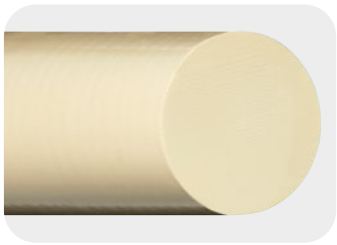
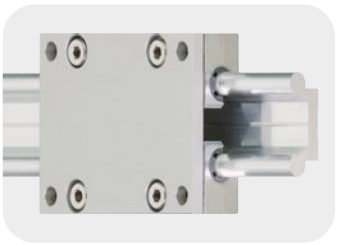
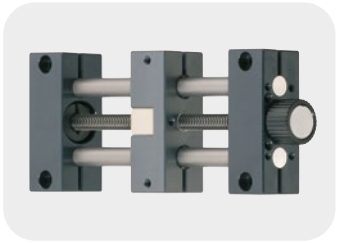
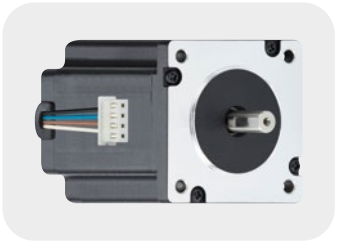
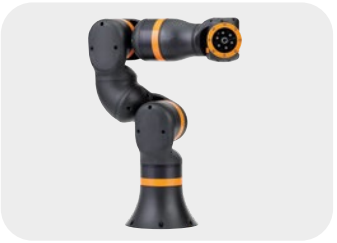
xiros®
ball bearings





dry-tech® | Lubrication-free made easy ...

xiros® ball bearings

Deep groove ball bearings

Fixed flange ball bearings

Ball transfer units

Conveyor rollers

Thrust bearings

Pillow block ball bearings

Slewing ring ball bearings

Other types

xiros®

Ball bearings

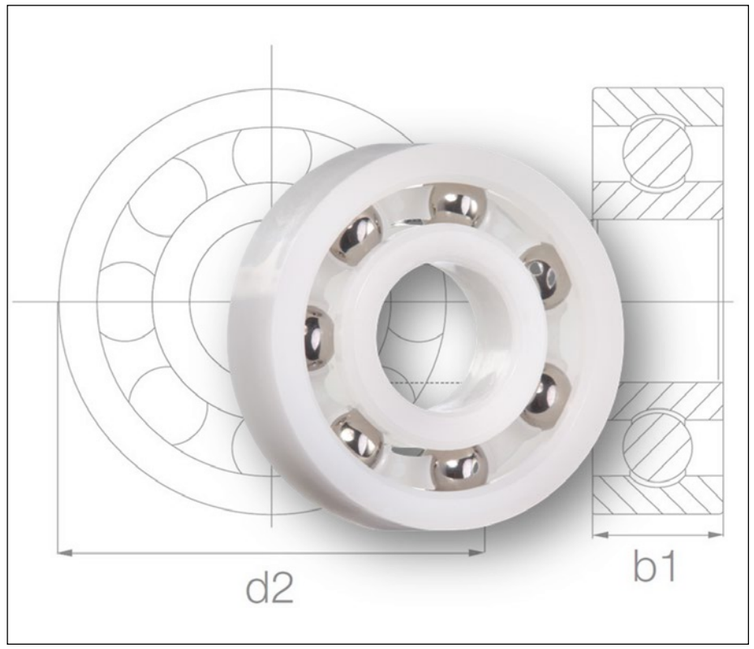
100% free from grease

xiros® plastic ball bearings revolutionise the ball bearing market. Thanks to freedom from lubrication and the use of xirodur® high-performance polymers, many applications can be successfully implemented in which conventional metal ball bearings are not suitable.

- Lubrication-free, low-maintenance and wear-resistant
- Avoid bearing damage and follow-up costs
- Tested in our ball bearing test laboratory
- Environmentally friendly, no additional lubricants needed

Introduction

Light and low-maintenance



Benefits
- Lubrication-free and low-maintenance
- Corrosion-resistant
- Non-metallic (due to the use of glass and plastic balls), therefore non-magnetic
- High media resistance, suitable for washdown
- Lightweight
- ESD or antistatic properties
- FDA-compliant (depending on material)
- Predictable service life

Typical application areas
- Packaging
- Textile industry
- Test engineering and quality assurance
- Optical industry
- Model making

xiros® plastic ball bearings require no additional lubrication, are corrosion-free and operate extremely quietly. This makes them a cost-effective alternative to metallic ball bearings. The components, which consist of a tribopolymer mixture, are lightweight, resistant to chemicals and optionally non-magnetic. This ensures safe use in medicine, packaging, food processing, drive technology and many other industries. Our xiros® ball bearings consist of a mixture of basic plastics, solid lubricants, fibres and filaments. The balls used are usually made of stainless steel, glass or plastic. These are mounted in a cage, which can be made from xirodur® own materials, PA, PP or PEEK.

Without ball bearings, the world would not be spinning properly, would it?
Because you simply see the world as it is. Everything grows and develops, is in motion and is taken for granted. However, people hardly ever think about such a marvel of technology: the ball bearing. You encounter it every day in your life, whether you're travelling to work by bike, train, bus or car. Because ball bearings are found in all means of transport, and also in kitchen appliances, training equipment in the gym or at the bowling alley in the evening - we find ball bearings everywhere.

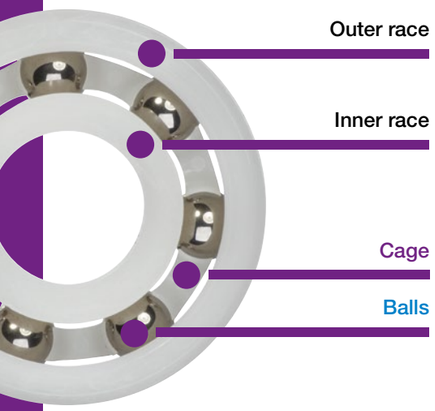
But what is a ball bearing anyway?
Since the development of the steam engine and the beginning of industrialisation, ball bearings have become indispensable in our everyday lives.

Ball bearings, also known as rolling element bearings, are bearing components that reduce the frictional resistance caused by rolling bodies between an inner race and an outer race. They are used to fix axes and shafts and can absorb radial and/or axial forces, depending on the type. Due to their design, they also allow the shaft or other components that are mounted on an axis, such as a wheel, to rotate.

Deep groove ball bearings structure

The xiros® plastic ball bearings are single-row deep groove ball bearings based on DIN 625. The lubrication and maintenance-free ball bearings consist of four components:

The outer and inner races
The suitability of a xiros® plastic ball bearings is largely determined by the materials of the two races. These are made from igus® tribo-polymers to maximise service life and minimise friction. There are twelve materials to choose from. They allow different values for application temperature, media resistance and price.



The cage
The material of the ball bearing cage must fit well to the application. These materials are also very different in terms of chemical resistance and temperature. Within the xiros® bearing product range, the cages are already perfectly matched to the materials of the inner and outer races.

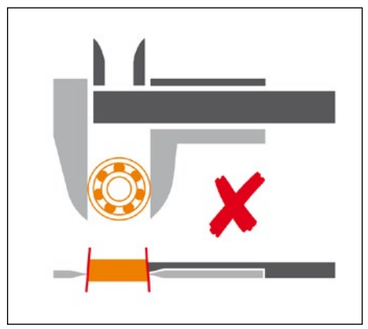
The balls
The ball materials differ most significantly. In addition to steel, glass or plastics are used. This produces a large difference in mass, which in turn affects quiet operation, weight and media resistance. Stainless steel balls (1.4401) are cost-effective, resistant to chemicals and suitable for high temperatures, but are the heaviest in the range. Glass balls (soda-lime glass) are also resistant to chemicals and have a medium weight. Just like polymer balls, they are non-metallic and non-magnetic. In addition to their excellent chemical resistance, the polymer balls (PAI) are even lighter than stainless steel or glass balls. Balls made of ceramics (zirconium oxide) are particularly suitable in application environments where high temperatures, corrosion and abrasion play a role. They also have a low porosity.

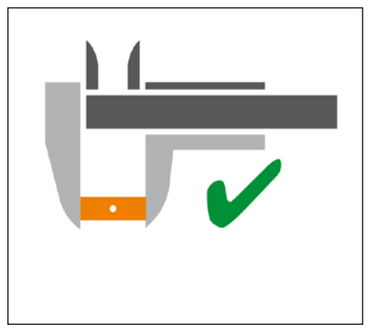
Tolerances and measurement recommendations
The tolerances for inner and outer diameters depend on the installation size. These are often approx. ±0.05mm to the nominal dimension. The bearing races are usually injection moulded and have a certain ovality by nature. For this reason, the caliper is used to measure 90° to the injection point (if present) across the entire width of the bearing. The dimensions and tolerances are designed in such a way that they fulfil a light press fit by hand when using a housing H7 and shaft h6. Additional locating spigot by means of a locking ring (shaft) and snap ring (housing) is recommended to prevent axial displacement.

Conveyor rollers
- Tube materials: aluminium, stainless steel, carbon and plastic
- Lengths up to 1,500mm
- Diameters from 20mm to 100mm

Thrust bearings
- Lightweight
- Smooth operation
- Wear resistance

Ball transfer units
- Abrasion-resistant and durable
- Large selection of materials and sizes
- Load capacity up to 1,470N





Measurement recommendation for our polymer ball bearings

Available variants

xirodur®	A500								B180						
Cage material	F500		PA		PEEK				B180		J3		PA		PE
Ball material	ES	GL	ES	GL	ES	GL	PAI	ZR	ES	GL	ES	GL	ES	GL	ES
Deep groove ball bearings	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fixed flange ball bearings									●	●			●	●	
End cap													●	●	
Spherical outer diameter													●	●	
Double row													●	●	
Slewing ring ball bearings									●	●					
Thrust bearings									●	●					

xirodur®	C160		ECO B180	F180		F182	F500	MT180	S180	S180 LF
Cage material	PP		J4	PA	PE	PA	F500	MT180	PA	PA
Ball material	ES	GL	ES	ES	ES	ES	ES	ES	ES	ES
Deep groove ball bearings	●	●	●	●	●	●	●	●	●	●
Fixed flange ball bearings				●					●	
End cap										
Spherical outer diameter										
Double row										
Slewing ring ball bearings										
Thrust bearings										

Cage material
PA = Polyamide
PE = Polyethylene
PP = Polypropylene
PEEK = Polyether ether ketone

Ball material
ES = Stainless steel
GL = Glass
PAI = Polyamide-imide
ZR = Zirconium oxide

xiros® ball bearings

Deep groove ball bearings

xirodur® B180
Cost-effective all-rounder
FDA-compliant

Cage material	**xirodur® B180**
Ball material	**ES, GL**

xirodur® B180
All-rounder

Cage material	**PA**
Ball material	**ES, GL**

xirodur® B180
All-rounder, for contact with food, FDA-compliant

Cage material	**PE**
Ball material	**ES**

xirodur® B180
Up to 21x longer service life

Cage material	**iglidur® J3**
Ball material	**ES, GL**

xirodur® B180
With shield

Cage material	**PA**
Ball material	**ES, GL**

xirodur® B180
With labyrinth seal

Cage material	**xirodur® B180**
Ball material	**ES, GL**

xirodur® C160
Resistant to chemicals

Cage material	**PP**
Ball material	**ES, GL**

xirodur® A500
The specialist for heat and chemicals

Cage material	**PEEK**
Ball material	**ES, GL, PAI**

xirodur® A500
The specialist for heat and chemicals, up to 120°C, FDA-compliant

Cage material	**PA**
Ball material	**ES**

xirodur® A500
The specialist for heat and chemicals, reinforced cage material

Cage material	**xirodur® F500**
Ball material	**ES, GL**

xirodur® A500
The specialist for heat and chemicals

Cage material	**PEEK**
Ball material	**ZR**

xiros® deep groove ball bearings and fixed flange ball bearings

xirodur® F180
Antistatic

Cage material	**PA, PE**
Ball material	**ES**

xirodur® F182
Electrostatically dissipative

Cage material	**PA**
Ball material	**ES**

xirodur® S180
All-rounder in black

Cage material	**PA**
Ball material	**ES, GL**

xirodur® B180
Double row

Cage material	**PA**
Ball material	**ES, GL**

Fixed flange ball bearings

xirodur® S180
Dimensionally identical with metallic counterparts

Cage material	**PA**
Ball material	**ES**

xirodur® B180
For conveyor rollers made of aluminium and PVC

Cage material	**xirodur® B180**
Ball material	**ES**

xirodur® S180
For conveyor rollers made of carbon

Cage material	**PA**
Ball material	**ES**

xirodur® B180
With double flange

Cage material	**PA**
Ball material	**ES, GL**

Fixed flange ball bearings
FDA-compliant

Housing material	**xirodur® B180**
Cage material	**xirodur® B180**
Ball material	**ES**

2-hole fixed flange ball bearings
Pivoting

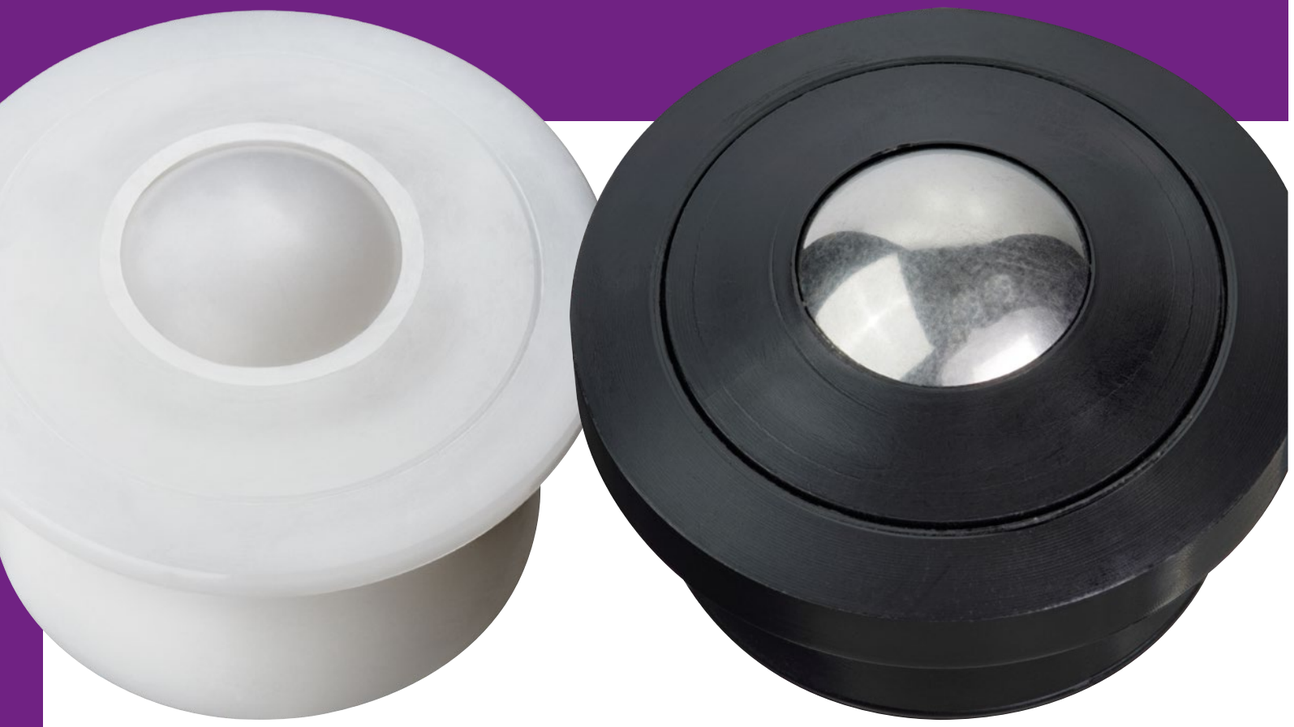
Housing material	**igumid® G**
Cage material	**xirodur® B180**
Ball material	**ES, GL**

4-hole fixed flange ball bearings
Pivoting

Housing material	**igumid® G**
Cage material	**xirodur® B180**
Ball material	**ES, GL**

xiros®

Ball transfer units



Many design concepts for solving complex applications

Fragile or heavy goods can be moved by ball transfer units without much effort. With igus® ball transfer units, it is easy to take loads of up to 1,470N, allowing you to transport heavy goodss in any direction. Our xirodur® material is characterised by its abrasion resistance and durability. Our ball transfer units are available with the following ball diameters: 5, 8, 12, 15, 22 and 30mm. In addition to plastic solutions, we also offer ball transfer units with stainless steel conveyor balls.

- Abrasion-resistant, durable and lubrication-free
- Avoid bearing damage and follow-up costs
- Tested in our ball bearing test laboratory
- Environmentally friendly, no additional lubricants needed

xiros® ball transfer units and accessories

Ball transfer units

xirodur® B180
Smooth running

Max. axial compressive force	**110N**
Ball material	**POM**

xirodur® B180
Smooth operation with high loads

Max. axial compressive force	**300N**
Ball material	**POM, ES**

xirodur® B180
Higher loads

Max. axial compressive force	**950N**
Ball material	**POM, ES**

xirodur® J3B
Sliding design for high impact loads

Max. axial compressive force	**1,470N**
Ball material	**ES**

xirodur® B180
With disc spring, for high impact loads

Max. axial compressive force	**300N**
Ball material	**POM, ES**

xirodur® F182
Electrostatically dissipative

Max. axial compressive force	**300N**
Ball material	**ES, ES**

xirodur® B180
Higher loads

Max. axial compressive force	**500N**
Ball material	**ES, ES**

xirodur® B180
Self-aligning

Max. axial compressive force	**300N**
Ball material	**ES**

xirodur® B180 / D180
Self-aligning

Max. axial compressive force	**300N**
Ball material	**ES**

Accessories

BB-515-CR
Clamping ring for ball transfer units

Weight	**0.9g**
Diameter	**24, 36mm**

xiros®

Conveyor rollers

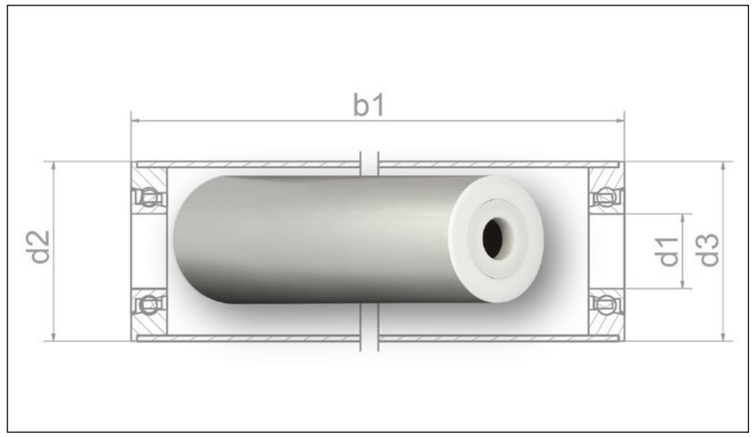
Lubrication-free and low-maintenance transport of goods

Our xiros® conveyor rollers are available in different tube materials, from stock: whether aluminium, stainless steel, carbon or with PVC tube. With diameters from 20 to 100mm and lengths of up to 1,500mm,we provide users with a wide range of conveyor rollers for the most specialised applications. Also special parts like ready-to-install conveyor rollers with shaft are no problem. Just talk to us.

- Long service life due to lubrication-free and maintenance-free polymer ball bearings
- Cost-effective precision extruded roller
- Online configuration for conveyor rollers
- Environmentally friendly, no additional lubricants needed

Introduction

What are the advantages of our conveyor rollers?



Benefits
- Free from additional lubricating greases
- Low maintenance
- Food-compatible
- Chemical resistance
- Temperature-resistant
- Antistatic
- Metal-free (depending on material)

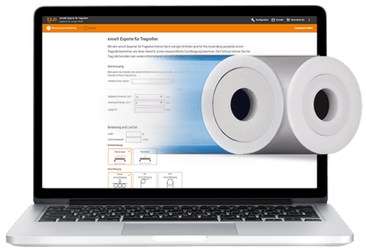
Typical application areas
- Material handling
- Food industry
- Beverage industry

With the ever-increasing requirements in conveyor technology, especially material handling, the demands on the materials used in the conveyed goods to be transported are also increasing. With increasing speed, one of the most important elements in drive technology must function reliably: the bearing. Conveyor rollers are available in a wide variety of designs: driven conveyor rollers made of steel, stainless steel, aluminium or plastic. They are there to establish rolling contact between the conveyor frame and the conveyor belt.

In principle, conveyor rollers consist of a supporting axis enclosed by a supporting shell, as well as deep groove ball bearings with flanges as end caps. Our guide rollers for roller conveyors can be used flexibly and can be equipped with different deep groove ball bearings depending on requirements. In addition to conveyor technology, xiros® conveyor rollers with ball bearings are used in labelling technology, packaging and the food industry, where they can also take on the function of a guide roller. There are several factors to consider when selecting conveyor rollers. First of all, load-bearing capacity is a decisive criterion. The conveyor roller must be able to safely bear the weight of the transported goods without deforming, sustaining damage or causing downtime. The durability of the conveyor rollers is also of great importance. They should be made of materials with high wear resistance to ensure a long service life.

Rolling friction must also not be ignored. The conveyor rollers should have an optimum surface finish to ensure sufficient grip on the conveyor belt or the transported goods. This contributes to the stability and safety of the conveying process. Ease of installation and maintenance also play a role, as downtimes of the entire conveyor system are avoided.

Configure conveyor rollers online
With the online tool for configuring xiros® conveyor rollers, you will receive the right product in just a few steps after entering your requirements. Simply enter the outer and inner diameter, determine the load and load case as well as the temperature of the application.



Smooth running and 100% lubrication-free are major advantages
In this labelling machine, polymer ball bearings are used in up to 36 conveyor rollers instead of metal solutions made of steel, which were too heavy and had to be lubricated. Their task is to guide the plastic film as it moves through the machine. Service life was increased and maintenance costs were lowered. Up to now, the polymer ball bearings have ensured that the conveyor rollers operate quietly and that the machine performs its task without interruption.

xiros® conveyor rollers

Conveyor rollers

Conveyor roller, aluminium
With flanged bearing, FDA-compliant

Cage material	**xirodur® B180**
Ball material	**ES**

Conveyor roller, aluminium
With textured surface

Cage material	**xirodur® B180**
Ball material	**ES**

Conveyor roller, aluminium
Black anodised

Cage material	**PA**
Ball material	**ES**

Conveyor roller, PVC
Non-metallic

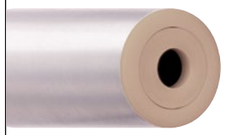
Cage material	**xirodur® B180**
Ball material	**GL**

Conveyor roller, PVC
Plastic approved for food contact

Cage material	**xirodur® B180**
Ball material	**ES**

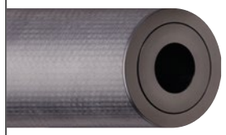
Conveyor roller, stainless steel
FDA-compliant components

Cage material	**xirodur® B180**
Ball material	**ES**



Conveyor roller, stainless steel
Continuous operating temperatures up to 150°C, FDA-compliant

Cage material	**PEEK**
Ball material	**ES**

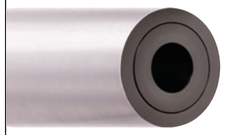


Conveyor roller, carbon
Antistatic with flange bearing

Cage material	**PA**
Ball material	**ES**

Conveyor roller, carbon
With all-rounder flanged ball bearings made of xirodur® S180

Cage material	**PA**
Ball material	**ES**



Conveyor roller, stainless steel
Antistatic

Cage material	**PA**
Ball material	**ES**

Conveyor roller, aluminium
Non-stick coated

Cage material	**PA**
Ball material	**ES**

xiros® axial ball bearings, pillow block ball bearings and slewing ring ball bearings

Thrust bearings

Axial thrust washers
Good resistance to chemicals and seawater

Race material	**xirodur® B180**
Ball material	**ES, GL**

Thrust bearings
Single row, FDA-compliant

Race material	**xirodur® B180**
Ball material	**ES, GL**

Thrust bearings
Double row to absorb higher loads, FDA-compliant

Race material	**xirodur® B180**
Ball material	**ES, GL**

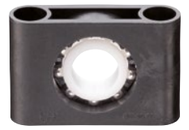
Pillow block ball bearings

UC pillow blocks
Cast iron housing

Race material	**xirodur® B180**
Ball material	**ES**

Spherical insert bearings
For UC housing

Race material	**xirodur® B180**
Ball material	**ES**



Pillow block ball bearings
Pivoting or fixed version

Housing material	**igumid® G**
Ball material	**ES, GL**

Pillow block ball bearings
Materials with food approval, FDA-compliant

Bearing material	**xirodur® B180**
Ball material	**ES**

Slewing ring ball bearings

Slewing ring ball bearings
Extremely smooth running

Race material	**xirodur® B180**
Ball material	**ES, GL**

Slewing ring ball bearings
Higher load capacity

Race material	**xirodur® B180**
Ball material	**ES, GL**

xiros® slewing ring ball bearings and other designs

Other types

Slewing ring ball bearing
Outer toothed profile

Race material	**xirodur® B180**
Ball material	**ES**

Radial deep groove ball bearings, one-piece design
Profiled ball bearing replaces several components

Race material	**xirodur® B180**
Ball material	**ES**

Roller guide
The alternative to classic cross roller guides

Ball material	**ES**
Length	**90, 100mm**

Skate wheel with spherical outer diameter
One-piece design

Race material	**xirodur® B180**
Ball material	**ES, GL**

Self-aligning ball bearings
Angular misalignment compensation

Race material	**PA**
Ball material	**ES**

End caps
1:1 replacement

Race material	**PA**
Ball material	**ES, GL**

End caps
For screw/nut M8

Race material	**PA**
Ball material	**ES**

Skate wheel, large
Cost-effective solution one-piece solution

Race material	**PA**
Ball material	**ES, GL**

Guide roller, with double flange
Suitable for flat belts

Race material	**PA**
Ball material	**ES, GL**

Multi-axis bearings
For rotary and linear motions

Race material	**xirodur® B180**
Ball material	**PP**

Application example

Up to 40% fuel savings through automatic drive systems for ships

bound4blue supplies automatic wind-assisted drive systems that use renewable energy for all ship owners and operators who want to reduce their fuel costs and pollutant emissions and save up to 40% of fuel consumption. The shipping industry is a massive cause of environmental pollution and faces costly emission reduction regulations that present it with a double challenge: fuel consumption accounts for between 30 and 60% of a ship's operating costs, depending on fuel costs and ship type and size. In addition, shipping is a major contributor to global CO_2 emissions as well as nitrogen oxide (NOx), sulphur oxide (SOx) and particulate (PM10) emissions, which are really harmful to ecosystems and human life (acid rain, greenhouse effect, cardiovascular diseases, etc.).

Two complementary drive systems have been developed that are completely automatic and adjustable to adapt to any wind situation. They allow for fuel savings of up to 40%. One of them can be folded down onto the ship's deck. These systems are designed as additional drive for maritime transport and generate effective thrust from the available wind, an affordable and clean source of energy.

What was needed?
Alternatives to metallic solutions that are lightweight, low-maintenance and can withstand low-speed loads perfectly.

Solution
The plastic ball bearings BB-6004-B180-30-ES were used as the solution for the first application due to their high corrosion resistance and low weight. They were incorporated as the main bearings of the Pitot system (instrument for measuring atmospheric pressure), which is an important sensor of the wing sail system.

xirodur® B180
Cost-effective all-rounder
FDA-compliant

Cage material	**xirodur® B180**
Ball material	**ES, GL**

motion plastics®