小心轴的径向跳动，支撑辊轴承开始重磨前，磨削心轴的弹性卡环必须精磨。

Grinding mandrel

The special grinding mandrel (Figure 13) can be used in the regrinding of the type2. The mandrel can be provided through discussion.

The grinding mandrel focuses on the backing bearing through the rolling element and track of the outer ring. The same grinding technology is adopted in the bearing of the support roller which bears the same load operation on the rolling mill. In order to reduce the circular runout of the mandrel, the elastic clasp must be accurately grinded before the regrinding of the bearing of the support roller.

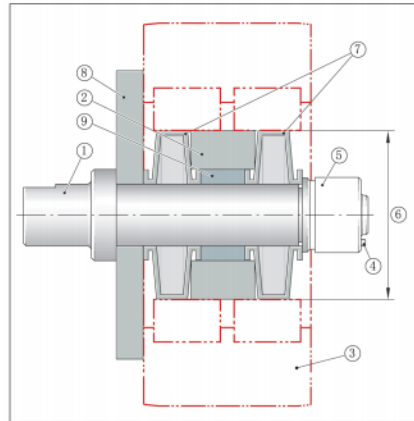
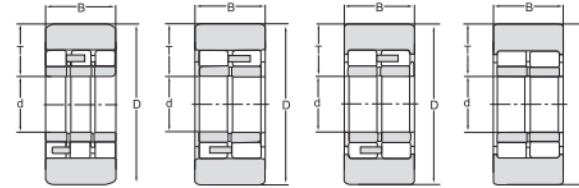


图 13 · 背衬轴承类型2的磨削装置
图例符号图13:

- ①磨削心轴
- ②塑料隔环
- ③背衬轴承
- ④扳手螺栓
- ⑤锁紧螺母
- ⑥背衬轴承包络线
- ⑦弹性卡环
- ⑧支撑垫圈
- ⑨隔环

Figure 13 Backing bearing type2
Figure 13 Type2 of the backing bearing
Figure 13 of graphical diagram:
①Grinding mandrel ②Plastic retainer
③Backing bearing ④Wrench bolt
⑤Locknut ⑥Envelope of backing bearing
⑦Elastic clasp ⑧Support washer
⑨Retainer



基本尺寸 (mm) Boundary dimensions			说明 Instruction	轴承型号 Bearing No.			图样 Pattern	重量 Weight	
d	D	B		公司代号 Corporation Code	FAG	SKF		kg	
30	90	50	额定负荷 For the information of the detailed parameters such as the rated load and limit rotate speed, please contact the technical department of our company. 极限转速等详细参数请与本公司技术部联系	NNCF061450			3,1		
40	110	32		NNCF082232			0,1	2,1	
55	120	52		NNCF112452		396040	2,2	3,5	
	120	64		NNCF112464			2,2	4,15	
70	160	74,2		NNCF143274	563882		1,1	8,7	
	160.02	90		NNCF143290	540268	315268B	1,1	10,5	
75	160	110		549715P4Y			1,1		
80	190	120		NNCF1638120			2,1		
	195	120		NNCF1639120			2,1		
85	185	105		NNCF1737105			2,1		
90	180	100		NNCF1836100			1,3	13,42	
	200,02	140		NNCF1840140			1,1	25,2	
	220,02	94		NNCF184494	540565	BC2B319343B	1,1	21,5	
	220,02	120		NNCF1844120	517329	316767A	2,1	27	
100	225	96		NNCF204596	540337		2,1	22	
	225	120		20DC23120	540700	315018A	1,1	28	
	225	120		NNCF2045120P4		315018C	1,1	26,8	
	260	105		NNCF2052105			1,1	32,7	
	110	260		110	260110P4			2,2	35
		260		110	NNCF2252110H			2,4	35,3
260		110	NNCF2252110HC			2,2	35,7		
260		110	NNCF2252110HY			2,3			
260	125	NNCF2252125	518101		2,1	40			
260	140	NNCF2252140	540060		2,1	45			
120	280	115	NNCF2803110			1,3	41		
	280,2	120	NNCF2256120			2,1	44,9		
	260	154	NNCF245231			1,1	46,56		
		160	549724P4			2,2			
130	280	100	NNCF2656100			2,1	35,13		
	290	100	NNCF2658100			2,1	38,42		