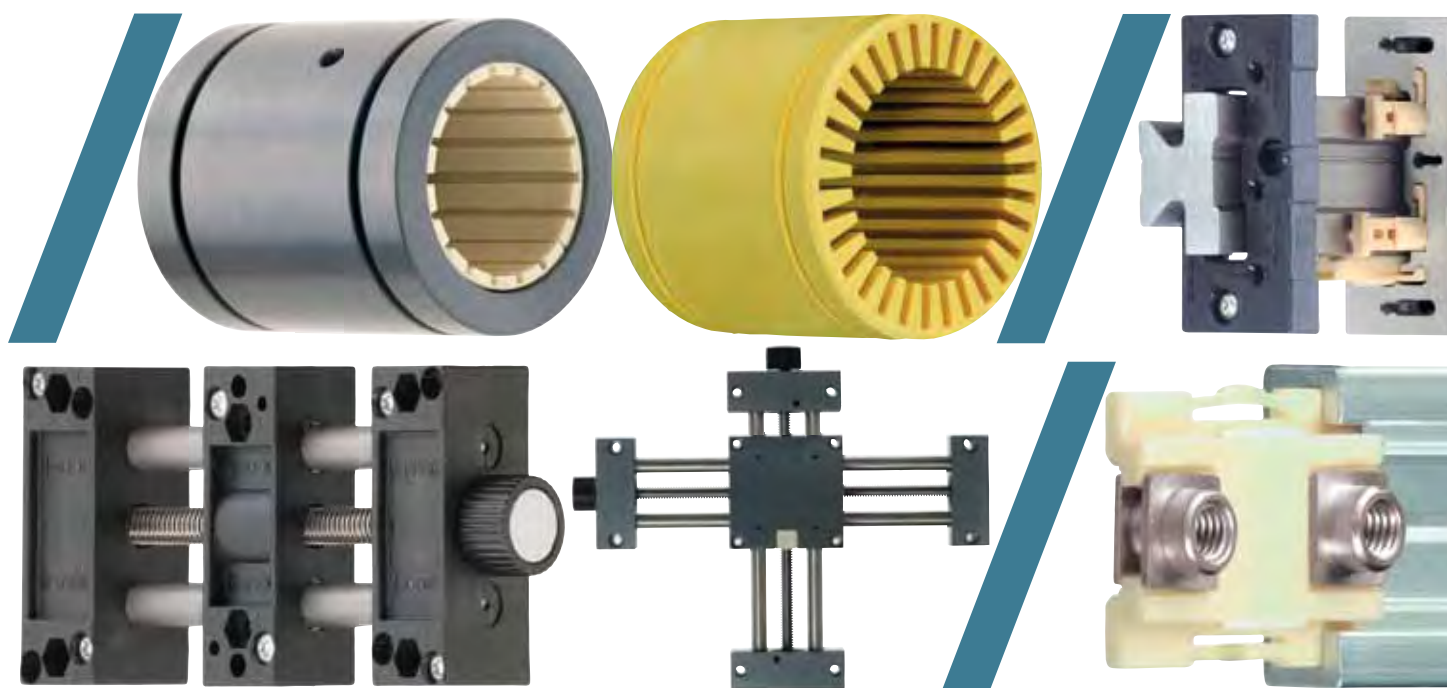


# 3. DryLin<sup>®</sup> / ...

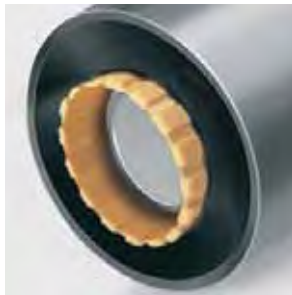
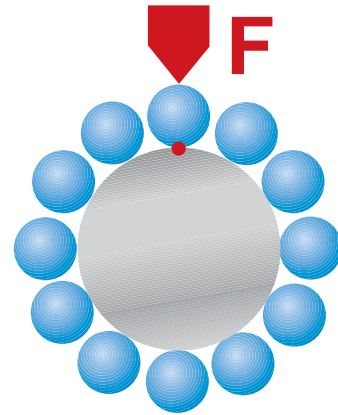
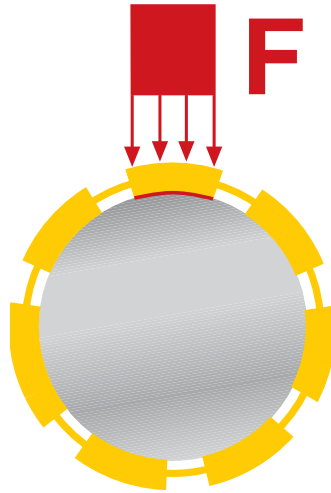


.plastics

DryLin® is a range of maintenance-free, lubrication-free linear slide bearings consisting of four main product lines. Principal features in addition to zero maintenance are strength and resistance to external influences such as soiling, moisture, chemicals, heat and impact.

## Advantages

- Maintenance-free
- Dry running performance
- Resistant to dirt, dust or moisture
- When weight reduction is important
- For short stroke applications
- Self-lubricating
- Extremely quiet operation
- Wear resistant
- Corrosion resistant
- Resistant to shocks and vibrations
- Low friction value
- High static load capacity
- High speed and high acceleration



Ball bearing system



igus® DryLin® linear bearings

## Lower Surface Pressure

DryLin® linear bearings work through the use of sliding elements, in contrast to the design of recirculating ball bearing systems. This results in a larger contact surface subjected to a much lower pressure. The advantages are decisive:

- Compatibility with non-hardened shafts
- and even non-metallic counterparts
- complete avoidance of seizure



Picture 60.1: Resistant to dirt, dust and moisture

## Dry running, without Lubrication

Designed for dry running, DryLin® linear bearing systems run without grease or oil; this permits operation even in the presence of heavy soiling or sand (Pic. 60.1). During motion, the contact surfaces push foreign particles outward, i.e. the slides' front surface acts like a scraper. As a result, the contact surfaces remain clean.

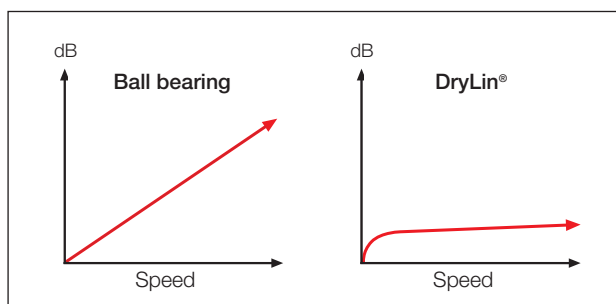
## No Minimum Stroke Lengths

Compared with recirculating ball bushings, DryLin® bearings' operating characteristics do not depend on the length of travel, nor do they impose any requirements concerning minimum stroke. Even applications with extremely short strokes are no problem for DryLin® linear bearings.

## Quiet Operation

The smooth operation is also attributable to the difference between rolling and sliding (Graph 60.1): No mechanical rolling against hard surfaces, no collisions between balls resulting in loud running noises.

Sliding motion is extremely quiet, only a low "swishing" noise is heard.



Graph 60.1: Comparative noise generation

## Materials

igus® offers various materials for sliding elements and counterparts forming part of DryLin® linear systems. Years of test data have proven that iglidur® J, J200 and X are the best materials for most linear applications because of the excellent wear properties and low friction value.

## Suitable materials for the DryLin® series

	DryLin® T	DryLin® N	DryLin® W	DryLin® R
igidur® J	●	●	○	●
igidur® J200	○	○	●	○
igidur® X	–	–	–	○

● standard      ○ available      – not available

## Optimum Material Combinations

### igidur® J

igidur® J material gliding on different surface materials achieved the best results in our tests. Comprehensive laboratory tests showed that iglidur® J is by far the most suitable polymer material for linear motion applications.

Special characteristics of iglidur® J:

- Maintenance-free dry operation
- Lowest friction value on all materials
- Excellent wear resistance
- Very low moisture absorption

► [more about iglidur® J Chapter 3](#)

### igidur® J200

igidur® J200 material is especially developed for hard anodized aluminium surfaces. Gliding on hard anodized aluminium achieved the best results in all lab tests.

Special characteristics of iglidur® J200:

- Maintenance-free
- Extreme durability using anodized aluminium
- Low abrasion using anodized aluminium
- Excellent wear resistance using anodized aluminium

► [more about iglidur® J200 Chapter 27](#)

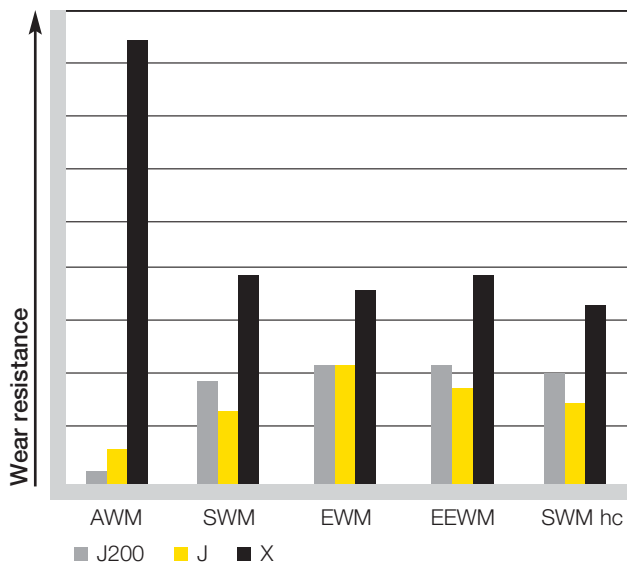
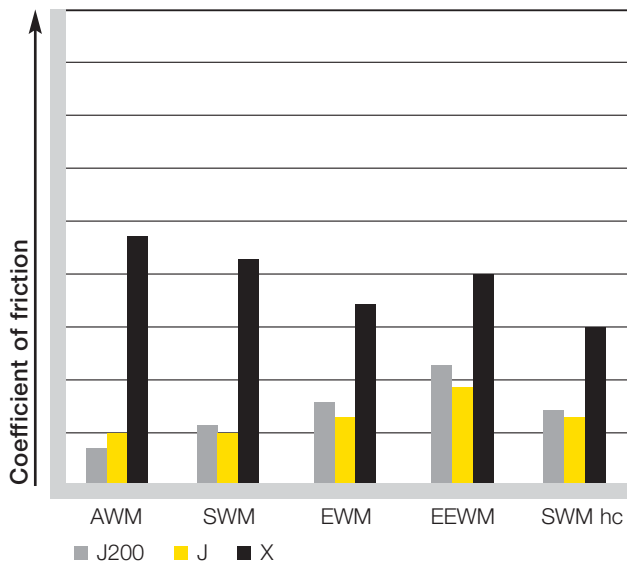
### igidur® X

igidur® X is defined by its combination of high temperature resistance with compressive strength, along with high resistance to chemicals. iglidur® X achieves the best wear results with stainless steel and chrome-plated steel shafts.

Special characteristics of iglidur® X:

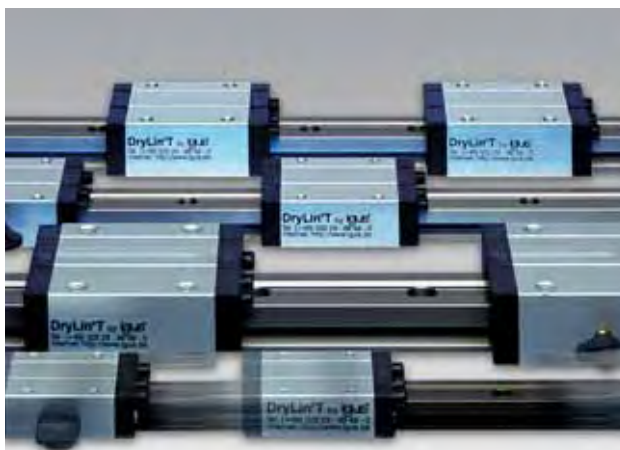
- Maintenance-free
- Temperature resistant from -100 °C to +250 °C in continuous operation
- Universal resistance to chemicals
- Very low moisture absorption

► [more about iglidur® X Chapter 6](#)

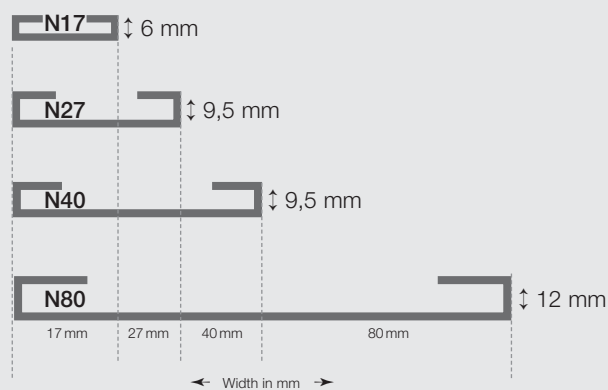


- AWM(P):** Hard-anodized aluminium shaft – h10 or h8
- SWM:** Hardened and ground steel shaft – h6, (1.1213)
- EWM:** Hardened and ground stainless steel shaft – h6, (1.4125)
- EEWM:** Hardened and ground stainless steel shaft – h6, (1.4034)
- hc:** Hard chrome-plated and ground steel shaft – h7, (1.1213)





Miniature	Size 09	Size 12	Size 15
Standard			TW-HKA
		Size 15	
		Size 20	
		Size 25	
		Size 30	



## DryLin® T Profile Guide Rails

### DryLin® T

#### ► Chapter 61

The first group consists of the profile guide rails. DryLin® T guide rails are designed to be dimensionally interchangeable with most traditional recirculating ball guides.

The DryLin® T system is made up of adjustable carriages running against a hard anodized aluminium T shaped rail. The anodized aluminium carriage fits onto the rail and is guided by 3 sets of adjustable sliding elements. These sliding elements are designed so that an adjustment of the bearing clearance to the guide rail can be performed.

On the whole, the system is designed less on high precision, but rather for performance for the most diverse – even extreme – environment. Also included in the DryLin® T family is the TK04 series. This non-adjustable series offers a similar profile in smaller sizes. The light-weight and effective design of these guides is especially impressive.

- Permits adjustments to the play of guidance systems (Series 01)
- Very resistant to dirt
- Very low coefficient of friction and wear

## DryLin® N Low Profile Guide Rails

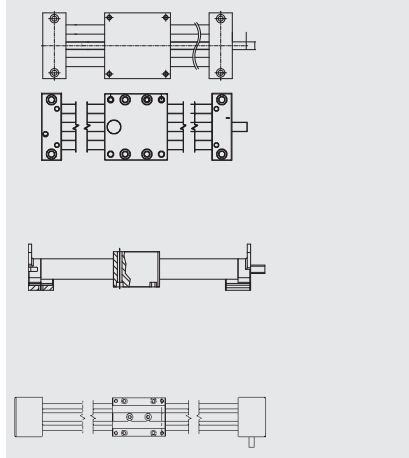
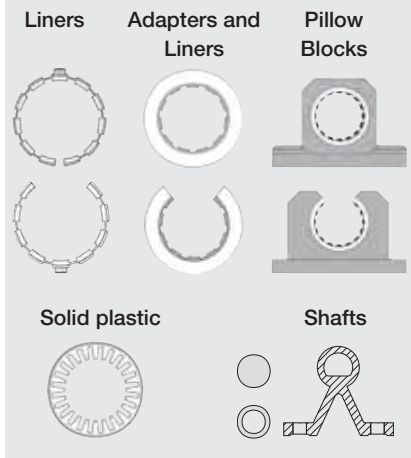
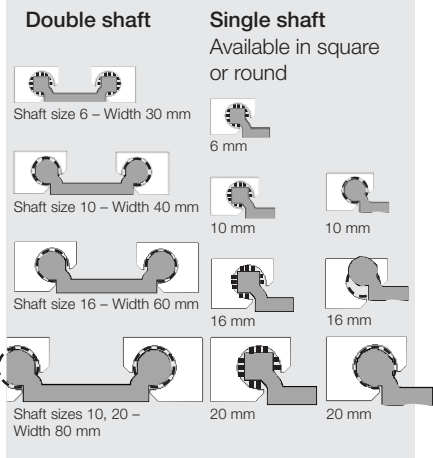
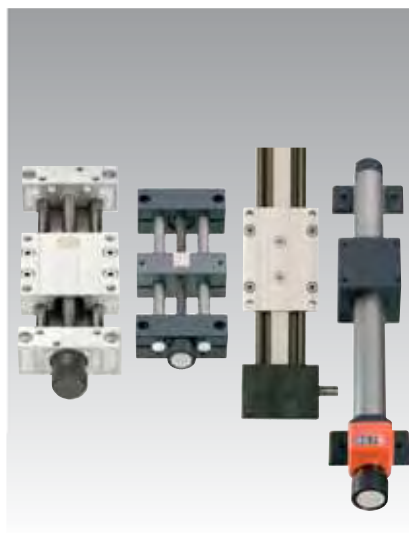
### DryLin® N

#### ► Chapter 62

The low-profile series DryLin® N offers extremely low profiles in various widths.

Like all DryLin® products the carriages run without grease or oil in an anodized aluminium profile. The selected materials and the unique design make DryLin® N a cost-effective and flexible guide system. DryLin® N fits on all commonly-used aluminum profiles.

- Most economical solution
- Lightweight due to aluminum polymer combination
- carriage runs within the rail



DryLin®  
Linear Plain Bearings

Phone +49 - 22 03 - 96 49-145  
Fax +49 - 22 03 - 96 49-334

## DryLin® W Flexible Linear Guide Systems

DryLin® W ► Chapter 63

DryLin® W uses J200 liners similar to DryLin® R, but is offered as a cost-effective, assembled system. The design of DryLin® W promotes flexibility of design, and ease of assembly with both single and double rail configurations:

- The single rail system, which can incorporate a floating square linear bearing, compensates efficiently for extreme shaft misalignments.
- The double rail system totally eliminates the need for shaft alignment, offering a single, bolt-on solution.

Hard anodized aluminium is used as the rail material, thus DryLin® W also offers low wear, low friction without lubrication, resistance to dirt and dust, low weight and quiet operation.

## DryLin® R Shaft Guide

DryLin® R

► Chapter 64

DryLin® R linear plain bearings, which correspond to the dimensions of linear ball bearings, use round shafts as the sliding surface. They can be combined with different shaft materials:

- Hard anodized aluminium shafts in combination with DryLin® linear bearings are ideal for applications in which weight reduction and/or high service life is required.
- DryLin® with stainless steel shafts provide excellent chemical resistance and is an ideal solution for applications in the food and packaging industry
- The use of standard steel shafts made of Cf53 hardened and ground steel offers extremely low friction values when running dry at a favourable price
- Cost-effective guides can be designed with steel shafts
- High-tech solutions can be implemented using carbon fibre shafts.

## DryLin® Drive Technology

DryLin® SHT/SLW/SET/ZLW

► Chapter 66

**SHT**  
Maintenance-free spindle-lift tables in various material and shaft combinations. The right module for every application.

**SLW**  
The extremely thin unit is based on a DryLin® W profile system, and its entire length is supported. DryLin® SLW is also available in stainless steel version or cross slide.

**SET EasyTube**  
Simple, but more effective and more solid design: a complete system from few components for simple linear adjustments.

**ZLW**  
DryLin®toothed belt axles have been developed for the quick positioning of small loads.



# DryLin® System Selection

DryLin®  
Linear Plain Bearings

Phone +49 - 22 03 - 96 49-145  
Fax +49 - 22 03 - 96 49-334

igus® GmbH  
51147 Cologne

## Properties

- Max. static load
- Max. application temperature
- Lubrication-free
- Maintenance-free
- Max. surface speed, linear
- Corrosion resistance
- Chemical resistance
- Weight
- Overall size
- Dirt resistance
- Interchangeability (with Ball Bearing Guides)
- Vibration dampening
- Rail/Shaft materials
- Max. rail length
- Rail/Shaft joint
- Compensation of parallelism errors



DryLin® T

DryLin® T linear guide systems were originally developed for applications in both automation and materials handling.



DryLin® N

The low-profile series DryLin® N offers extremely low profiles in several widths.

	14000 N	1000 N
°C	-40°C/+90°C	-40°C/+90°C
	●	●
	●	●
	15 m/s	15 m/s
	++	++
	++	+
kg	++	+++
	standard	low
	++	+
	●	-
	●	●
Rail/Shaft materials	hard anodized aluminium	anodized Aluminium
	2-4 m	2-3 m
	●	●
	±1 mm	±0,5 mm



## DryLin® W

DryLin® W is offered as a cost-effective, fully assembled system. The design of DryLin® W promotes design flexibility and ease of assembly, with both single and double rail configurations.



## DryLin® R

### iglidur® J200/J

DryLin® R linear plain bearings, made from solid polymer, are dimensionally equivalent to standard roller bearings.



### iglidur® X

All bearings with a diameter of 12 to 40 mm can be fitted with iglidur® X liners. Advantages: Temperature resistance up to 250°C; chemical resistance.



## DryLin® SHT

The dry-running maintenance-free leadscrew modules are equipped with iglidur® bearings and permit a multitude of different combinations of materials for the spindles, housings and shafts.

12800 N	> 50000 N	> 70000 N	10000 N
-40°C/+90°C	-40°C/+90°C	-100°C/+250°C	-40°C/+90°C
●	●	●	●
●	●	●	●
15 m/s	15 m/s	5 m/s	15 m/s
++	++	+++	++
+	++	+++	+
++	+	●	+++
low	standard	standard	low
+++	+++	+++	+
-	●	●	-
●	●	●	●
hard anodized aluminium, anodized aluminium; alternative: stainless steel vers. V4A	hart anodized alum., anod. Alum., CFK, steel, chromed stainless- steel, VA-steel	stainless steel, chromed steel	anodized aluminium
2-4 m	3-6 m	3-6 m	2-3 m
●	●	●	●
±1 mm	±0,15/±3 mm	±0,15/±3 mm	±0,5 mm

► Page 63.1

► Page 64.1

DryLin®

DryLin®  
Linear Plain Bearings

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Golden manus® winner for Inspection equipment for offshore drilling riserplant with iglidur® G and DryLin® N - [www.manus-wettbewerb.de](http://www.manus-wettbewerb.de)



igidur® X material for heavy-duty operation at high temperatures in foundries



Filling machine, Krones AG, Rosenheim

### Corrosion Behaviour

The low moisture absorption of iglidur® J, iglidur® J200 and iglidur® X allows design in underwater applications. With the use of stainless steel or anodized aluminium shafts, a corrosion resistant system is achieved. Anodized aluminium is resistant to chemically neutral materials in the PH range of 2 to 7.

For special applications it is advisable to test anodized aluminium sample parts to examine results prior to their use.

### Operating Temperatures

Sliding elements made of iglidur® J and J200 can be used over a temperature range of -40 to + 90°C. If aluminium shafts or rails are used, their high thermal conductivity makes it possible to operate at notably higher loads and speeds. iglidur® X sliding elements can be used from -100°C to +250°C.

### Chemical Resistance

igidur® J is resistant to weak acids, dilute alkalis, fuels and all types of lubricants. An intensive cleaning of machines with standard commercial cleaning agents, even for applications involving foodstuffs, is therefore no problem for the guides.

For applications under heavy exposure to chemicals, it is advisable to use DryLin® R bearings equipped with iglidur® X liners.

The resistance of linear bearings depends equally on the shaft material. Shafts most resistant to chemicals are high-alloy stainless steel shafts such as X105 CrMo 17 (1.4125).

### Chemical Resistance

Medium	igidur® J	igidur® J200	igidur® X
Alcohol	+	+	+
Hydrocarbons	+	+	+
Schmierstoffe, Öle ohne Additive	+	+	+
Fuels	+	+	+
Weak acids	0 to -	0 to -	+
Strong acids	-	-	+
Weak alkalines	+	+	+
Strong alkalines	+ to 0	+ to 0	+
Sea water	+	+	+

+ resistant    0 conditionally resistant    - not resistant

Table 60.1: Chemical resistance of iglidur® J, iglidur® J200, iglidur® X

All specification at room temperature [20°C]

Lifetime calculation, CAD files and much more support ► [www.igus.de/en/DryLin](http://www.igus.de/en/DryLin)