



The Bearings

Important Terms

ABEC

Bearings are the heart of the skates. The quality of skate bearings varies a lot. For quality assessment of bearings, the so-called ABEC-term (Annular Bearing Engineering Committee) has become the most popular one. ABEC is a manufacturing standard of accuracy and manufacturing tolerances of the bearings. The tolerances are based on μ -mm! Usually you divide between ABEC 1, 3, 5 or 7 bearings. The higher the ABEC rating, the better the quality.

BUT

It should be noted, that the quality of a bearing depends on various factors such as the materials used for the various components of a bearing, the choice of the lubricant etc..

It's possible that a poorly greased ABEC 7 bearing is worse than a well lubricated ABEC 1, bearing from a quality point of view.

ILQ

- ILQ is simply a term that is used by Twincam bearings for marketing reasons
- ABEC is the term of an industrial standard concerning the tolerances of products

Twincam has successfully created the ILQ term which obviously is related to the ABEC rating. The higher the ILQ standard the better the quality of the bearing. Twincam does use this term for marketing purposes and not to define quality standards. But Twincam bearings are known for fast spin and high quality. We also know that the ABEC rating is not the one and only factor to separate the good bearings from the bad ones as described above.

Well, make up your own mind and test the different types of bearings to find out which one you like the best.

Freespin

The Freespin Technology is used in Powerslide ABEC 5 and ABEC 7 bearings. We use a special lubricant for the bearings with the result that the bearings spin very well and long. Powerslide freespin bearings are an inexpensive alternative to tune your skates. Some of our racing complete skates are equipped with freespin bearings ex work.



Materials – Outer ring and Raceway

Cronitect

High-strength, wear-and corrosion-resistant materials are essential for high-quality bearings. They must also operate reliably under extreme conditions, such as under poor lubrication conditions (lack of lubrication) or even dry running. The Cronitect bearings from INA / FAG is a product of the consistent further development of the solutions already offered.

Cronitect refers to the combination of an almost universally available-hardening martensitic stainless steel with a thermochemical surface layer treatment process and is characterized by high corrosion resistance and high wear resistance.

Chrome Steel

Chrome steel belongs to the group of stainless steels. The steel can be alloyed and unalloyed with a special degree of purity. Chrome steel is used for high quality bearings. Basically it is used not only for the bearings with higher ABEC number, but also for (quality) ABEC 1 bearings. Chrome steel bearings are suitable for both beginners and professionals. The material has a long lifetime, if the bearings get maintained on a regular basis. Contact with water should be avoided so that the material does not rust and the bearings loose performance.

Carbon Steel

"Carbon" is a high tech material. But the name misleads most of the people in terms of bearings. The opposite is the case in terms of bearings. Carbon steel has less quality than chrome and is used only for cheap bearings. The material is very soft and wears off quickly. The processing of the raceway is usually not as good as bearings made of stainless steel. Carbon steel bearings have more friction between balls and raceway and therefore run significantly slower.

Note: Carbon steel ABEC 7 bearings are of poorer quality than chrome steel ABEC 1 or ABEC 3 bearings. Speed skaters or ambitious fitness skater should use chrome steel or ceramic bearings.

Stainless Steel

The definition, a stainless steel is a "chemically very pure," "rustprooven" or "non corrosion" steel, is inaccurate and false. A stainless steel does not necessarily correspond with the requirements of a non corroding steel. The corrosion resistance is only guaranteed if the surfaces has been treated by fine sanding to make it really smooth, as it is the case with the Powerslide / Twincam SUS stainless steel bearings. WE use WNr 1.4021 (X20Cr13), AISI 420 for our SUS bearings.



Titanium

Bearings with titanium alloy are rarely offered. The titanium alloy ensures a very hard surface and galvanises the metal. Titanium bearings have a longer lifetime due to its hard material and less friction. The titanium alloy coating protects the bearing also from corrosion.

Ceramik

A distinction is made between full ceramic ball bearings and hybrid bearings. Balls and raceways of full ceramic bearings are made of ceramic. Hybrid bearings only feature balls made of ceramic. The raceway is made of chrome steel. Full ceramic bearings require no lubrication, are corrosion resistant and have a long lifetime if you maintain them on a regular basis. Hybrid bearings are slightly cheaper, but need lubrication and are conditionally sensitive to water. The operating characteristics are significantly better compared to chrome steel bearings.



Material – The Cage

Steel Cage

Steel cages are widely used in bearings, but have disadvantages compared with cages made of composite material such as:

- Higher weight
- Impacts may deform the cage
- May start to rust if poor quality is used – see information above about the different materials

Nylon Cage

Composite cages are often made of nylon. In some cases they are reinforced by fiberglass in order to increase the fracture toughness. Cages of Twincam bearings even include an additional mix of Teflon material to minimize the friction even more.

The disadvantages that were mentioned in the steel cages are the advantages of the composite cages.

Material – The Shield

Steel Shield

As mentioned before, the quality of the steel makes the difference in the quality of the bearing. Bearings of all quality classes are equipped with either one side or two sides steel shields. Low end bearings use shields which are not removable. Means you are not able to open them to maintain your bearings. Better bearings use a removable shield with a so called C-ring.

Advantages of C-ring shields:

- non contact shields
- No additional friction
- No additional increase in temperature
- Up to the speed limit applicable
- Good seal against leakage of lubricants
- Long term maintenance-free

Disadvantages:

- Limited protection against contamination of dust and water

Composite Shield

A common material for composite shields is a low-friction PTFE (polytetrafluoroethylene). Bearings with the suffix 2RS the shields are designed like a labyrinth, making it difficult to get contaminated by dust and water, but is not able to prevent it at all.



Closed and semi open Bearings

Bearing with two metal shields have the suffix "ZZ". A standard bearings for example is called 608ZZ. Half open bearings with just one shield are called 608Z. The open side of the bearing should be always point towards the inside of the wheel to protect it from dust and water. Some skaters take the shields completely out of the bearings and skate it "open."

Advantage of a (semi-) open bearing:

- Easier maintenance
- Slightly lower weight

Disadvantages of a (semi-) open bearing:

- Contamination from dirt and water
- Lubricant evaporates quickly
- Shorter intervals for maintenance



Lubricants

Low friction Oil

Many types of synthetic oils can be found in the market. Each top skater has his own "secret agents" and reveals not know what "secret weapon" he uses to make its bearings as quickly as possible.

Synthetic oils can differ in their viscosity. The higher the viscosity the more liquid the oil.

In general you can say:

High viscous lubricant:

- is easier to spread in the bearing
- creates less friction (bearing runs faster)
- evaporates faster – results in more frequent intervals of maintenance

Fat

Fat is used mainly in low end inline skates. The running performance is reduced due to the higher friction and you won't find any bearings of speedskater using fat as lubricant.

You can improve the rolling performance of grease-lubricated bearings the longer you skate the bearings. The fat becomes more liquid due to the fact that the temperatures inside the bearing increases during skating. The advantage of grease lubricated bearings is that the lubricant does not evaporate as quickly and dust / dirt can not penetrate as easily.

Teflon

Teflon is mixed in part as a lubricant additive. It improves the operating characteristics of the bearing.



ABEC 9 Bearings – real or fake?

Short answer – they are all fake!

Skate manufacturers and discount retailers advertise more and more that their skates are equipped with ABEC 9 bearing and suggest to the customers a very high quality equipment of skates. In truth, however, it is ultimately ONLY the print on the shield that has just changed for marketing reason.

We have previously learned that the ABEC is a term for tolerances in the production. These tolerances are in the μm area. The higher the ABEC number, the more precisely is the tolerance between inner diameter of a bearing compared to the outer diameter.

We contacted INA / FAG Germany, one of the well recommended manufacturers of all kind of huigh quality bearings to find out the costs for an ABEC 9 bearing. The result was astounding:

A single (real) ABEC 9 bearing would cost us at Powerslide about 50,00 EUR as a wholesaler. Say 16 bearing about 800 EUR. The Retail price would be correspondingly higher.

It is therefore inconceivable that inline skates at all feature ABEC 9 bearings and for sure especially those in the price range of 59,99 EUR to 199,99 EUR.

BUT – the market wants ABEC 9 bearings and seems nobody really cares about it.

Original Swiss bearings or Swiss Copy bearings?

The Powerslide swiss bearings are originally made in Switzerland. A lot of Swiss bearings in the market are just made in Asia. Ask the skate manufacturer to tell you the producer of their Swiss bearings.

The Swiss berings from Powerslide are made at WIB (Wälzlager Industrierwerke Bulle), in Bulle/Switzerland.

I can't find any ABEC rating on Swiss bearings – why?

Swiss bearings are well known for their high quality standard in terms of manufacturing tolerances as well as for their excellent running properties. The manufacturer manage to promote their bearings without ABEC rating. Above we already said that the ABEC rating term misleads to the assumption that the higher rating automatically generates a better quality. We have described above but various factors influence the quality of the ball bearing so that the ABEC-code is to be regarded only as an inadequate measure of quality.



608 standard vs. 688 standard

The mark 608 stands for standardization of a manufacturing process. The number 60 represents the production series and the number 8 stands for the inner diameter of the bearing. Fitness skates are usually equipped with 608 bearings.

Micro bearings are marked through the number 688. They are smaller and lighter than the 608 bearings. The wheel must have a special hub to fit 688 bearings or the skater must use adapters to fit the bearings properly into wheels with regular 608 hubs.

Advantages and Disadvantages of 608 and 688 Bearings

688 advantages:

Weight (only 3,4g)
9 balls (for better distribution of the pressure)
Better acceleration

Disadvantages:

It's not so easy to keep up high speed for long periods of time
More susceptible for dust and dirt
Not as easy to maintain (smaller parts)

608 advantages:

Maintain high speed easily for long periods of time
Easy maintenance
Large variety

608 disadvantages:

More weight compared to 688 bearings

How to maintain my bearings

The first signs to maintain a bearing are noises or heavy spin of bearings. To save some money you should maintain your bearings regularly.

Please follow the advice below:

- Disassemble the wheels from the frame
- Open the shields (if possible) with a needle
- Place the open bearings in a small container (e.g. turbo wash of Powerslide) that is filled with citrus cleaner or other cleaning liquids.
- Clean bearings carefully with a toothbrush
- Dry the cleaned bearings on a towel
- Grease the dry bearings with synthetic oil or other stuff
- Close the bearings again and assemble the bearings into the wheels.



Powerslide Care Products

Turbo Wash
Citrus Cleaner (zum Nachfüllen vom Turbo Wash)
PS oil
Teflon Lube
Teflon oil
Grease Injection (with Teflon)
Grease Spray
Care Set (oil, Cleaner, Y-Tool, Pins, Brush)
Caramba Synthese Oil
Caramba Super Plus Oil
Caramba PTFE Spray

How often do I have to maintain my bearings?

There is no general advise how often you should clean your bearings like there is no information how often you should wash your car. Every skater is different. Some maintain their skates and bearings almost every day, some wait until they loose performance and some just exchange parts.

Dust, water and dirt can damage the honed and polished raceways and balls of a bearing and has influence on the performance of the bearing and in the end on the speed of your skates. You can extend the lifetime of your bearings through regular maintainance. Nice side effect – you safe maney. It really depends on many factors how often you should clean your bearings as you can see.

But please note that also rustproof bearings need to be maintained. Dust and dirt also damage the raceways and balls of the bearing. The bearing just does not rust.

Please note: Always maintain your bearings after skating in wet conditions!!!

Are there any rustproof bearings in the market?

Yes, there are rustproof bearings.

Powerslide/FAG Cronitect bearings

Well this bearing has its main advantages under dry conditions. But the Cronitect steel that is used for this bearing makes it also perfect for rain conditions.

Kalon Dobbin was one of the first Powerslide skaters who tested the new Powerslide / FAG Cronitect hybrid ceramic bearings. His first test was a fast spinning test. Kalon could not believe his eyes when the time stopped at 7'30" minutes and tested the spin a few times more, always a similar result. He broke his freespin rekord by about 1'15" minutes.

The next test was a blind test with his former teammate DJ Nation. He prepared one skate with the new ceramic bearings and left the other side unchanged. During the skating session

DJ asked Kalon if he could have a look at his skates. One side felt slow and his first thought was that something was not correct with the skate. Instead it was the better bearing on the other skate that made his normal setup feel slow...

These bearings have been developed and produced in close cooperation with INA/FAG Germany. Every little detail of the bearing is optimized to limit the friction and weight.

- * The Cronitect steel is about 10 times harder than regular chromesteel and cannot get damaged. It is also 100% rustproof
- * The bearings contain 5(!) balls only, made of high quality ceramics to limit the friction and overall weight. Balls are made in the USA
- * The cage is made of POM material, which repels water and guarantees super freespins
- * The bearing is open on one side
- * The lubricant is high tech synthetic oil
- * The overall friction has been reduced by 49% compared to current bearings on the market
- * The overall weight has been reduced by 12,5% to now just 10,5g
- * The bearings still spin perfectly even under wet conditions which makes them perfect for rain competitions, also because even afterwards they never rust, so they can be used time and time again in the rain.

All these features make the Powerslide / FAG Cronitect bearing easily outperform any other bearing on the market.

Until now a bearing was just a bearing, but this new Cronitect bearing is a MUST to have.



Powerslide / FAG brand new "Magic" Cronitect bearings

Twincam SUS bearings
Text, text, text,

But please note that rustproof bearings need maintenance as well!



How does the bearing press work?

The bearing press is a useful tool for quick change of wheels and bearings.

- a. taking off bearings
 - Take off wheels from frame
 - The lever of the press is in upright or open position
 - Put the wheel on the little hook of the press
 - Take off the bearing by pressing down the lever
 - Follow the same procedure with the rest of the wheels

- b. put in bearings
 - The lever of the press is in upright or open position
 - Put the following items one after another on the little stick of the press (1. first bearing 2. spacer 3. wheel 4. second bearing)
 - Close the stick again
 - All parts will be combined when pressing down the lever
 - Follow the same procedure with the rest of wheels

The bearing press from Powerslide is equipped with two different sticks which can be exchanged. One of them is fitting 8mm spacers (for speedskating), the other should be used for fitness skates where 6mm spacers are common.

The Powerslide bearing press is fitting 100mm wheels.

Which spacers fit my speed skates?

Common skates are equipped with 8mm axles. This means that 8mm spacers will be needed. There are specific spacers for micro (688 standard) and macro (608 standard) bearings. Some wheels have a slightly wider core caused by tolerances in the production, which causes problems. The wheel does not spin freely, due to pressure on the sidewalls of the frame (bearing boss). Powerslide offers different length of high precision spacer to solve this problem

Powerslide offers spacers for micro or macro bearings in 10 packs and 8 packs for 8mm axles (Speed and Salomon) or 6,2mm axles (RB, K2, Roces, etc.)