



MAGAZINE

AGRICULTURAL TECHNOLOGY



Compact disc harrows - Page 04



Page 12

Cleaning machines: Sweeping, swivelling and turning



Page 24

Irrigation technology: Reliability is key!



Page 38

Spherical plain bearings in mobile work machines

Contents



04 Compact disc harrows: Tough conditions, reliable performance



12 Cleaning machines: Sweeping, swivelling and turning

20 What is important in bearings



24 Irrigation technology: Reliability is key!



32 HIGH-TECH for laying hens



38 Spherical plain bearings in mobile work machines



Veit Loeffler,
Managing director of the LFD Group

Technical exchange and good customer feedback

The LFD Group is a family business that has been operating worldwide since 1978. The values of our enterprise are respect, trust and fairness.

The economic success of the company is tightly linked with our active perception of our corporate, social and ecological responsibility.

Our customers grant us an in-depth view in their own production. As a result, this leads to an intensive exchange of requirements, but also the extremely positive feedback that we receive on-site. For us, this is our key motivation!

We invest extensively in our quality in order to adapt to the market needs and to be able to develop continuously. Each quality and process step is documented and traceable.

We can perform extensive analyses in our laboratory, facilitating us to utilise the knowledge gained in the further development of our products. Subsequently, these are verified individually on our endurance test benches. Likewise, benchmarks are performed on competing products.

For many years, we have actively pursued environmental protection and the conservation of resources in all areas. In 2016, our company will be certified according to the latest version of ISO 14001:2015.

Due to our customers being located worldwide, we are represented on all continents. In addition to the central warehouse in Germany, the LFD Group also has further storage capacity in France, Italy, the USA, Chile, Russia and Shanghai.

Additional representative offices facilitate quick response times, ensuring that LFD customers can be offered the fastest possible delivery.

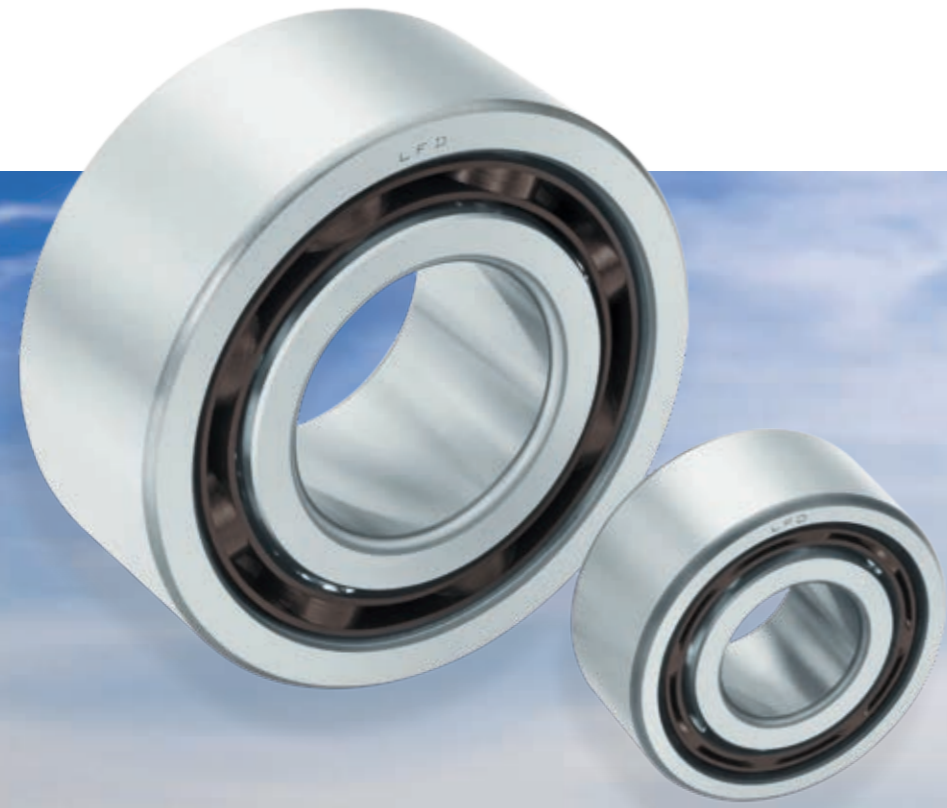
Our first office in Africa was established in 2016, in the city of Zvishavane in Zimbabwe. The LFD spherical plain bearing technology with spherical plain bearings, rod ends and standardised fastening components complete our range of products.

Veit Loeffler
Managing director of the LFD Group



LFD HEADQUARTERS Germany
Giselherstraße 9 - D 44319 DORTMUND
Phone +49 231 977 250 - Fax +49 231 977 252 50
Email info@LFD.eu - Internet www.LFD.eu

Image credit, title and table of contents:
SELL MEDIA COMPANY - Norbert Sell, BEINLICH-Beregnung.de,
WESTERMANN-radialbesen.de und AMAZONE.de
Image credit back cover Traktor auf Feld © Vevchic Imagelia.com,
SELL MEDIA COMPANY - Norbert Sell,



Compact disc harrows: **Tough conditions, reliable performance**



Foreign matter and exposure to dirt are the key issues in regard to the compact disc harrows. How do the bearings of the harrow hollow discs hold up to the challenging conditions encountered on the field? In the AMAZONE compact disc harrows, the LFD antifriction bearings run fully encapsulated and protected in housings and as a result can provide their full capacity for many years.

High marks on the field



The angular ball bearings of the harrow discs, which prepare the soil on the AMAZONE compact disc harrows, are protected by sealed housings at the manufacturer BBG Leipzig. Each of the two-row angular ball bearings runs in its own housing. The disc itself simultaneously serves as the cover for the housing.

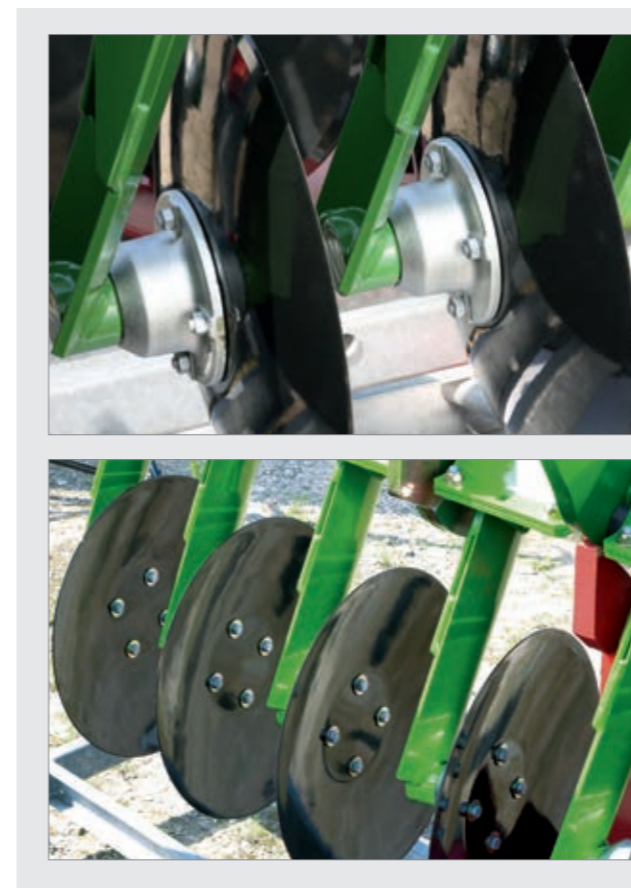
Dirt, dust, and moisture are kept outside, while the open angular ball bearing separated by the steel can deploy its excellent capability in the protected surrounding.



Catros 6001-2 with wedge ring roller
Image: © AMAZONE.de



Images: © SELL MEDIA COMPANY - Norbert Sell - Catros 4001-2TX with double U profile roller



As a result, the work on the field is performed absolutely reliably. The hollow discs are arranged in two rows positioned behind each other. The cutting angle is predefined, while the offset between the disc rows can be adjusted. The hollow discs are spring-loaded with elastic rubber and just like the trailing wedge ring roller operate maintenance-free with LFD bearings.



PROVIDING PRECISION



Reliability tested on the field

The AMAZONE company regularly has its compact disc harrows tested for reliability and operational efficiency. The German Agricultural Society (DLG) tested the AMAZONE Catros-TS for its market launch with a trailed, separate chassis and determined excellent performance values. In addition to the work quality, the testers of the agricultural magazine "DLZ Agrarmagazin" in particular praised the low drag resistance.

The bearings intended for the use in the compact disc harrows were also run on the test benches of BBG Bodenbearbeitungsgeräte Leipzig GmbH & Co. KG in endurance testing. Here, LFD proves its operating performance on a level that can be considered as the top reference value for quality.



Image: Catros +5001-2: © AMAZONE.de - Image: Single harrow disc: © SELL MEDIA COMPANY - Norbert Sell



Balanced play of the forces

Each operation is a great feat of strength for the technology. With greater working depth and increasing velocity, the inertia, tensile and compressive forces rise, which the bearings of the hollow discs must absorb and distribute.

With the Catros+, a working depth of up to 15 cm can be achieved. Additionally, a ballasting is possible, in order to safely achieve the set working depth. A large force is applied on the rough arable soil with a great deal of precision. The Certos achieves a working depth of up to 20 cm.



The result of a good idea

Images: © SELL MEDIA COMPANY - Norbert Sell - Certos discs with large bearings



Image: © AMAZONE.de: Catros +6001-2 TS

Excellent test results throughout

Both the specialist magazine "Agrar" as well as the DLG performed tests on the AMAZONE compact disc harrows. Their proverbial reliability is due to the sound workmanship and high-grade technology. BBG Leipzig attests performance values to LFD Wälzlager GmbH in accordance with the in-house operating testing for the utilised angular ball bearings – also for long-term operation under hard work usage.

Those that rely on the annual yield of their fields are familiar with the extent of the work that is required until the barns and silos can be closed in autumn. Technology is required that is reliable down to the last detail, enabling a rich harvest at the end of the season. Bearings manufactured by the LFD Group are produced with the greatest precision for the reliable operation of these machines.



Cleaning machines: Sweeping, swivelling and turning



Sweepers by WESTERMANN provide clean surfaces. Feed treatment augers aerate and prepare sticky feed in such a manner that it becomes tasty again for cattle. To ensure that everything runs smoothly, WESTERMANN installs LFD bearings in its machines.

You cannot make an omelette without breaking some eggs – and where you till the land, you will create dirt. The WESTERMANN company from Meppen offers both self-propelled sweepers as well as those trailed by tractors. WESTERMANN sweepers clean very dirty

floors – floors that following the harvest or other trips to the field clearly show the signs that heavy machinery has been operated in clayey fields or floors in stables that have become soiled with cow dung – an easy task for WESTERMANN sweepers.

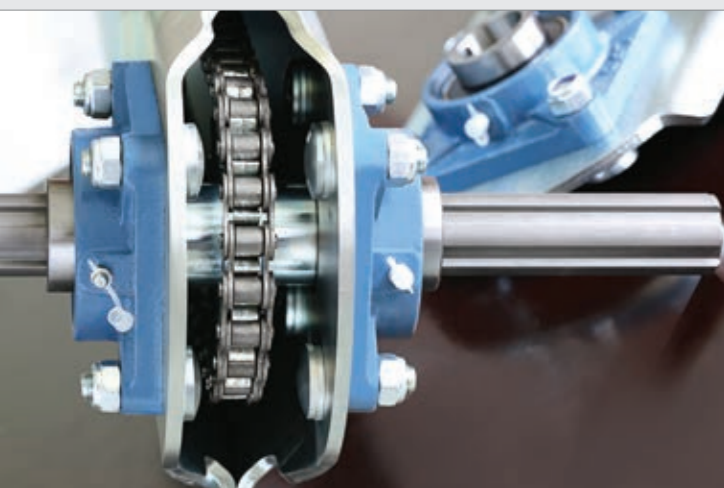


Image: © SELL MEDIA COMPANY - Norbert Sell - Images bar cleaning machines: © WESTERMANN-radialbesen.de



Image: © WESTERMANN-radialbesen.de

The mounted sweepers by WESTERMANN are all-rounders for agricultural applications. When traces of clay, farmland and harvest firmly adhere to roads and streets, they are in their element. When it is time for the "spring cleaning" of farmyards and stables, these machines are at the ready with full power.

precision and service life for the requirements, which in part are very challenging. Additionally, the seals perform exactly in the manner demanded by this environment. The various bearings fulfil their tasks with distinction, although they are usually mounted to the machines visible from the outside without an additional protective housing, as is the case with most other applications.

The various housing bearings in which the axles and shafts run, must also deliver their full potential. WESTERMANN uses housing bearings, in particular pillow block bearings as well as cast flange plummer blocks. LFD flange bearings made of sheet steel are also used in the event of lighter machines. Experience has shown that these LFD components provide the necessary



Images: © SELL MEDIA COMPANY - Norbert Sell

Radial sweepers for challenging applications – with precise LFD bearings





Images: © SELL MEDIA COMPANY - Norbert Sell

Rejected feed becomes attractive again

Feed that has come into contact with the animal's saliva and is now sticky, will be accepted again by the cattle after mixing and aerating. Here, the LFD bearings used by WESTERMANN provide reliable service even though the sticky feed mass is heavy and inhomogeneous.

LFD bearings absorb the forces that occur at the shafts and ensure the secure operation with a long service life.



Image: © WESTERMANN-radialbesen.de



PROVIDING PRECISION



Machines from own production



Image: © WESTERMANN-radialbesen.de

Application diversity, a central benefit

WESTERMANN machines are operated in environments with a high occurrence of dust, dirt and moisture, both in summer as well as in winter with strongly varying temperatures. Even when the sweepers and feed preparation machines are in their element, the bearings will not become contaminated due to the precise LFD seals. The utilised flange bearings are constructed with a closed design with a precisely dosed amount of grease.

The inner components of the LFD bearings are protected against the ingress of contamination by means of special seals. Furthermore, the optimal amount of grease provides its contribution to this. This is of an invaluable advantage to the designers and mechanical engineers of WESTERMANN – and of course to the farmers that benefit from the high-performance and long-lasting support during sweeping, swivelling and turning.



Images: © SELL MEDIA COMPANY - Norbert Sell



Economical and ecological: Technology in a well-balanced ratio

LFD engineers energetically and intensively work on in-house, environmentally friendly products, in order to solve the tasks in the respective applications with distinction. We provide our customers from the agricultural sector with mature products and work on the further development and optimisation. The usage of in-house test benches at LFD enables us to achieve the ideal further development of our products in close cooperation with our customers.



Insert rolling bearing / insert rolling bearing units

Insert rolling bearing units are used very frequently in agriculture. An insert rolling bearing unit is comprised of a deep groove ball bearing with a spherical outer ring and a housing made of grey cast iron or formed sheet steel. In this manner, the LFD insert rolling be-

arings and the matching housings form a unit ready for installation: Housing bearings, pillow block bearings, flange bearings. The special aspect of the insert rolling bearing units is their capacity for compensating misalignments and shaft deflections.



The inner ring of an insert rolling bearing can have the width of the outer ring or depending on the specific application, the inner ring is extended on one or both sides. The attachment of the LFD insert rolling bearings on a shaft is performed with set screws or with an eccentric ring.

Due to the fact that heavy contamination with dirt is to be expected in agricultural usage, the LFD Group places a particular emphasis on application-optimised centrifugal discs, which provide additional protection against the ingress of foreign matter. The centrifugal discs are secured to the inner ring of the UC insert rolling bearing and are designed custom-fit with a minimum gap to the outer ring, ensuring that no additional friction occurs.

Insert rolling bearing units of the LFD Group have been used for many years in various industry sectors such as agriculture as well as in conveyor and drive technology. This includes all variants: Housing bearings in general and flange bearings and pillow block bearings specifically..

Selection of the lubricant is crucial

An optimal film of lubricant is essential for a long service life, which under prolonged use and continuous load prevents the metallic contact of the ball with the bearing track.

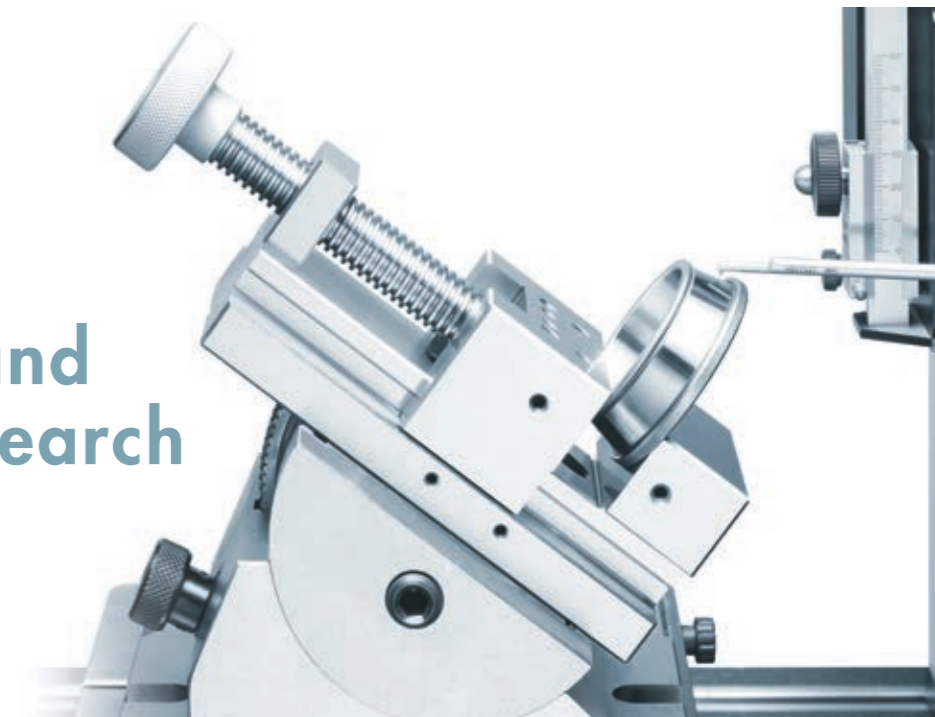
In addition to the correctly dosed amount of lubricant, which safeguards that all function surfaces are supplied with sufficient lubricant at all times, the selection of the lubricant is crucial for a long service life.

Just like the sealed standard deep groove ball bearings, the insert rolling bearings are filled with lithium soap grease, which under normal operating conditions is sufficient for the service life of the bearing. Because LFD bearings must achieve their service life under differing and harsh operating conditions that match the application, the use of special lubricants is unavoidable instead of the standard lubricant. For example, in certain usage cases it is necessary to use lubricants with solid lubricant additives, in order to withstand extreme pressure loads.





LFD products and agriculture research



An additional important characteristic during the grease selection is the temperature behaviour of the respective applications or the necessity of conducting heat away via the lubricant; however, this only applies in the event of oil-circulating lubrication.

For example, the LFD Group works with greases, which have been approved by the US DRUG ADMINISTRATION as an H2 lubricant for the officially monitored livestock breeding as well as on poultry farms. Therefore, in addition to the other factors, which play an important role during the selection of a bearing, the selection of the right lubricant is of particular importance. For this reason, the engineers of the LFD Group are happy to be of assistance during the application-related selection of the optimal lubricant.

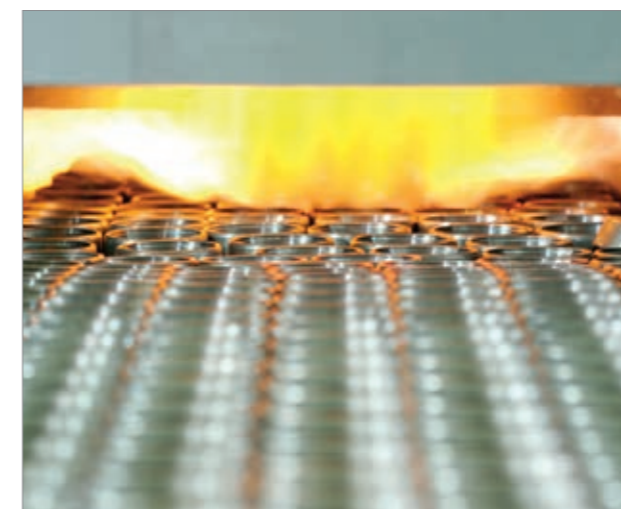
Of course the load on the bearings forms a very important factor during the selection of a bearing. The LFD Group has the suitable answer in its product range for an increased load.

Increased load – no problem!

Two-row LFD angular ball bearings are components with solid outer and inner rings and are able to absorb high radial forces and axial forces in both directions. Different cage variants such as polyamide, brass or sheet steel cages are refined according to the respective application and available accordingly. Likewise, the angular ball bearings can be delivered in open and sealed variants.

Two-row LFD angular ball bearings with double-sided seal faces or cover plates are filled with lithium soap grease and as a result are maintenance-free. These are for example used in disc harrows.

In addition to the two-row angular ball bearings, cylinder and tapered roller bearings are a permanent component of the LFD product range. For highest loads, LFD utilises roller bearings in different applications. Cylinder and tapered roller bearings of the LFD Group are utilised in different versions in drive engineering, axles and bogies of agriculture as well as construction equipment.



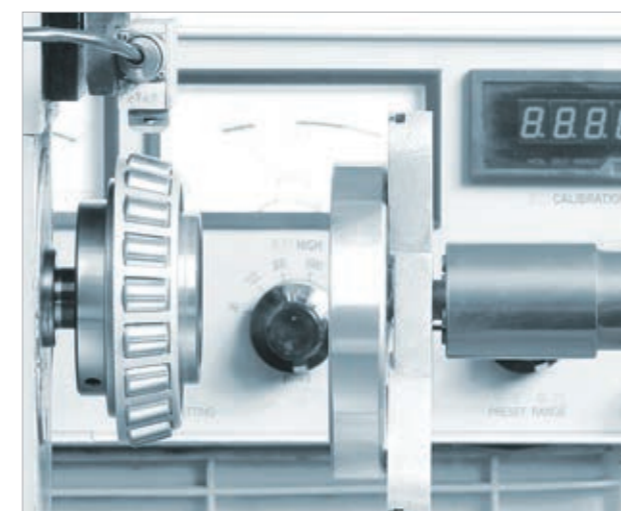
Applications using LFD bearings

As already stated above, the products of the LFD Group are used in a large variety of applications in agriculture as well as in construction equipment. The LFD Group already counts notable manufacturers of transmissions and axles to its satisfied customers. Applications are for example transmissions, disc harrows, axles, bogies, wheels, rollers and much more.

Testing continues

The LFD Group has its own test benches in order to continuously verify the high quality standard of the LFD bearings and to be able to perform service life analyses in-house. On our test benches, the bearings can be loaded either in an axial or radial manner. Furthermore, a combined load is also possible.

In the course of the test process, the test conditions such as the temperature of the oil-circulating lubrication, the test forces and the engine speed are monitored continuously. During testing, these test conditions can be kept constant or they can be adjusted accordingly. The test is documented with the relevant test conditions and characteristic values during the entire test phase.





Images: © SELL MEDIA COMPANY - Norbert Sell - Image: Background © BEINLICH-Beregnung.de

Irrigation technology: **Reliability is key!**

When the sun beats down and no rain has been forecast, then modern agriculture relies on hose reel irrigation machines by Beinlich. Here, LFD bearings belong to the most important components of these machines.

If plants are to grow, they must be watered. Any gardening enthusiast knows this. However, in the context of the agriculture sector, this no longer involves a watering can, but instead requires science. The following ques-

tions arise in connection with this: How much watering for which plant, from when and at which time intervals? The answers depend among others on the weather, the type of soil, its inhomogeneity and the soil moisture.





Image: © BEINLICH-Beregnung.de

In the agriculture sector, factors such as efficiency, water and energy saving, environmental compatibility and workload play a crucial role. In regard to this, agronomists, institutes and trade associations provide important information and decision guidance on the irrigation practice. After all, large areas are involved and the yield is the decisive factor. Reliable and efficient technology is required for this, in order to be able to survive with high productivity in the face of tough competition.

Very good performance of the Beinlich irrigation machines

The Beinlich company has been developing hose reel irrigation systems for more than 40 years.

The basic principle of the hose intake powered by turbines has proven to be the best one and today still forms the basis of the largest irriga-

Increase productivity with mobile irrigation technology

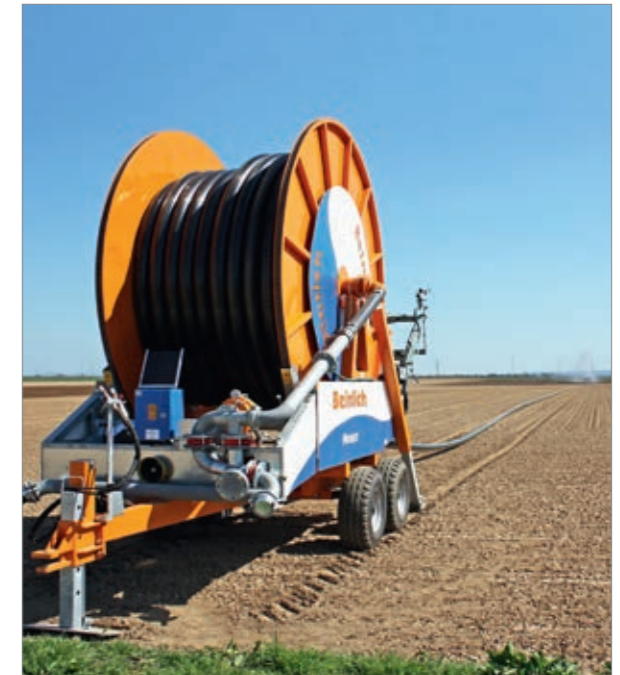


Image: © BEINLICH-Beregnung.de

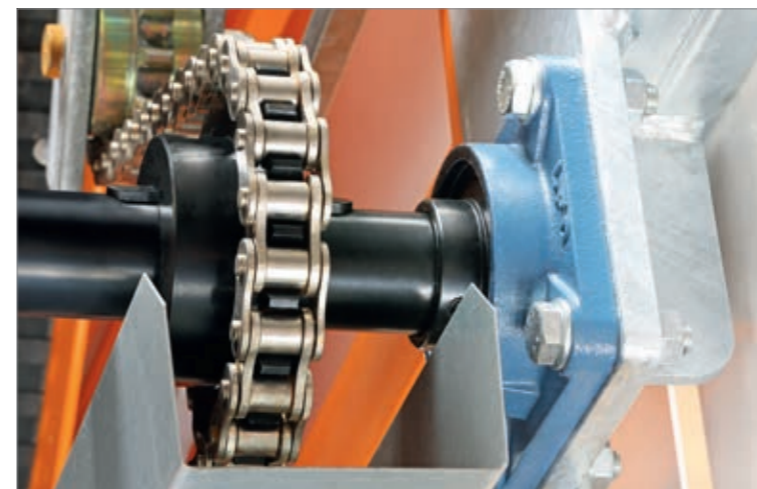
tion machine in the world. However, the control technology, the operation and driving safety as well as the operating comfort have been fundamentally developed further. The irrigation water is conveyed in elastic special polyethylene hoses, which are laid out at up to 1000 m in the field. During the irrigation procedure, the PE hose must be wound back on the reel at a precise constant speed. Only in this manner can the desired amount of precipitation be applied accura-

tely. Today, Beinlich is the only leading manufacturer of large-scale machinery that offers lengths of 1000 m. With the use of a machine installation, up to 8 ha can be irrigated.

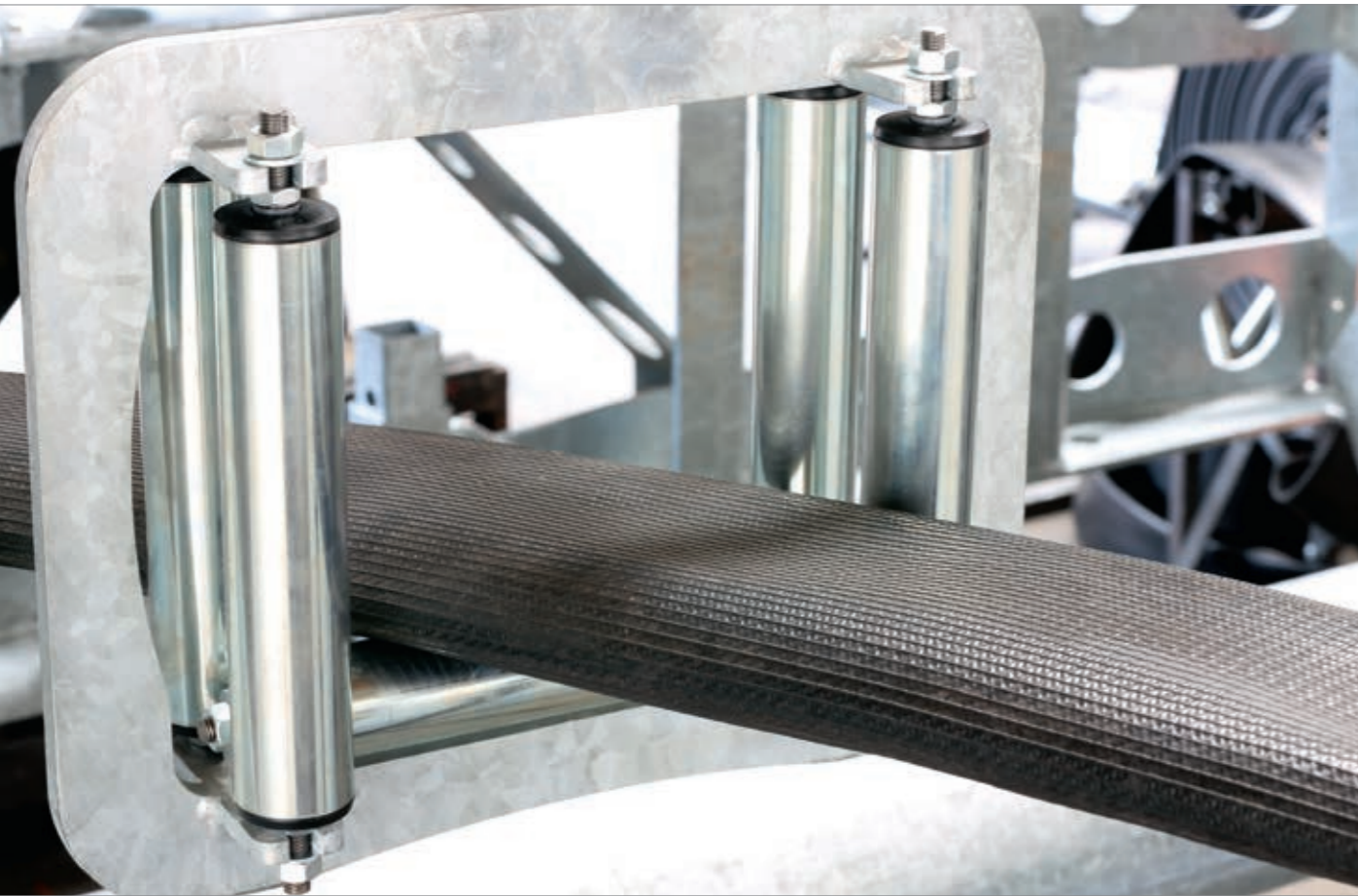
40 years in operation – due to the correctly selected bearings

It goes without saying that the Beinlich reel drum irrigation machines are fitted with the latest electronic control technology. The mechanical components of the machinery that are ever-increasing in size, receive a growing importance. These must be designed for extreme strain: The enormous tensile forces and long PE hoses as well as the extremely large stresses acting on the rotating parts must be absorbed by high-grade machine components. This includes bearings by LFD in different versions. Only in this manner can the flawless function be ensured for many decades.

A few examples should be provided: The rotating steel drum is equipped with a stainless steel axle, which ends in LFD pillow block bearings that are installed in a flanking manner.



Images: © SELL MEDIA COMPANY - Norbert Sell

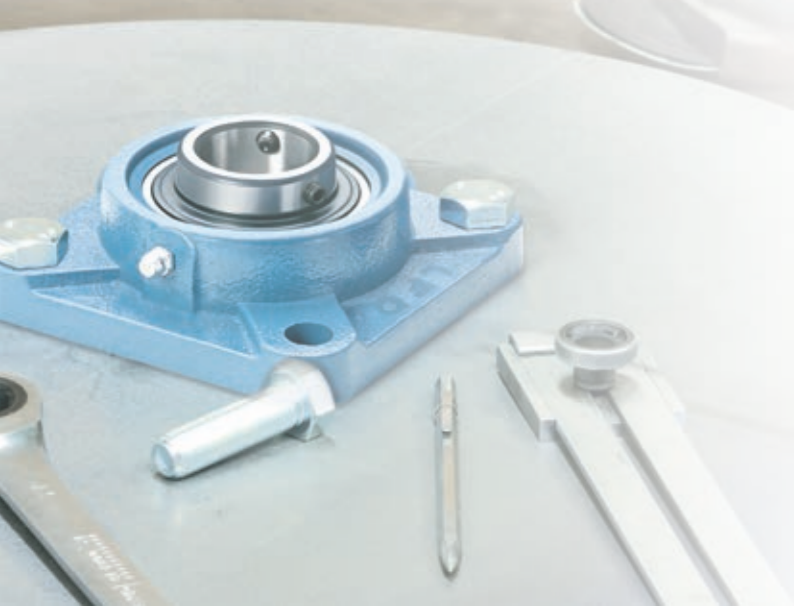


The weight of the heavy steel drum is supported at this point and here the high tensile forces of the hoses rubbing against the ground during winding up are absorbed.

The triple roller guides of the reel cart are designed for robustness, as enormous lateral forces are generated during the winding up of the hose. Precise winding up along the entire width of the drum is required, which is extremely difficult, when it has been laid down laterally in the track.

Deep groove ball bearings by LFD have been installed in the bushing of the reel cart. They support the function of the guide bolt, which follows the groove of the spindle shaft.

In turn, the spindle shaft is supported on both sides with accurately adjusted LFD flange bearings, ensuring fault-free operation.



Images: © SELL MEDIA COMPANY - Norbert Sell



PROVIDING PRECISION





**For each requirement
the right bearing solution**

The functional requirements presented here are only in regard to the hose for the water transport. These alone provide an impression of the wide performance range that LFD must cover with its high-quality bearings, in order to meet the un-

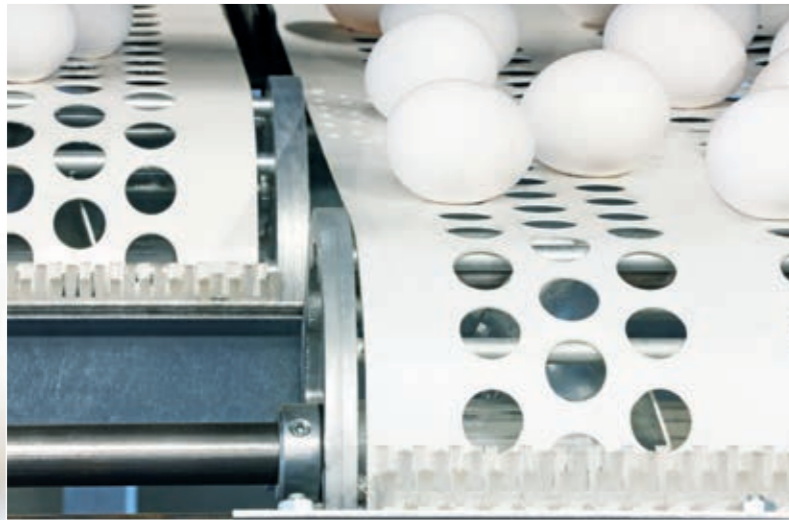
compromising requirements set by Beinlich. This is not only in regard to loads and construction shapes. It is also in regard to the environment to which the hose reel irrigation machines and the LFD bearings are exposed: Under the toughest conditions in open land, such as sun, snow, rain, wind, dust and sand, the LFD bearings master their

tasks with brilliance. For this reason, it is not an exaggeration to award the bearings by LFD the special quality label "durable open land technology" (German designation: "langlebige Freiland-Technik"). They have more than earned it with their tireless work on fields all over the world.

Images: © SELL MEDIA COMPANY - Norbert Sell

HIGH-TECH for laying hens

How the family business FIENHAGE ensures that the raw eggs are handled with the greatest of care during production.



Images: © SELL MEDIA COMPANY - Norbert Sell



End consumers look very closely when they purchase eggs: The smallest crack in the shell and the carton will remain on the shelf. This is one of the greatest challenges for egg production. All the more, as contrary to free-range farming an economical egg production with species-appropriate animal husbandry is practically only possible with space utilisation over several levels.

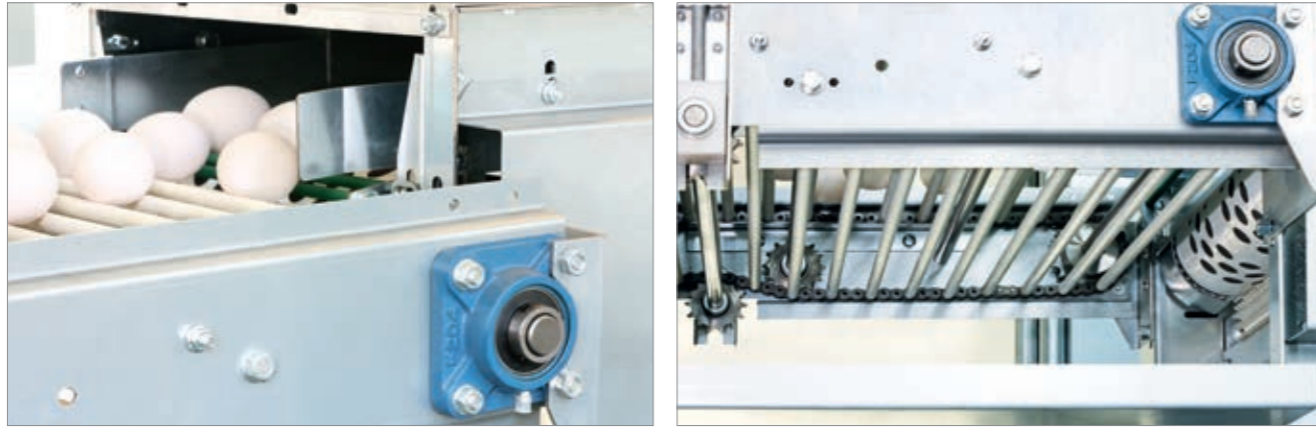
During the production process alone, this requires demanding transport logistics. Only 0.1% of the production, i.e. only each thousandth egg may become damaged.

The family business FIENHAGE Poultry-Solutions GmbH is a recognised partner for poultry equipment. It produces systems, which range from the rearing of laying hens up to the packaging.

Guide unit for the crosswise egg collection



Designed for cost-effectiveness



As essential products these include special guide units for the crosswise egg collection and the S-curve system for the transport from the aviary to the cross conveyor.

LFD bearings as decisive components for requirement-specific transport solutions in egg production

Even though the eggs are positioned on the guide unit for the crosswise egg collection without

touching each other, they are placed very close together. For this reason, the conveyor belt must run virtually free of vibrations and juddering – and this with lengths of up to 150 m.

The same applies to the tackling of height differences, which in practice in some instances can be 8-9 m. With these dimensions, the quality of the bearings is a decisive construction criterion. FIENHAGE relies on the precision products of the German manufacturer LFD.



Images: © SELL MEDIA COMPANY - Norbert Sell

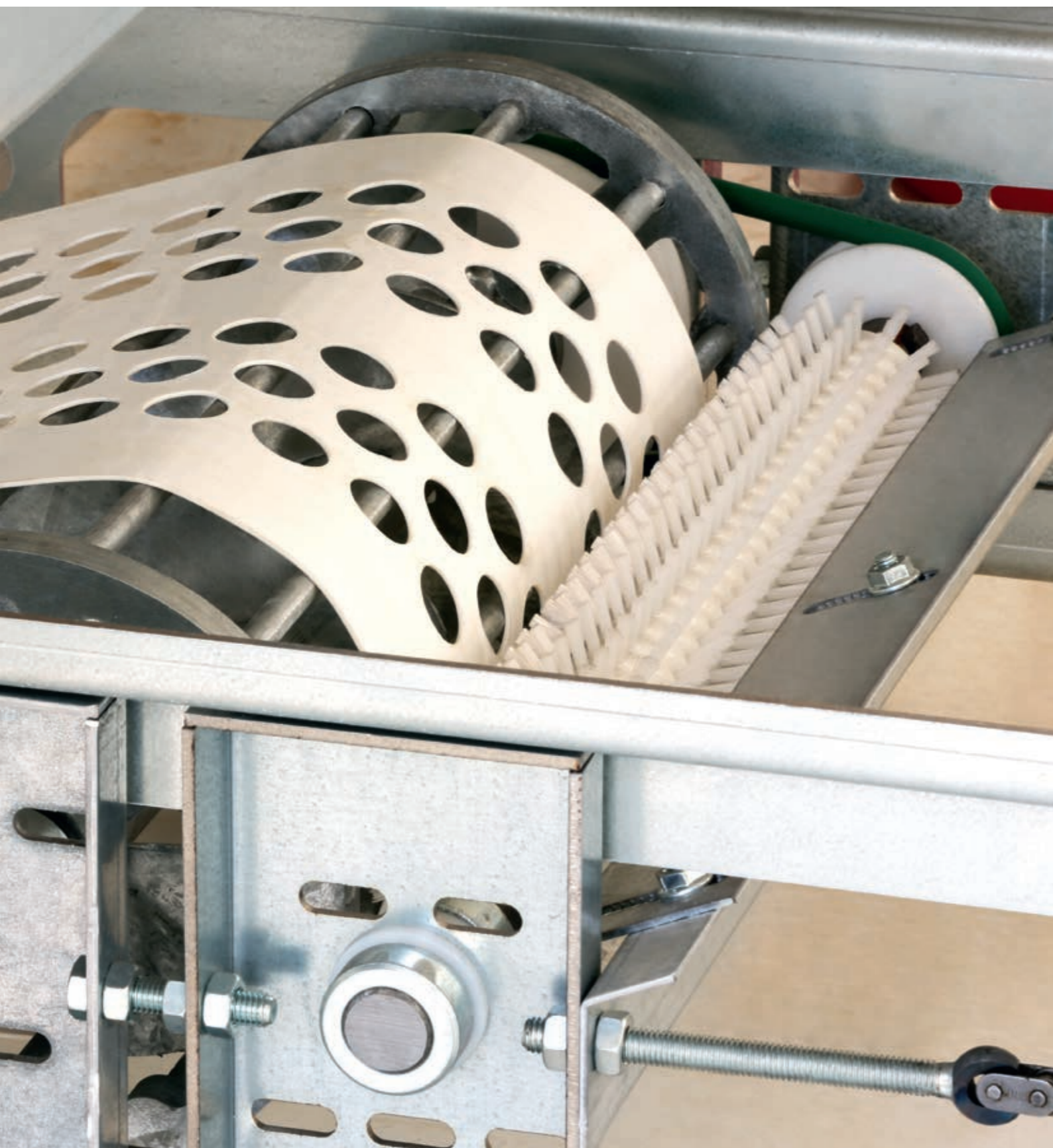


PROVIDING PRECISION



GERMAN STANDARDS





Images: © SELL MEDIA COMPANY - Norbert Sell



Active support as a factor for success

Here, the continuous load of the bearings does not pose the specific challenge. Instead, the other aspects that the transport solution and therefore also the bearings must meet: Soiled environment, maintenance-free operation and an extraordinarily long service life.

FIENHAGE delivers worldwide and for this reason tests extreme application situations. In the course of this testing, the company among others intentionally installs teeth offset in the test assemblies. Under such conditions, operating periods of up to 15 years are simulated.

Selected bearings must work flawlessly along such a time span without the need for re-lubrication. LFD supports FIENHAGE in regard to the construction and testing with advice and assistance in order to ensure that this objective is achieved. The support service in this collaborative partnership has been so successful that FIENHAGE'S systems equipped with LFD bearings met the required service life without difficulty.

The technology presented here ensures that the eggs reach the kitchen table intact. And when they taste good, then a successful start of the day is ensured.



Supply installation in an aviary system



Flange bearing in a sheet steel housing in an egg elevator



Flange bearing with a die-cast housing



Images: © SELL MEDIA COMPANY - Norbert Sell

Spherical plain bearings in mobile work machines

Spherical plain bearings are used whenever misalignments must be compensated and extremely high force loads must be absorbed.

One focal point is formed by mobile work machines from the industry sectors of agricultural and forestry machinery, construction equipment, all types of commercial vehicles as well as lifting and transport vehicles.

GÖDDE MASCHINENBAU GmbH among others produces boom mowers, accessory units for outriggers, pruning shears and concrete mixer buckets.

"We mainly use LFD standard solutions", warehouse manager Frank Oldiges explains. LFD spherical plain bearing technology is a strong brand of the LFD Group. The company often utilises the spherical plain bearings of the type GE40-DO. "We have made the experience that maintenance-free spherical plain bearings in the swivelling arm will begin to squeak after two to three months", he explains. For this reason, bea-

ring that can be re-lubricated are the better solution for the products of GÖDDE Maschinenbau GmbH. Overall, the maintenance-free bearings are often less suitable for the hydraulic system, as the load on the spherical plain bearings is too great in many application types.

Buyers require a quick orientation

For this reason, the online recoding guide is very helpful! It works very easily and provides quick information on a suitable product. Example: As a customer, are you looking for a specific spherical plain bearing or a rod end, however you are not familiar with the LFD product designation? No problem.

The LFD online database contains more than 20,000 designations of spherical plain bearings or rod ends. You enter what you are familiar with – even designations of third-party suppliers – and you will find the corresponding LFD product.





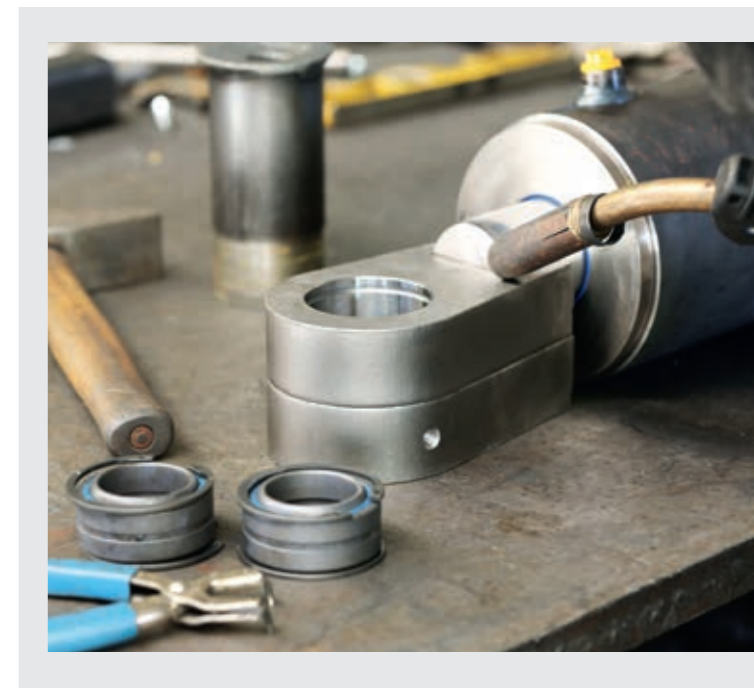
**TILTS
SWIVELS
TURNS
MOVES**



A spherical plain bearing tilts, swivels, turns and moves. This is the difference to normal bearings. The areas of application are particularly diverse. As a result, the product range extends from the smallest rod end of the K or E dimension series (DIN ISO 12240-4 / DIN 648) with a diameter of a mere 4 mm up to the largest spherical plain bearing (DIN ISO 12240-1 / DIN 648) with a diameter of 420 mm.

On commercial vehicles, LFD spherical plain bearings are used for exterior connections, controls, stabilisers and for the movement of heavy loading hatches, which are often connected to hydraulic cylinders. This also includes areas of trailer technology and earthmoving machinery.

Depending on the respective application, the spherical plain bearings have various tasks in completely different machines. In part, they are highly visible and provide a degree of mobility that is as free of resistance as possible.



Enormous loads for spherical plain bearings and rod ends



Images: © SELL MEDIA COMPANY - Norbert Sell





Everything that tilts, swivels and turns requires agility. This can most easily be observed in companies that are responsible for the manufacture or maintenance of mobile work machines.

Spherical plain bearings and rod ends in hydraulic cylinder technology

The use of LFD spherical plain bearings and rod ends is very diverse in hydraulic cylinder technology. Usually, the rod ends are secured with screws or

welded on to piston rods and piston tops. Folding cylinders are used in agricultural technology for the adjustment of the working width with spray rod assemblies, tedders, seed drills and meadow trains.

The track width adjustments of various vehicles are performed with the use of hydraulic cylinders, chassis cylinders with spherical plain bearings control the height adjustment, plough turning cylinders and bale grabbers, equipped with rod ends, can also be controlled hydraulically. In part, even

the shock absorbers of the chassis are fitted with spherical plain bearings. Additionally, rod ends are used in turnbuckles.

Enormous loads for spherical plain bearings and rod ends

Soil cultivation machinery such as boom mowers is exposed to enormous loads, which are caused by the type of ground conditions and extreme weather influences. The multi-part outriggers are mounted on a rotary column, the swivelling area is safeguarded by hydraulic cylinders. The LFD spherical plain bearing technology has proven itself during the high force loads due to impacts as well as loads as a result of dust particles, sand, but also boulders.

Reversible ploughs are fitted with variable rod assemblies for the stepless adjustment of the cutting width. These are integrated in the frame. Often hydraulic non-stop systems provide the required degree of mobility. Here LFD rod ends are the right choice. Forged ploughshares and quenched and tempered mould boards additionally ensure robust attachments.

INFO at: www.LFD.eu



Versatile use of spherical plain bearings on the superstructures of mobile machines



Versatile use of spherical plain bearings on tractors



Mobile mini-excavator with hydraulic pivot heads

Images: © SELL MEDIA COMPANY - Norbert Sell

AGRICULTURAL TECHNOLOGY



LFD HEADQUARTERS

Germany

Giselerstraße 9 - D 44319 DORTMUND

Phone + 49 231 977 250 - Fax + 49 231 977 252 50

Email info@LFD.eu - Internet www.LFD.eu

THE LFD GROUP

The LFD Group is represented on all continents.

In addition to the central warehouse in Germany, the LFD GROUP also has further storage capacity in Italy, the USA, Chile and China. Further world-wide representation ensures quick response and delivery times.

Please see your corresponding contact at:

www.LFD.eu/contacts

SIMPLY WELL-ENGINEERED