

Franke Wire Race Bearings for Circular Knitting Machines



Franke Worldwide – Partner in Technology and Service



Tradition since 1936

Erich Franke, an engineer, develops the Wire Race Bearing in 1936 while looking for a space-saving bearing solution for an optical device. He describes his invention as „a ball bearing with exceedingly low spatial requirements which easily satisfies the highest demands on a body's precision of movement in relation to another.“

Franke's first high-volume series production are wire race bearings for circular knitting machines. Over the years we have consistently enhanced his principle of four race rings. Today our product program includes rotative and linear components – with and without drive.

Modern and Innovative

The principle of four race rings integrated in a mating structure is still up to date. Our product solutions are always tailored to suit the specific application. From the concept to prototype construction and on to extensive test series testing, we engage at all times in close cooperation with our customers. This permits the manufacture of individual pieces and also series production. Today Franke acts as a specialist for customized designed bearings all over the world. In our company in Aalen, Germany, more than 200 people work together in research & design, production and administration.



Certificates

Our entire quality management is certified according to DIN EN ISO 9001. Sustainability is the connecting link in our entire value added chain. Our environmental management system satisfies the requirements defined in DIN ISO 14001. Documented processes in production and administration, external and internal audits also, guarantee a constantly high level of manufacturing quality. Our laboratory is equipped to conduct all necessary tests on resilience and service life. Samples and 100% inspections verify our efforts to deliver unbeatable product quality.

Franke Worldwide

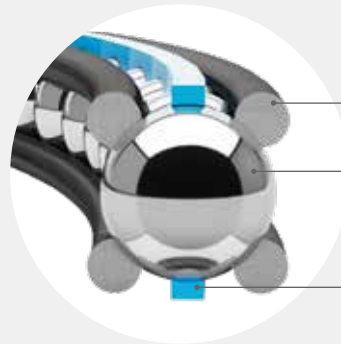
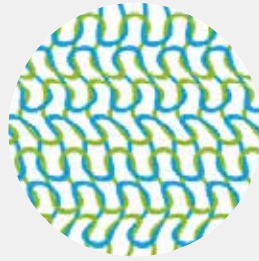
Franke Wire Race Bearings and linear systems are available worldwide. Offices and partners in many different countries advise our customers and are on hand to help you with our products and services. Our cooperation with strong partners in North America and Asia enables high level customer consulting as well as fast and competent on-site-service.

The Influence of Bearings on Fabric Quality

The bearing that rotates the dial, cylinders and fabric take-down has the biggest influence on the needle guidance and therefore on the fabric that is produced. Perfect results are only achieved by accurate radial and axial guidance of the needles. The introduction of Franke bearings as component parts has become a pioneering development in the design of high-performance circular knitting machines.

The typical feature of Franke wire race bearings are their special tempered race rings with ground or drawn raceways on which the balls run. The race rings are inserted directly into the mating structure. The compact overall dimensions offer new possibilities to the design of your machine, unlike any other bearing solution available.

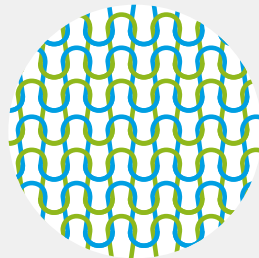
Franke wire race bearings have proved successful in the field of circular knitting machines for more than 50 years. The world-class manufacturers of circular knitting machines rely on Franke Wire Race Bearings.



Ground wire race rings

Steel balls

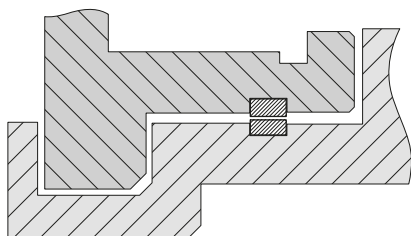
Ball cage



There are many simple solutions of building something like a bearing. The only question is: will your customer be satisfied with the machine performance and the fabric quality he gets from your machine?

Hard Material

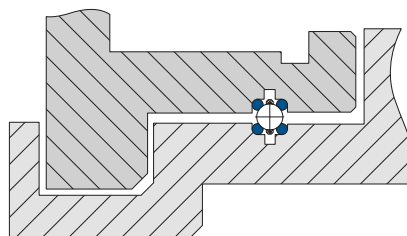
- cheap
- no guidance and no precision
- jerky start and stop-motion
- high energy consumption



Franke wire race bearings are the right solution for perfect fabric quality. Even only in the version of an axial bearing, the performance of your machine will improve enormously.

Franke Wire Race Bearing as axial bearing

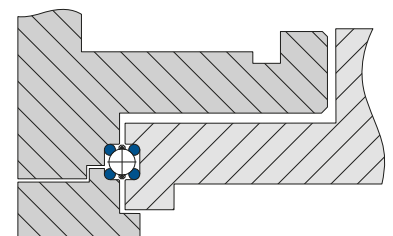
- easy to mount
- low energy consumption
- jerk-free motion
- long lifetime



Franke wire race bearings as 4-contact-ball-bearings with ground raceways are the ultimate solution for perfect rotation of the knitting cylinders and best fabric quality.

Franke Wire Race Bearing as 4-point-contact bearing

- easy to mount
- perfect running behaviour and precision for excellent fabric quality
- preload adjustable and re-adjustable
- minimum energy consumption
- long lifetime



Franke Wire Race Bearings: compact, highly durable, customizable

The Franke principle delivers maximum design freedom. In our wire race bearings, the rolling process does not take place directly between the rolling element and the mating structure, and instead with low friction on the race rings. You receive maximum design freedom thanks to their compact and highly durable 4-point contact. You are at liberty to choose whichever material, geometry, size, bore pattern, gear and sealing you require.



High Precision

Franke wire race bearings get their high accuracy from the special grinding process of the raceways. This patented Franke principle has been improved over decades. Today Franke Wire Race Bearings are found in sophisticated applications with highest requirements and in every branch.



Long Lifetime

Due to the 4-point-contact design which enables the bearing to take equal loads from all directions, Franke wire race bearings are perfectly suited to carry loads for a long lifetime. Tempered steel and the Franke high precision grinding technology guarantee a long lifetime of the bearing parts.



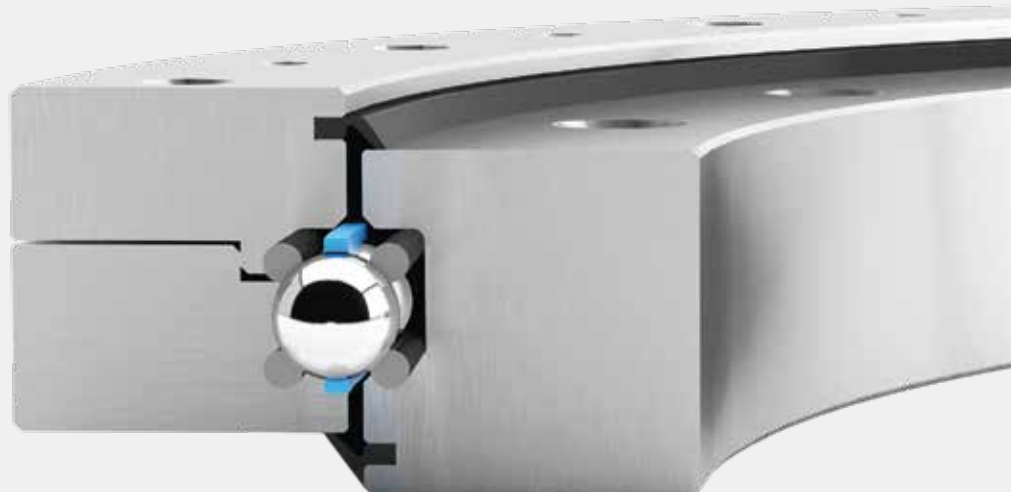
Cost Effective

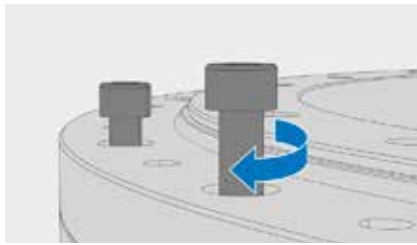
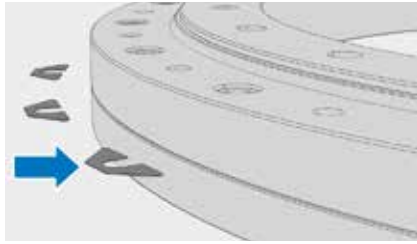
Franke wire race bearings are running for long periods maintenance-free, thus saving time and money for repair. The vibrationless operation of Franke wire race bearings saves the lifetime of all parts involved. The machines are running longer, faster, more silently and without mechanical break-downs.



Effective Energy Saving

The low friction and high precision running of Franke wire race bearings reduces the drive energy up to 30% compared to other solutions. Therefore much smaller motorization is necessary and energy can be saved.

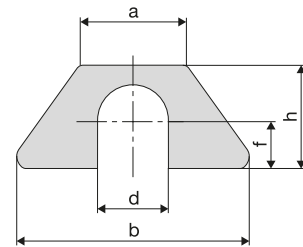




Mounting of Bearings

Select the block of washers. The thickness of the block should not be less than 0.1 mm of the calculated average value.

Washers are selectable in thickness of 0.025 mm up to 1.0 mm.



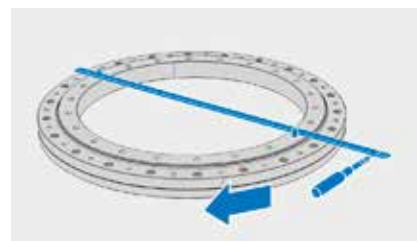
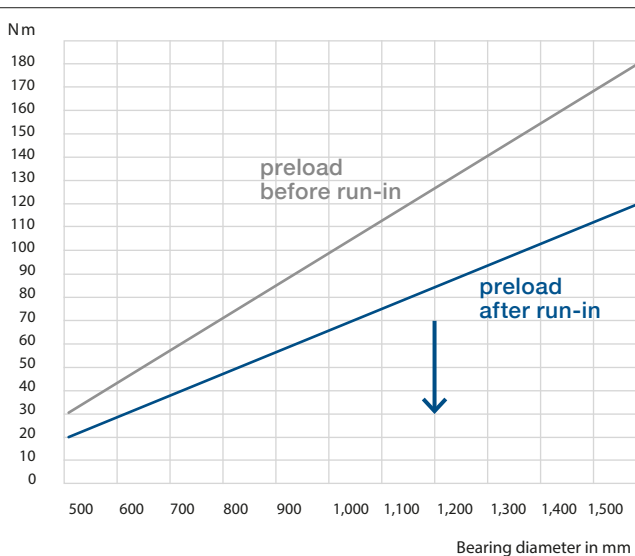
Sizes	Dimensions mm				
	a	b	d	f	h
M 6	11.0	24.4	7	5	11.0
M 8	14.7	34.2	9	6	13.5
M 10	16.4	42.3	11	7	16.0
M 12	20.3	46.0	13	8	18.0
M 16	25.4	54.0	17	11	24.0

Distribute the washers between all the check and fastening screws of the separated mating structure.

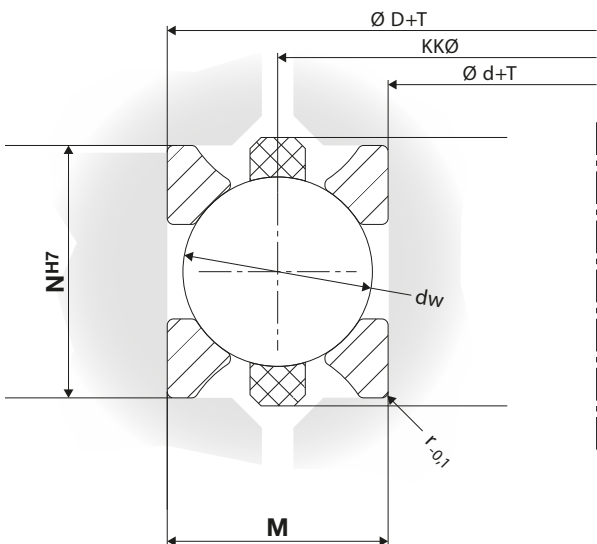
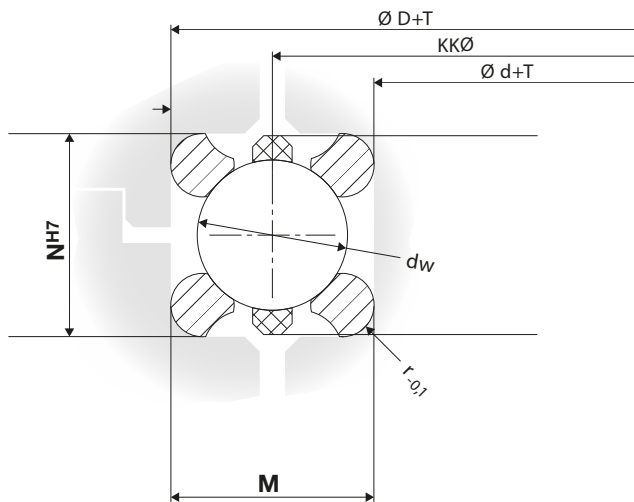
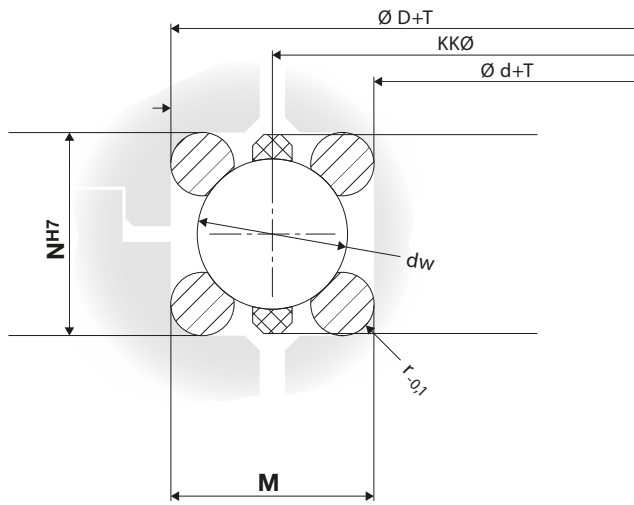
Preload Adjustment

Install a lever arm of 1m from center of bearing
Use a tension spring balance to measure the preload (torque resistance) e.g. 100 Nm for KK 1.000 mm.

After run-in-process (few hours) the preload reduces by 30% to around 70Nm and keeps stable.



Most popular Bearings for your Application



LEL4

Most commonly used.
Ground race ways for highest running culture.

$d_w \varnothing$	$\varnothing KK$	Wire \varnothing	$M \times N$	r
8.000	150 – 1,000	4	12.00	1.9
9.525	150 – 1,200	4	12.95	1.9
12.000	300 – 1,500	4	14.61	1.9

LED4

Predefined double profile.
Drawn or ground race ways.

$d_w \varnothing$	$\varnothing KK$	Wire \varnothing	$M \times N$	r	Raceway surface
8.000	150 – 1,000	4	11.78	1.9	ground
9.525	150 – 1,200	4	12.95	1.9	unground
12.000	300 – 1,500	4	14.61	1.9	ground

LER3/LER4

Drawn race ways.
Easy to integrate.

	$d_w \varnothing$	$\varnothing KK$	Wire \varnothing	$M \times N$	$r_{max.}$
LER3	9.525	100 – 1,500	4 x 3	11 x 13	0.3
LER4	12.000	200 – 1,800	5 x 4	14 x 16	0.3

$KK\varnothing \leq 250 \text{ mm } T = IT7$
 $KK\varnothing > 250 \text{ mm } T = IT6$

All dimensions in mm



www.franke-gmbh.com



[Watch the Video > Function principle of Franke Wire Race Bearings](#)

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