

Franke Whitepaper

November 2023



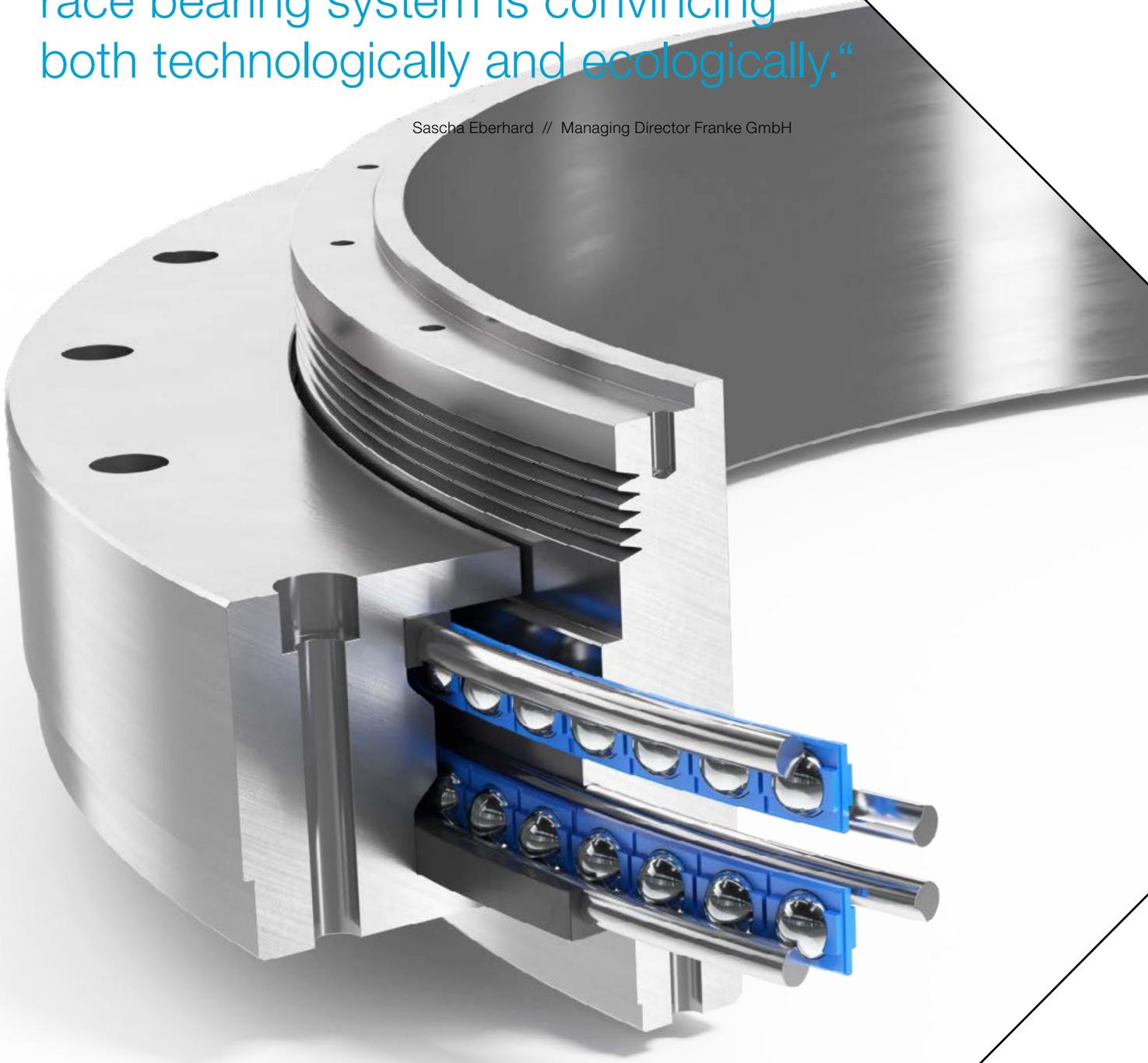
Refurbishing

Sustainable and cost-saving use of bearings.

Technology | **Service offers** | **Best Practice**

„The principle of the Franke wire race bearing system is convincing both technologically and ecologically.“

Sascha Eberhard // Managing Director Franke GmbH



Whitepaper

Refurbishing - Sustainable and cost-saving use of bearings.

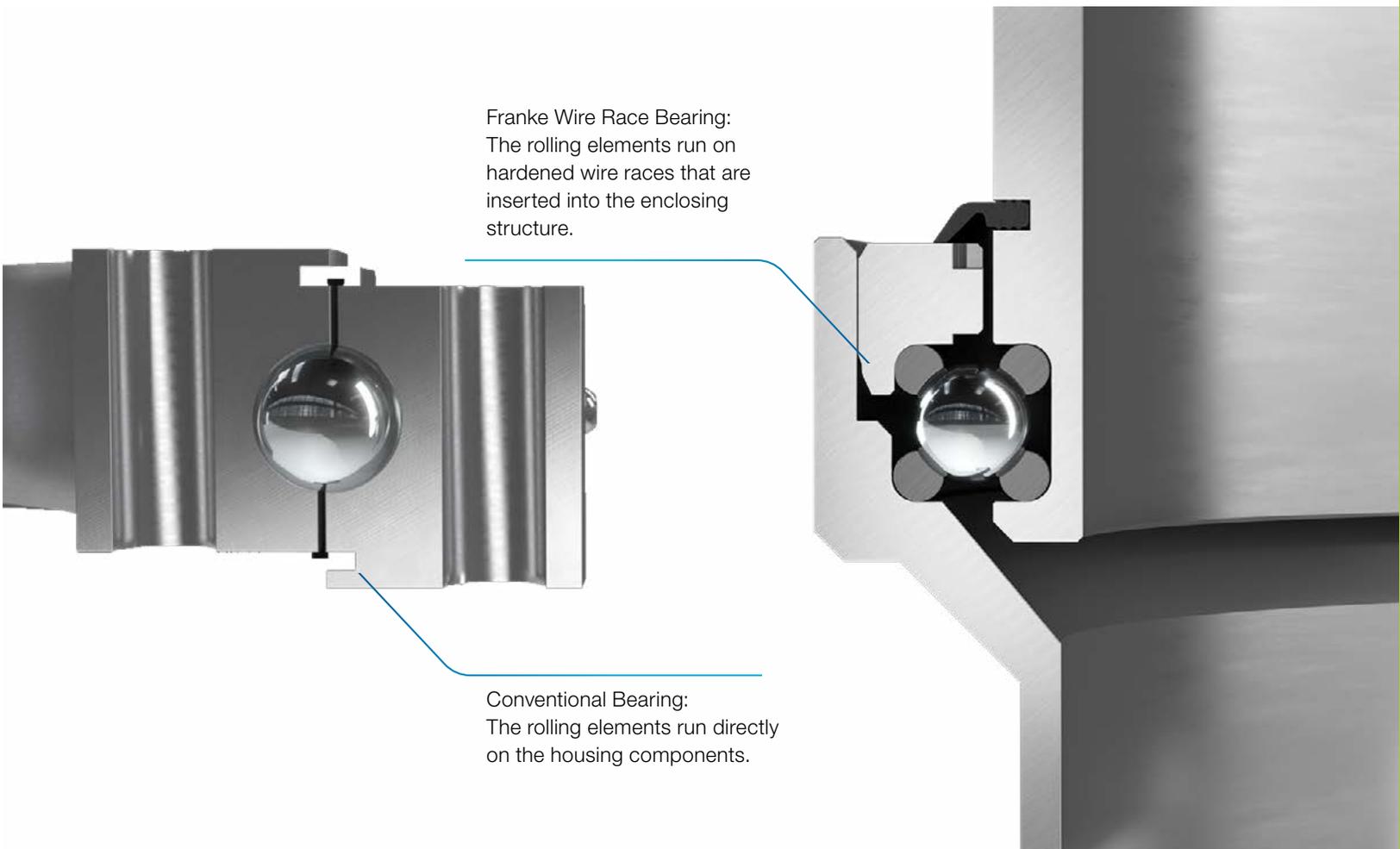
Abstract

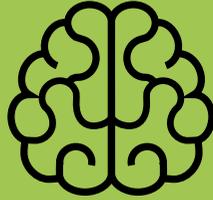
Sustainability and resource conservation are also important issues in mechanical engineering. In many cases, repairing machines and components instead of scrapping them is the better approach to maintaining or even increasing the efficiency and profitability of a production plant. Franke Wire Race Bearings support you in this.

Content

| | |
|--|-----------|
| 1. Introduction | 4 |
| 2. Basics of Wire Race Bearings | 4 |
| 2.1 Design principle | 5 |
| 2.2 Super individual customization | 6 |
| 3. Refurbishing of Wire Race Bearings | 8 |
| 3.1 Components | 9 |
| 3.2 Ecological and economic advantages | 10 |
| 3.3 Preventive maintenance | 13 |
| 4. Refurbishing as a Service | 14 |
| 4.1 Procedure | 15 |
| 4.2 Duration | 16 |
| 4.3 Costs | 17 |
| 4.4 Form | 18 |
| 5. Conclusion | 19 |
| Further links | 20 |

Franke Wire Race Bearing - Comparison of principles





1. Introduction

In his search for a space-saving bearing for an optical device, engineer Erich Franke developed the wire race bearing in 1936. He described his invention as „a ball bearing with a particularly small space requirement, with which the highest demands on the accuracy of the movement of one body on another can be met without difficulty.“

For over 70 years, Franke has continued to impress its customers with innovative, highly customized solutions in the areas of bearings and linear guides. They are all based on the same principle invented by Erich Franke in 1936.

2. Basics of Wire Race Bearings

2.1 Construction principle

The key difference between a conventional ball bearing and a Franke wire race bearing lies in the races. In a wire race bearing, the rolling elements do not roll on solid housing rings, but on delicate wires. The flexibility of the Franke principle makes it possible to design more freely and simply in order to develop better products.

In a wire race bearing, heavy-duty wire raceways take over the bearing function. This saves weight and space. The free choice of material and the free design of the enclosing construction can also greatly reduce the weight of the overall product.

Super individual

Individualization through the Franke modular system

All you need for your product solution with Franke bearings is a wire race bearing. Franke bearing elements offer highly customized solutions and can be integrated directly into your design. Wire race bearings can be customized to your requirements in terms of shape and material. You can find examples here:

Rolling element



Raceway geometry



Cages

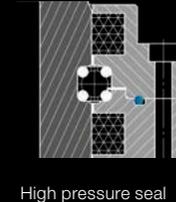
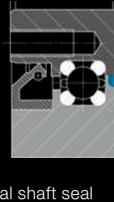
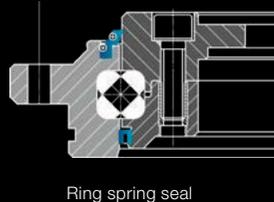
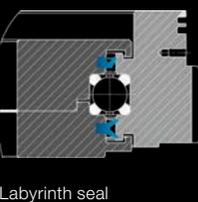


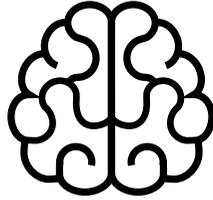
Spezialausführungen

Types of gearing



Types of seals





2.2 Super individual customization

You can purchase only the bearing elements from Franke or ready-to-install bearing assemblies. On request in a customized design, with gearing or with an integrated torque motor.



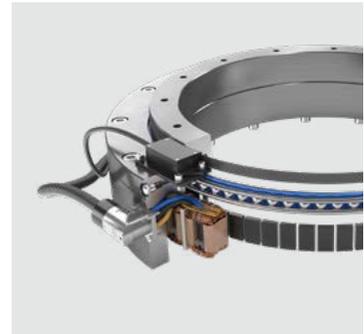
Bearing Elements & Slim Bearings

All you need for your product solution with wire race bearings is a Franke bearing element. Franke bearing elements can be integrated directly into your design. You can easily install them yourself. The shape and material of the bearing element can be customized to your requirements, for example by choosing non-magnetic ceramic rolling elements.



Bearing Assemblies

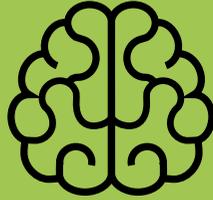
If required, we can also design and manufacture complete bearing assemblies for you. These are even easier to install than bearing elements. Franke bearing assemblies are available in any size, with individual bores and teeth and in numerous materials such as aluminum, stainless steel, carbon or as a 3D-printed housing.



Rotary Tables & Direct Drive

Would you prefer a complete solution from a single source? Franke offers complete customized positioning and drive units, optionally with proximity switch, clutch and motor. Direct drive systems are a particular strength of Franke. They are used, for example, in many computer tomographs from renowned manufacturers.





3. Refurbishing of Wire Race Bearings

3.1 Components

Bearing Assemblies with integrated wire race bearings have a long service life. But even if the wire race bearing has reached the end of its service life, the elaborately manufactured housing parts can still be used. They are not directly exposed to the stresses of the bearing and are therefore often still in good condition.

It is often sufficient to replace individual components such as

- Races,
- Rolling elements und
- Cages,

to make the bearing fully functional again. This saves time and money and makes a valuable contribution to conserving resources and protecting the environment.

3.2 Economic and ecological advantages

Repair instead of replace



Maintenance can extend the service life of machines and systems. As a result, investments are amortized more quickly with a longer service life.

The disposal of old machines and components can also be problematic and contribute to pollution and environmental impact. Refurbishing reduces the amount of waste, which helps to avoid waste and saves disposal costs.

By using refurbishing for machines, a company can not only improve its own carbon footprint, but also benefit from long-term cost savings and a positive image, as sustainability is becoming increasingly important for many customers and investors.

Sustainable, quality-assured, competent



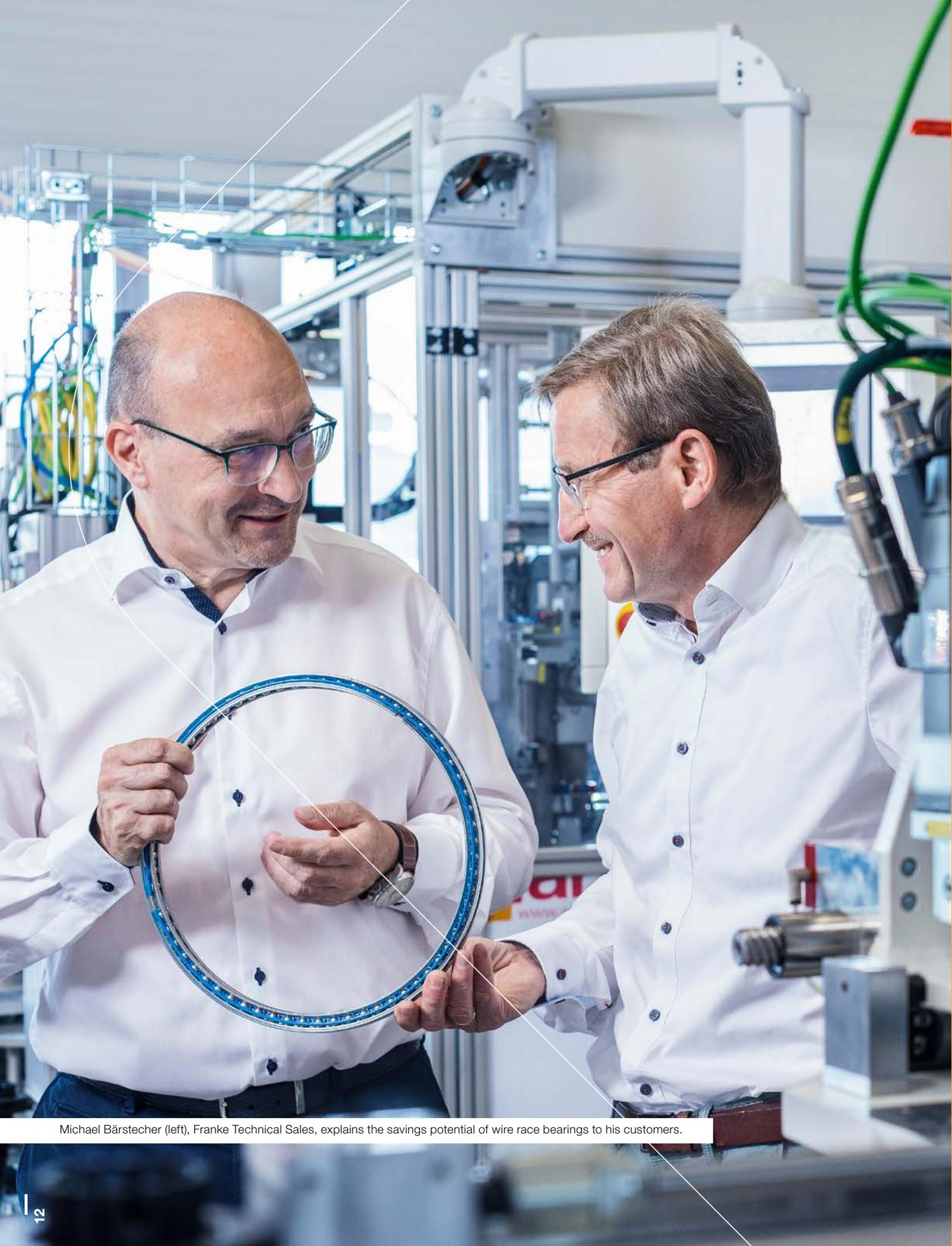
Certified procedures and processes guarantee maximum quality assurance and reliability at all times. This applies equally to new products and repairs. As a development partner, Franke engineers and consultants are happy to provide information on the options available in individual cases for the cost-effective repair of wire race bearings.

Especially in this day and age of cost-saving and sustainable goods production, the idea of repairing tried and tested products instead of buying new ones is becoming increasingly important. Wire race bearings from Franke are ideal components for this.

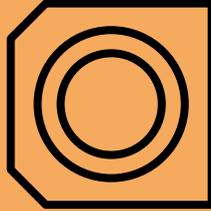


| Technische Zeichnung | |
|----------------------|---------|
| Bezeichnung | Maßstab |
| | |
| | |
| | |
| | |





Michael Bärstecher (left), Franke Technical Sales, explains the savings potential of wire race bearings to his customers.



3.3 Preventive maintenance

Preventive maintenance of machines and systems is crucial in order to avoid expensive downtime and costly repairs. An effective method of optimizing these maintenance processes is the use of wire race bearings.

In the context of preventive maintenance, wire race bearings offer several advantages.

Firstly, they help to reduce wear and friction, which can significantly extend the service life of machines and systems. This leads to fewer breakdowns and lower repair costs. Secondly, wire race bearings enable more accurate monitoring of the condition of machinery, as they can indicate wear and problems at an early stage. This makes it possible to plan maintenance work before serious damage occurs.

Integrating wire race bearings into a company's maintenance program can help improve efficiency, increase productivity and reduce total cost of ownership. By replacing bearings in a timely manner and continuously monitoring equipment, companies can minimize unplanned downtime and improve the reliability of their production.

Overall, wire race bearings are a valuable component in preventive maintenance that can help to ensure the smooth operation of machines and systems and increase the long-term profitability of production processes.

4. Refurbishing as a Service

Practical example:

A Franke bearing assembly with a ball and cage assembly diameter of 800 mm is used in a customized design in a machine for glass processing. The bearing assembly is exposed to environmental influences such as glass dust and high-pressure cleaning agents. Despite special sealing of the housing parts, wear of the bearing element cannot be avoided. Replacing the races and rolling elements would repair the bearing.

4.1 Procedure

4.1.1 Inventory

The bearing assembly is delivered by the customer in an assembled state and measured on the test bench at Franke's premises to determine the actual condition. The bearing is dismantled in order to examine the condition of the bearing element and the wire bed.

4.1.2 Findings

The wire bed of all enclosing housing parts is slightly worn, but does not need to be reworked. The races of the bearing element show slight impressions of the rolling elements. Result of the findings: The bearing assembly can be completely repaired by replacing the bearing element.

4.1.3 Feedback to the customer

The customer receives the findings report together with a quotation. In discussions with the customer, an additional lubrication hole is requested to simplify maintenance of the bearing. This additional revision is carried out together with the repair.

4.1.4 Maintenance

The appropriate bearing element is manufactured, the lubrication hole is drilled in the housing and the fully assembled bearing is sent to the customer. The date of retreading is stamped into the outer ring of the bearing beforehand so that it can be assigned at a later date.

4.1.5 Customer feedback

The customer installs the bearing and puts it into operation. In no time at all, he has a bearing assembly that is as good as new, saving costs and valuable resources.



”

The reconditioning of wire race bearings gives our customers the opportunity to save time, costs and resources in one fell swoop.

Niklas Schwarzer
Franke Customer Service



4.2 Duration

50% Time saving



Compared to the production of a bearing assembly, the time required for refurbishing is only a fraction of the machining time. Depending on the complexity and material used for the housing parts, the time saved by refurbishing may even increase.

The special geometric characteristics of all wire race bearings ever manufactured are stored in the Franke archives. For many years in digital databases, previously in handwritten documentation. The technical specifications even of bearing assemblies from the late 80s of the last century can be used to replace the wire race bearing to be renewed 1:1. Care is also taken to ensure that the original specifications of the finished bearing are adhered to in terms of rotational resistance and accuracy.

4.3 Costs

60% Cost saving



Even with standard bearing assemblies, replacing the wire race bearing can save up to 60% in costs compared to purchasing a new complete bearing.

Such retreads quickly pay for themselves, particularly in the case of complex housing parts with complicated geometries or made of exclusive materials such as stainless steel.



4.4 Form

Would you like to have a Franke wire race bearing reconditioned?
It's easy with the return delivery form. It contains all the information you need to formulate your request and to start the diagnostic process at Franke quickly and efficiently. You can find it on our website: <https://www.franke-gmbh.com/downloads/certificates-and-guidelines>


Franke

Rücklieferungsformular
Return Material Authorization

Empfänger / Receiver
Franke GmbH
Wareneingang
Obere Bahnstraße 64
73431 Aalen

| Absender / sender | |
|---------------------------------|--|
| Firma / company | |
| Ansprechperson / contact person | |
| E-Mail / e-mail | |
| Telefonnummer / phone number | |
| Datum / date | |

Rücksendegrund / Reason for return

Reparatur / repair Austausch / Exchange Instandsetzung / refurbished

Fehlerbeschreibung / Error description
Folgender Fehler wurde festgestellt:

Artikelangaben / article details

| | |
|---|--|
| Lieferscheinnummer / delivery note number | |
| Auftragsnummer / order number | |
| Artikelnummer / part number | |
| Ihre Artikelnummer / your part number | |
| Stückzahl / quantity | |
| Seriennummer / serial number | |

Zustand der Ware / condition of the goods

Originalverpackung / original packaging Geöffnet / opened Verbaut / installed Lagerbestand / stock

Nach dem Erhalt der Ware erhalten Sie unsere Stellungnahme innerhalb von 6 Arbeitstagen.
After the arrival of the parts you get our feedback within 6 work days.

Rücklieferungsformular Stand: Februar 2023
Return delivery form Status: February 2023

5. Conclusion

The retreading of Franke Wire Race Bearings offers a number of clear benefits that impact the efficiency, longevity and cost-effectiveness of industrial equipment. Here are some conclusions on the benefits of this practice:

Cost savings: The retreading of Franke Wire Race Bearings enables companies to achieve significant cost savings as they can reuse existing bearings instead of buying new ones. This significantly reduces acquisition costs.

Extending the service life: By overhauling bearings, companies can extend the service life of their machines and systems. This helps to minimize expensive downtimes and production losses.

Sustainability: The reuse of bearings is ecologically sustainable as it reduces the need for new raw materials and the disposal of old bearings. This is an important step towards more environmentally friendly production.

Quality improvement: Franke wire race bearings are thoroughly checked and repaired during retreading. This improves the quality and performance of the bearings, resulting in more reliable operation.

Adaptation to new requirements: By overhauling bearing assemblies, they can be adapted to new operational requirements or technologies. This enables companies to keep pace with constantly changing conditions.

Expert knowledge: Franke has extensive experience and expertise in bearing refurbishment, ensuring that refurbished bearings meet the highest quality standards.

Overall, retreading Franke Wire Race Bearings offers an economically sensible way to extend bearing life, increase operational efficiency and at the same time have a positive impact on the environment. This makes it a worthwhile investment for companies in various industries.



Visit our website for more information in picture & sound



[About us](#)

See what moves us. Accompany the people of Franke in their daily activities.



[Sustainability at Franke](#)

All about our activities relating to economy, ecology and commitment.



[Sustainable Race Bearings](#)

The explanatory video on this topic shows you why Franke Wire Race Bearings are so well suited for retreading.



Contact Franke Service:

Niklas Schwarzer
Tel. +49 7361 920-205
n.schwarzer@franke-gmbh.de



Publisher:
Franke GmbH
Obere Bahnstraße 64
73431 Aalen

Contact:
Tel. +49 7361 920-0
info@franke-gmbh.de
www.franke-gmbh.de

Responsible:
Gerhard Reiningger
Public Relations
Franke GmbH

Photo credits:
Canva, Getty Images,
Adobe, Shutterstock, Fotolia,
Kronen, Trumpf, Franke

