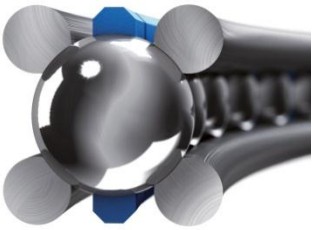
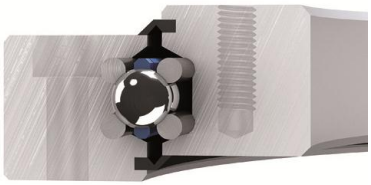
Why Wire-Race Bearings?

About the key-benefits of Franke bearings

1. We like to talk about the construction related light-weight design of Franke wire race bearings. What does this mean in particular?

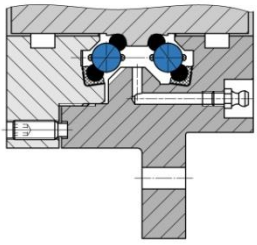




The functionality of all Franke products is based on the “Franke principle”: rolling elements roll onto special wire races which are placed in enclosing constructions. Thanks to the four-point arrangement, these wire races can accept loads from all directions. The Franke wire-race bearing enables an individual design of the enclosing construction, as well as a free choice of material. That is why it is possible to manufacture the housing components of the bearing in an extremely thin-walled manner and tailored to the adjacent construction.

Alternative materials such as aluminium or even plastic are also suitable for the manufacturing of the enclosing construction and save weight or drive energy.

2. Durability in case of critical uses is another criterion for the bearing technology. How do wire-race bearings face this challenge?

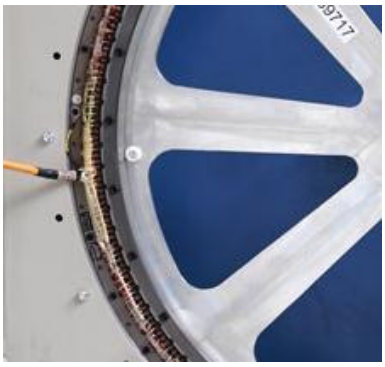


We consider critical applications those applications for which the wire-race bearing technology has an advantage and the conventional bearings encounter their limits. Here two examples of this:

Franke wire-race bearing in computer tomographs:
Speeds up to 300 rpm, noise level <60 dB(A) and rotational resistance of <15Nm for a bearing diameter of 1000 mm are key specifications which can only be reached with highly specialised roller bearings. Here, Franke wire-race bearings stand up with their constructive flexibility that allows inserting double-row angular ball bearings adapted to the customer’s construction which are additionally damped by elastomers. That cannot be achieved with conventional bearings.

Franke wire-race bearing in the automotive technology:
Lightweight construction, smaller mounting space, temperature insensibility, interior elasticity to compensate the vehicle torsions, lower rotational resistance – meaningful characteristics in the area of vehicle construction/aeronautics. Franke rotary joints made of aluminum are the first choice for these requirements. The areas of application are rotating satellite dishes on vehicle roofs, wheel bearings with direct drive, highly precise laser measuring devices at aircraft fuselages, movable external cameras at helicopters and much more.

3. Which trends can we encounter currently for bearings?



The integration of the bearing function in the enclosed constructions is progressing further. Lightweight construction and smaller dimensions, for example for service robots, further this trend. Intelligent bearing solutions with drives and control elements will increase – in this case, we are involved in interesting projects with integrated torque motors.

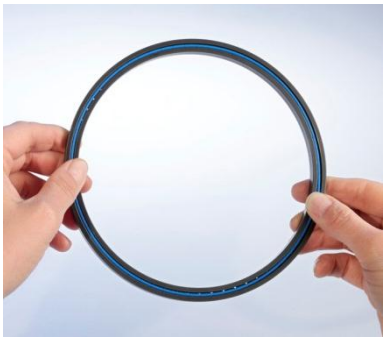
In the service area, the customers set a high value on the durability and freedom from maintenance of the roller bearings. Up to now, we could reach yet runtimes of 100 million revolutions in endurance tests without carrying out a re-lubrication.

4. Franke participates in the racing with a wire-race bearing. What is the reason of this Engagement?

The wire-race bearing enables the off-centre suspension of the wheels for a prototype of a new generation of racing cars. The wire-race bearing was integrated directly in the filigree rims construction and its smallest mounting space, high load capacity and light and free running clearance are impressive features. The wheel carrier was developed by students of the Hochschule Amberg-Weiden in the Running Snail Racing Team.

The racing has always been a “bearer of technology” and an experimental field for innovative solutions. Innovation is an important part of our brand core and in this case, we were happily prepared for supporting the project of the Hochschule Amberg-Weiden and the Running-Snail-Team. As we test the limits of the wire-race bearing consciously, not only do we learn from them, but we can also deduct important findings for conventional applications from the tests.

5. Franke has developed a particularly compact bearing element which is suitable for the smallest mounting spaces: the LEG. What is so special about it?



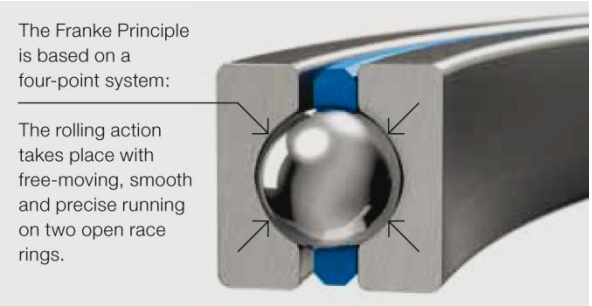
The LEG 8 is a completely new development. We have succeeded in designing the dimensions of a wire-race bearing in such a way that it can be applied as fully adequate thin-section bearing (slim bearing). And that with all advantages that the Franke wire-race bearing offers. Another advantage of our product is its attractive price, which for some diameters, is 50 percent lower than the thin-section bearings of our competitors.

Like all Franke products, the LEG 8 can also be used flexibly. The bearing is designed to be used in packing machines, winding machines of the textile industry, for robot handling and in the medical technology.

6. And what is about the four-point system which Franke applies consistently?

In terms of design, the LEG 8 is similar to the thin-section bearing of other manufacturer, but it withstands higher loads thanks to the reliable four-point principle of Franke. The two bearing races have a gothic profile. That means that the rolling elements are in

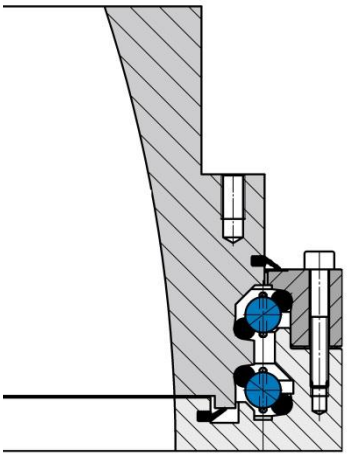
contact with the bearing races at two points each. That is how we put into practice the 4-point principle with only two wire races. The four-point principle ensures a support of the bearing in all directions. This makes it able to support high loads, both radial and axial. Thus, it forms a universal product for a wide range of applications.



The four-point bearings are not a particular invention by Franke. This is a common principle in the area of bearing construction. However, the Franke wire-race bearings extend it by offering individual arrangements and grind sections of the wire races, as well as dimensioning of the rolling elements, in order to respond individually to the particular load situations of the application.

7. With which other construction principles do you have to compete in the Benchmark?

That depends very much on the case of application. Our aim is to find applications which are “franke-like”. That means, cases of application for which we can show our strengths, such as customer-specific design, smaller mounting space, large centre clearance and low weight. Once the customer is aware of the possibilities and advantages of the wire-race bearing, he will hardly find comparable alternatives.



In case of conventional applications, we compete against all traditional bearing solutions from the standard rotary joints to the thin-section bearings. Here it is difficult to persist against the largest suppliers. However, if the customer wants constructive particularities which differ from the standard versions or wants to economize components, the Franke wire-race bearings are an interesting alternative.

8. For which applications do we consider wire-race bearings especially suitable?

The range of applications of Franke products is very versatile. We develop tailor-made customer solution for different sector and in doing so we adjust ourselves entirely to the individual application.

In order to find an application in the products of tomorrow, the bearings must have high quality material properties. Franke GmbH implements coating techniques from the state-of-the-art research, adjusted to the needs. This includes special chemical and physical coating processes of the bearing race and the adjacent construction, to achieve the desired properties. Franke bearings are especially suitable for demanding areas, such as clean room, vacuum, aeronautics, food and medical technology, as well as solar engineering. The application of modern lubricants represents a further adjustment step to the respective application. Franke bearings can be operated individually with food-grade, clean room and vacuum compatible lubricants, low temperature grease, chemical resistant or special lubricants for underwater applications.