

The **six** advantages of linear plain bearings

What it really means to go from a rolling to a sliding system

Linear bearing systems create sliding technology for maximum design potential. drylin® linear solutions offer a powerful core, as their plastic bearing liners are optimized to make the systems maintenance-free. Along with the innovative sliding properties of the liners are a wide range of rails, bearings and customizable combinations that allow engineers the ability to combine the right components and bring design ideas to life.

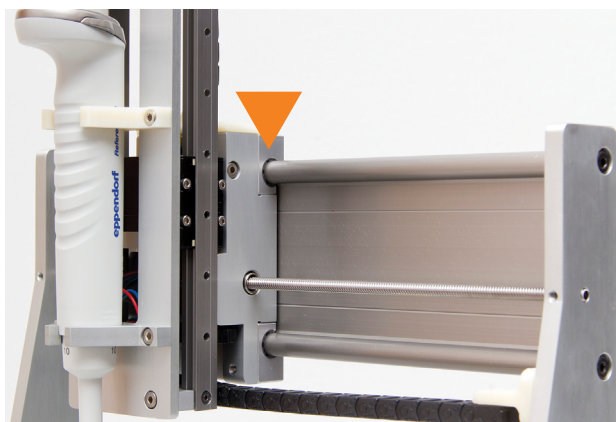
The most widely-used alternative to drylin® is recirculating ball bearings. Though ball bearings are an established choice for generating linear motion, making the switch from a rolling ball bearing to a sliding plastic linear bearing can drastically reduce failure, downtime and costs. igus® kept ease of replacement in mind when creating drylin®, as many of the systems are dimensionally interchangeable with recirculating metal bearings.

What makes all drylin® systems worth applying, whether it be an application in the works or an existing system with ball bearings? Guaranteed self-lubrication, shock resistance, corrosion resistance, dirt resistance, light weight and quiet operation.



Self-lubrication

igus® plastics are engineered with base polymers for wear resistance, fibers and filaments for reinforcement, and solid lubricants to lubricate the system independently and reduce friction. When movement occurs in the linear systems, there is a material transfer of the lubricant into the micro-finish of the shaft. Once the transfer is made, the material cannot be washed away, meaning the systems operate without any external lubrication.

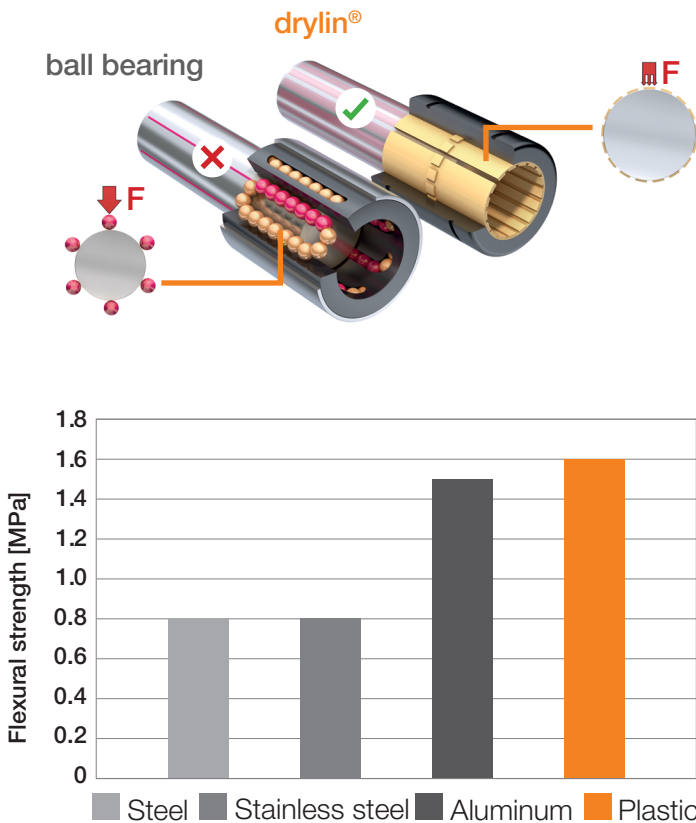


Clean pipetting

All drylin® linear bearing systems are 100 percent dry-running. This is extremely beneficial, as most studies done on bearing systems will report that the number one problem with any system is lubrication-related failures. These failures can be caused by improper maintenance, incorrect lubrication practices or dirt adhering to the external lubrication. The lack of messy oil and grease in drylin® means that dust or dirt particles never adhere, making them hygienic and ideal for use in lab automation, furniture or food packaging machinery. The self-lubrication also makes the solutions odorless and environmentally-friendly.



Shock resistance

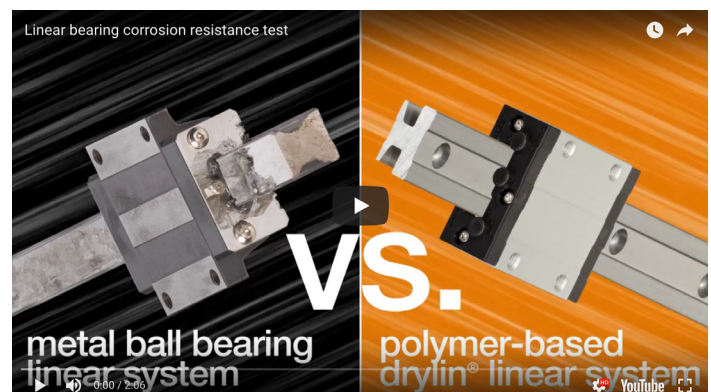


The plastic sliding elements and the overall design of drylin® make the systems extremely resistant to strong shocks and impacts. Primarily, the plastics are embedded with fibers and filaments, which help to absorb high forces and edge loads. Metal ball bearings, on the other hand, do not do well with high static loads, shock loads or vibrations.

With the structure of recirculating ball bearing systems, a load is concentrated in the form of a permanent load on point-to-point contacts, which may damage the shaft. The drylin® sliding liners are designed to disperse loads over a large surface area, lowering overall surface pressure. drylin® plastic liners have the highest flexural strength (the material's resistance to failure when placed under a load) in comparison to aluminum, steel and stainless steel. The maximum recommended surface pressure for drylin® goes as high as 150 MPa (21,756 PSI).

Corrosion resistance

The combination of corrosion-resistant thermoplastic bearing liners and rail systems made of soft stainless steel (including 300-series) or hard-anodized aluminum makes drylin® very resistant to corrosion. Ball bearings can damage soft stainless steel, and therefore require a hardened surface. Hardened stainless steels, however, are more prone to corrosion. The drylin® combination of highly alloyed stainless steel (e.g. 316T) with high performance plastic (e.g. iglide® T500/X) is ideal in cleaning-intensive industries, filling equipment, food processing and packaging, and saltwater applications.

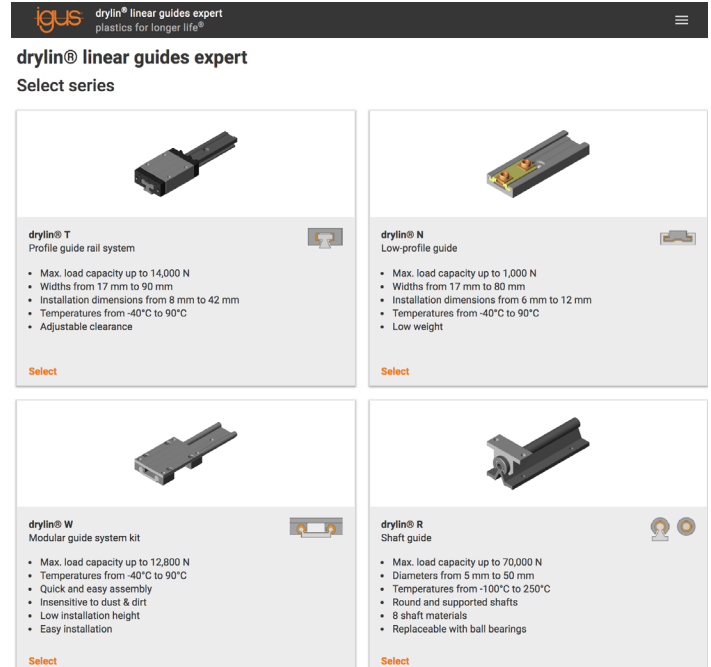


video: linear bearing corrosion resistance test

Dirt resistance

drylin® linear bearing systems are engineered to have an extended, continuous service life, even when put in environments subjected to dirt or dust. The sliding elements made of high-performance plastics do not require any external lubrication and thus give ambient dust, dirt, sand or chips little chance to adhere—they are essentially self-cleaning.

The geometry of drylin® gives it additional dirt-resistance. The patented grooves serve two important purposes. If thermal expansion occurs, the grooves swell away from the shaft, which prevents the bearing from seizing. The grooves also act as dirt channels so dirt and debris can easily pass through the bearing system. Foreign bodies are simply conveyed out of the raceway by the contact surface between the plastic sliding element and the guide.



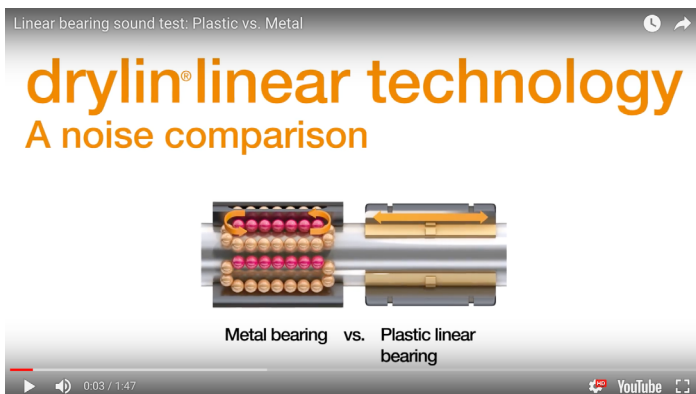
drylin® linear guides expert
plastics for longer life®

drylin® linear guides expert
Select series

drylin® T Profile guide rail system • Max. load capacity up to 14,000 N • Widths from 17 mm to 90 mm • Installation dimensions from 8 mm to 42 mm • Temperatures from -40°C to 90°C • Adjustable clearance	drylin® N Low-profile guide • Max. load capacity up to 1,000 N • Widths from 17 mm to 80 mm • Installation dimensions from 6 mm to 12 mm • Temperatures from -40°C to 90°C • Low weight
drylin® W Modular guide system kit • Max. load capacity up to 12,800 N • Temperatures from -40°C to 90°C • Quick and easy assembly • Insensitive to dust & dirt • Low installation height • Easy installation	drylin® R Shaft guide • Max. load capacity up to 70,000 N • Diameters from 5 mm to 50 mm • Temperatures from -100°C to 250°C • Round and supported shafts • 8 shaft materials • Replaceable with ball bearings

Try the drylin® expert system to calculate system service life under dirt exposure

Quiet operation



Linear bearing sound test: Plastic vs. Metal

drylin® linear technology

A noise comparison

Metal bearing vs. Plastic linear bearing

0:03 / 1:47

YouTube

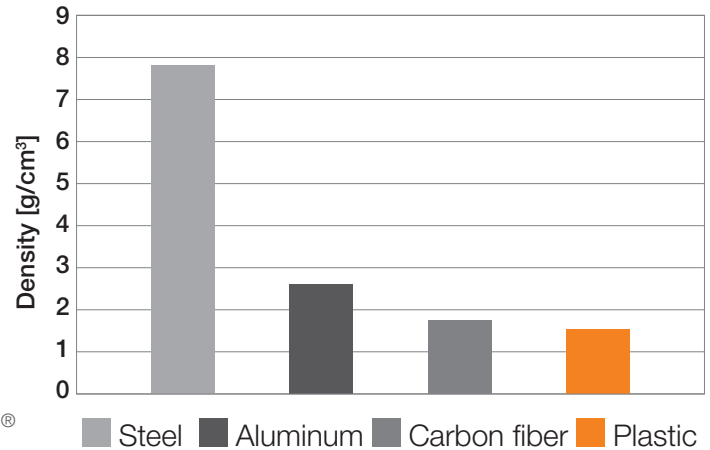
video: linear bearing sound test: plastic vs. metal

All drylin® plastic linear bearing solutions are exceptionally quiet-running. Since drylin® systems slide on low friction plastic instead of rolling on steel balls, significantly less noise and vibration is generated. The average noise output of drylin® technology is 20 dB, making it four times quieter than corresponding metal. Metallic bearings have a noise level comparable to a running vacuum, whereas drylin® is equivalent to a running refrigerator.

Light weight

Conventional recirculating ball bearings are predominately made of heavy steel, whereas drylin® linear technology uses plastics and aluminum, making drylin® much lighter and more versatile. Energy consumption and emissions are reduced by the low weight, and physical load and transport costs are reduced. The lightweight design allows high acceleration of the sliding elements, which reduces mass inertia and can decrease wear on motors, pulleys, and other machine components.

For applications that require extremely low weight, drylin® is available with a very light and durable carbon fiber rail, resulting in a weight saving of 25 percent compared to aluminum. The carbon is also 75 percent lighter than steel rails, and the plastic slides weigh 80 percent less than conventional steel slides. Added to this is the low overall height of drylin®, which makes system weight lower.



To find more information about drylin®, check out the [linear motion content library](#) or the [online shop](#).