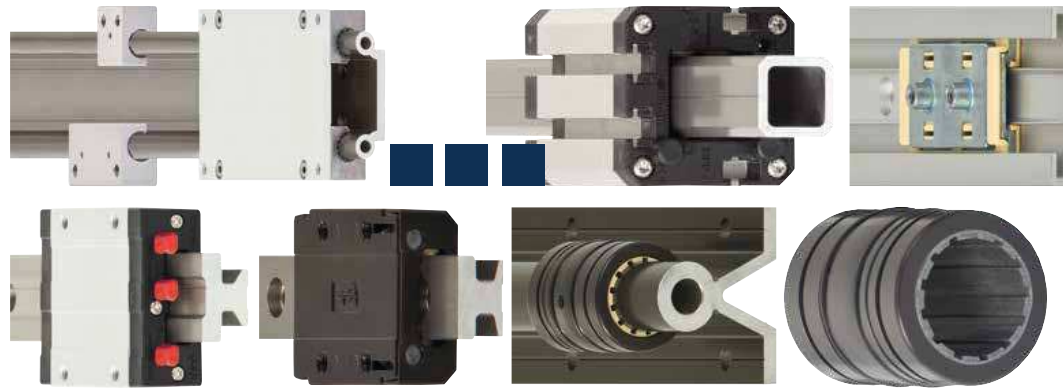


drylin[®]

Linear technology



...plastics

Application examples: drylin®

Improve technology ... Reduce cost.

For years the igus® motto has been "plastics for longer life®". By this we mean the production of innovative plastic products which reduce maintenance work, achieve technical improvements, at the same time as reducing costs and increasing service life, everything delivered immediately from stock. Our references from the practice show the proven employment from drylin® linear guides in a wide variety of applications.

Label feeding system (packaging technology)

Quick and flexible lubrication-free format adjustment at lower costs – implemented with drylin® T rail guide. Further advantage: guide carriage with manual clamp. (Geset Etikettier-Systeme GmbH, Germany)



Champagne bottle sealing machine

Due to freedom from lubricants and chemical resistance, drylin® guides score highly in facilities in the food sector. (Sick International Kellereimaschinen GmbH, Germany)



Forming, filling and sealing machine

Lubrication-free drylin® high temperature linear bearings (up to +120°C) are used in the tool guide system of this forming, filling and sealing machine. (Unifill SpA, Italy)



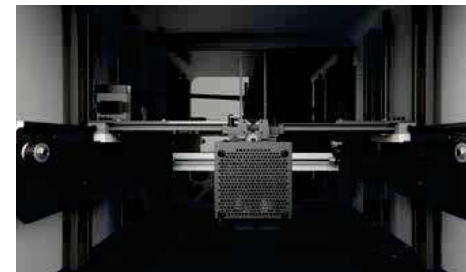
Door adjustment

The smooth, quiet operation and the enormous cost advantages are obtained by the use of drylin® R linear plain bearings on the hard-anodised guide shafts to guide the doors of machine tools. (Alzmetall GmbH + Co. KG, Germany)



System for the production of aluminium cartridges

The absolute freedom from lubricants and the resistance to prevailing paint mist led to the application of drylin® R linear plain bearings. (Mall + Herlan GmbH; Germany)



3D printers









Linear guides of the drylin® T and N series, and the drylin® SD lead screw system travel completely lubrication-free in this 3D printer. This eliminates the risk of contaminating the housing, the filament, and the print result. (Cobot)











Mobile and stationary saw mills

drylin® W modular guide system and iglidur® J liner for adjusting the saw blade guide. (Serra Maschinenbau GmbH, Germany)









drylin® W profile guides

							
Single rails, square: WSQ-XX ▶ Page 976	Pillow blocks, square: WJ200QM ▶ Page 977	Single rails, round: WS-XX ▶ Page 978	Single rails, round made of stainless steel: WS-XX-ES-(FG) ▶ Page 979	Pillow blocks, round: WJ200UM ▶ Page 980	Pillow blocks, round made of stainless steel: WJUM-XX-ES-(FG) ▶ Page 980	Tandem pillow blocks: WJ200UMT-XX-AL ▶ Page 981	Manual clearance adjustment: WJ(200)UME ▶ Page 982









drylin® W profile guides

							
With spring pre-load: WJ(200)UM-XX-P ▶ Page 983	Pillow blocks, single, round: WJ200UMA-XX-AL ▶ Page 984	Double rails: square/round WSQ-/WS-XX-XX ▶ Page 986/992	High torsional rigidity: high profile rails WSX ▶ Page 987/993	Linear guides – lightweight, non-metallic: WSPC ▶ Page 988	Linear guides – lightweight, non-metallic: WSPG ▶ Page 989	Complete carriages: square/round WW/WWQ ▶ Page 990/995	Mono-slide carriages: WWC ▶ Page 991


drylin® W profile guides

							
Round double rail, made of stainless steel: WS-XX-XX-ES-(FG) ▶ Page 994	Assembled stainless steel guide carriage, round: WW-XX-XX-GESG-PES ▶ Page 996	Curved rail profiles: WSB ▶ Page 998	Single bearings for curved rails: W13UBP-XX-LLZ ▶ Page 1000	Carriages for curved rails: WWB ▶ Page 1001	Double rails with machine recesses: WS(Q)-XX-CAM ▶ Page 1002	Complete carriages for slider: WW-XX-SL ▶ Page 1003	Hybrid slider carriages with four double roller bearings: WWH-XX-SL ▶ Page 1004







drylin® W hybrid roller bearings

							
Hybrid rail for lateral installation: WSR ▶ Page 1010	Hybrid roller bearing for hybrid lateral rail: WJRM-31/41 ▶ Page 1011	Single hybrid roller bearings: WJRM-01 ▶ Page 1012	Double hybrid roller bearings: WJRM-21 ▶ Page 1013	Hybrid single and double rollers, stainless steel: WRJM-XX-ES-FG ▶ Page 1014	Hybrid carriages for lateral installation: WWW-21-XX ▶ Page 1015	Hybrid carriages with four double roller bearings: WWH-21 ▶ Page 1016	Hybrid carriages for horizontal installation: WWH-10 ▶ Page 1017

drylin® W hybrid roller bearings


Mounting plate for drylin® W hybrid roller bearing: WWYR ▶ Page 1018

drylin® linear technology – Accessories

					
Manual clamp for simple positioning: WHKA-XX-(AL)/WHKAQ ▶ Page 1020/1021	Manual clamp for higher holding force: WHKD ▶ Page 1021	Manual clamp for drylin® W hybrid roller bearings: WJRM-21-XX-HKA ▶ Page 1022	Liners made from dry-tech® polymers: ▶ Page 1023	Plastic liners: J200UMA-XX ▶ Page 1024	End caps for drylin® high profile rails WSX: WSX-XX-EC ▶ Page 1025

drylin® linear technology – Accessories

drylin® N low-profile linear guides



New

Mounting plate for linear carriage:

WWY

► Page 1026



For small spaces and high load capacity:

Installation size 17

► Page 1034



The largest variety of carriages (options):

Installation size 27

► Page 1036



Suitable for aluminium construction profiles:

Installation size 40

► Page 1038



High loads with reduced height:

Installation size 80

► Page 1040



Prism rails:

NSV-01-27

► Page 1042



Prism carriages:

NWV-XX

► Page 1043

drylin® N low-profile linear guides

drylin® NT telescopic rails

drylin® T rail guides



Accessories:
Manual clamp

NW-XX-HKA

► Page 1046



Accessories:
End cap

NSKB, NSK

► Page 1047



Telescopic rails:

NT-35

► Page 1050



Telescopic rails with locking mechanism:

NT-LM-35

► Page 1051



New

Telescopic guide for higher loads:

NT-60

► Page 1052



Guide rails:

TS-01

► Page 1060



High performance carriages:

TW-12

► Page 1061

drylin® T rail guides



Manual clearance adjustment:

TW-01

► Page 1062



Automatic clearance adjustment:

TWA-01

► Page 1063



With manual clamp:

TW-01-XX-HKA

► Page 1064



Heavy-duty version:

TW-02

► Page 1065



Compact design:

TW-03

► Page 1066



Accessories:

TWBM-11

► Page 1067



Accessories:

TWBM-01

► Page 1067



Miniature guides:

TW-04

► Page 1068

drylin® T rail guides

drylin® R liners made from iglidur® J



Adjustable miniature guides:

TWE-04

► Page 1069



Accessories:
End caps for holes

TSZ

► Page 1070



Accessories:
Replacement plastic sliders

TEK

► Page 1070



Long, closed design for shafts:

JUM-01

► Page 1080



Long, open design for supported shafts:

JUMO-01

► Page 1081



Long, closed design, precise:

JUM-11

► Page 1082



Long, open design, precise:

JUMO-11

► Page 1083

... made from iglidur® J

... made from iglidur® J200

... made from iglidur® E7



Short, closed design for shafts:

JUM-02

► Page 1084



Long, closed design for shafts:

J200UM-01

► Page 1085



Long, open design for shafts:

J200UMO-01

► Page 1086



Long, closed design for shafts:

E7UM-01

► Page 1087



Long, open design for supported shafts:

E7UMO-01

► Page 1088



Short, closed design for shafts:

E7UM-02

► Page 1089

... made from iglidur® X



Long, closed design,
high temperature:
XUM-01

► Page 1090



Long, open design,
high temperature:
XUMO-01

► Page 1091



Short, closed design,
high temperature:
XUM-02

► Page 1092

... made from iglidur® A180



Long, closed design
for shafts:
A180UM-01

► Page 1094



Long, open design
for supported shafts:
A180UMO-01

► Page 1095



Long, closed design
for shafts:
A160UM-01

► Page 1096

drylin® R special designs



Slide disks for large force
displacement

RSDJ

► Page 1098



Clip-on liners

JUCM

► Page 1099



Press-fit bearings
made from iglidur® L100

WLM/WLFM

► Page 1100/1101

drylin® R solid plastic bearings



Standard design
made from iglidur® J

RJM-01

► Page 1102



Standard design, precise,
made from iglidur® J

RJMP-01

► Page 1103



Japanese dimensions
made from iglidur® J4

RJ4JP-01

► Page 1104



Low-cost made from
igidur® J260

RJ260UM-02

► Page 1105

drylin® R linear plain bearings



Closed aluminium
adapters

RJUM-01

► Page 1106



Closed aluminium
adapters, precise

RJUM-11

► Page 1107



Closed adapters made
of stainless steel 303

RJUM-ES

► Page 1108



Closed, anodised aluminium
adapters, short design

RJUM-02

► Page 1109



Closed, anodised
aluminium adapter

RE7UM-01

► Page 1110



Closed, anodised aluminium
adapters, short design

RE7UM-02

► Page 1111



Closed aluminium adapters
floating bearings

RJUM-03

► Page 1112



Split aluminium
adapters

TJUM-01

► Page 1113

drylin® R linear plain bearings



Split aluminium adapters,
floating bearings

TJUM-03

► Page 1114



Open, anodised aluminium
adapters, for supported shafts

OJUM-01

► Page 1115



Open aluminium adapters,
floating bearing

OJUM-03

► Page 1116

drylin® R pillow blocks



Closed aluminium
adapters, short design

RJUM-05

► Page 1118



Closed, adjustable aluminium
adapters, short design

RJUME-05

► Page 1119



Split aluminium adapters,
short design

TJUM-05

► Page 1120



Closed aluminium
adapters, tandem design

RJUMT-05

► Page 1121

drylin® R pillow blocks



Closed aluminium
adapters, long design

RJUM-06

► Page 1122



Closed aluminium adapters,
with manual clamp

RJUM-06-XX-HK

► Page 1123



Closed housings,
floating bearings

RJUM-06-XX-LL

► Page 1124



Open housings,
floating bearings

OJUM-06-XX-LL

► Page 1125



Open aluminium adapters,
long design

OJUM-06

► Page 1126



Open aluminium adapters,
with manual clamp

OJUM-06-XX-HK

► Page 1127



Open, adjustable aluminium
adapters, long design

OJUME-06

► Page 1128

drylin® R flanged linear plain bearings



Closed aluminium adapters, round flange
FJUM-01

► Page 1130



Closed aluminium adapters, square flange
FJUM-02

► Page 1132



Closed aluminium adapters, round flange, tandem design
FJUMT-01

► Page 1134



Closed aluminium adapters, square flange, tandem design
FJUMT-02

► Page 1136

drylin® R pillow blocks



Quad blocks, closed design
RQA

► Page 1138



Quad blocks, open design
OQA

► Page 1139



Closed tandem design
RTA

► Page 1140



Open tandem design
OTA

► Page 1141

drylin® R pillow blocks



Closed, long design
RGA

► Page 1142



Open, long design
OGA

► Page 1143



Closed, short design
RGAS

► Page 1144



Open, short design
OGAS

► Page 1145

drylin® R shafts



Precision aluminium shafts
AWMP/AWMR

► Page 1154



Supported aluminium shafts
AWMU

► Page 1155



Steel shafts
SWM/SWMH

► Page 1156



Supported steel shafts
SWUM/SWUMN

► Page 1157

drylin® R shafts



Stainless steel shafts
EWM/EEWM/EWMR

► Page 1158



Supported stainless steel shafts
EWUM

► Page 1160



Low level supported stainless steel shafts
EWUMN

► Page 1161



Partially supported stainless steel shafts
EWUM-ES/EWUMS-ES

► Page 1162



Low level partially supported stainless steel shafts
EWUMN-/EWUMSN-ES

► Page 1164



Carbon fibre shafts
CWM

► Page 1166



Shaft end supports, floating
TA

► Page 1167



Shaft end supports, fixed
TAF

► Page 1168

drylin® R shafts



Shaft end blocks, standard design
WA

► Page 1169



Shaft end blocks, compact design
WAC

► Page 1170



Shaft end block, narrow design
WAS

► Page 1171



Flange shaft support
WAF

► Page 1172

drylin® Q square linear guides



Square section linear rails
AWMQ

► Page 1178



Adjustable linear carriages
QWE-01

► Page 1179



Adjustable linear carriages with manual clamp
QWE-01-XX-HKA

► Page 1180



Pillow blocks
QJRM(T)-05

► Page 1181

drylin® Q square linear guides



Fixed flange bearings with round flange:
QJFM(T)-01

► Page 1182



Fixed flange bearings with square flange:
QJFM(T)-02

► Page 1182



Solid plastic linear bearings
QJRM(T)-01

► Page 1183



Accessories for drylin® Q

► Page 1184



Clearance adjustment for columns:
ASDJ

► Page 1185

drylin® digital measuring systems



Integrated measuring systems for drylin® Q
QKM

► Page 1192



Ready-to-install measuring systems for drylin® SLW linear modules
SLWWM

► Page 1193



Digital measuring system for drylin® W
WKMM2

► Page 1194



Measuring system with positionable readout display for drylin® W
WKMEDR

► Page 1195



Measuring systems for external data output for drylin® W
WKMEM

► Page 1196

drylin® carbon fibre



Extremely lightweight linear guides
WSPC, WWPL

► Page 1202



Non-metallic toothed belt axis
ZLW-XX-P

► Page 1203



Linear module with carbon fibre high profile
SAW-XX-P

► Page 1204



Linear module with carbon fibre hollow shaft
SHTP-XX-CWM

► Page 1205



Carbon fibre hollow shafts
CWM

► Page 1206

drylin® stainless steel



Closed adapters made of stainless steel 303
RJUM-XX-ES

► Page 1209



Stainless steel guides, single/double rails
WS-XX-ES-FG

► Page 1210/1213



Pillow blocks, made from 316 stainless steel
WJUM-XX-ES-FG

► Page 1211



Hybrid roller bearings made of stainless steel
WJRM-01/WJRM-21

► Page 1212



Assembled stainless steel guide carriages, round
WW-XX-GESG-PES

► Page 1214



Stainless steel shafts
EWM/EEWM/EWMR

► Page 1216



Supported stainless steel shafts
EWUM

► Page 1218



Partially supported stainless steel shafts
EWUM-ES/EWUMS-ES

► Page 1220

drylin® stainless steel



Low level supported stainless steel shafts
EWUMN

► Page 1222



Low level partially supported stainless steel shafts
EWUMN

► Page 1224



Stainless steel linear modules
SHT-ESJ

► Page 1226



"Hygienic design" linear module
SHTC-XX-HYD

► Page 1227



Stainless steel linear modules
SLW-ES

► Page 1228



XY tables stainless steel version
SLW-XY-ES

► Page 1229



Reverse modular axes
ZLW-20

► Page 1230

Lubrication-free drylin® linear guides

drylin® is a product range of lubrication-free linear plain bearings based on the principle of sliding instead of rolling. Tribologically optimised iglidur® high-performance polymers are used as sliding surfaces. The drylin® linear systems use dry operation and are maintenance-free. Linear guides with rails or shafts are available.


The focus is on, besides the freedom from maintenance and lubrication, the ruggedness and insensitivity to influences such as dirt, water, chemicals, heat or impacts.


- Lubrication-free and resistant to dust and dirt
- High static load capacity
- Light, quiet and clean
- Robust and cost-effective

Typical application areas

- Mechanical engineering
- Wood working industry
- Medical- and rehabilitation technologies
- Interior design (furniture/aircraft)
- Automation

 **Available from stock**
Detailed information about delivery time online.

 **Price breaks online**
No minimum order value. No minimum order quantity.

 **Service life calculation**
▶ www.igus-asean.com/drylin-expert



Superior operating properties by combining iglidur® bearing elements and anodised rails with round shaft profiles

Corrosion-resistant with hard-anodised running surface

Quiet operation

Profiles available in various geometries, installation sizes and clearances

Clean with no lubricants required

Lightweight due to the use of plastics and aluminium

Maintenance-free due to integrated lubricants

Smooth operation with iglidur® sliding elements

drylin® rail guides

drylin® W profile guides

- Complex modular systems with more than 30 different profiles and more than 50 carriage options
 - Versatile
 - Easy installation
- ▶ From page 967



drylin® N low-profile linear guides

- Low profile installation heights from 6 to 12mm
 - Lightweight
 - Many carriage options – also with pre-load
 - Pre-load prism slide for controlled adjustment
- ▶ From page 1027



drylin® T rail guides

- Same dimensions as ball guide systems
 - Adjustable bearing clearance
 - Automatic clearance adjustment
 - High static load capacity
- ▶ From page 1053



drylin® shaft guides

drylin® R shaft guides

- Same dimensions as recirculating ball bearings
 - For all shaft materials
 - Lightweight
 - Replaceable liners
- ▶ From page 1071



drylin® Q square linear guides

- Lubrication-free, torque-resistant square linear guides
 - Lightweight profiles made from hard-anodised aluminium
 - Manual adjustable carriages with/without manual clamp
 - Numerous fastening options
- ▶ From page 1175

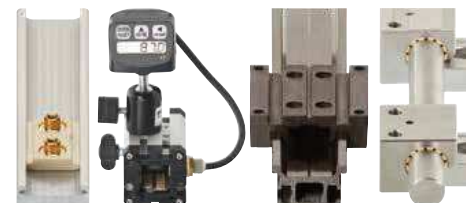


Measuring systems

▶ From page 1187

Special solutions with carbon fibre and stainless steel

▶ From page 1199



drylin® is a range of maintenance and lubrication-free linear plain bearings. This range includes linear units with lead screw, rack and toothed belt drives. The focus is on, besides the freedom from maintenance and lubrication, the ruggedness and insensitivity to influences such as dirt, water, chemicals, heat or impacts.



- Maintenance-free
- Wear-resistant
- Resistant to impacts and vibrations
- Corrosion-free
- Resistant to dirt, dust and humidity
- Low coefficient of friction
- Weight reduction

- Dry operation
- Suited for short-stroke applications
- High static load capacity
- High speeds and accelerations possible
- Self-lubricating
- Extremely quiet operation
- Low magnetism

Optimum load distribution

drylin® linear plain bearings operate on sliding elements unlike the traditional recirculating ball bearing systems. This gives a larger contact surface resulting in lower surface pressure. This leads to advantages which include:

- The use of non-hardened shafts
- The use of non-metallic shafts
- Scratching and shaft damage is completely excluded

Shafts and rail materials

The large surface area of drylin® linear plain bearings, when compared to traditional ball bearings, means that under a given load the bearing pressure is greatly reduced. This allows soft shaft materials to be used, including hard-anodised aluminium, which in turn gives additional benefits in friction and wear rate values, carbon fibre shafts, which offer the lightest option and stainless steel for the highest chemical resistance. Of course, hardened steel and stainless steel shafts as well as hard-chromed shafts can also be used with drylin® linear bearings.

Dry operation, without lubrication

drylin® linear bearing systems are designed for dry operation. As there is no grease or oil present, the application tends to naturally self clean, any particles are wiped away from the sliding surface by the ribbed design of the drylin® polymer bearing. This works well in coarse dirt or even sand. Particles are repelled from the contact surface by the movement itself. Here the front of the sliders works like a wiper. The contact surface remains clean.



Rolling bearings – Point contact



Plain bearings – Surface contact



Resistant to dirt, dust and moisture – By lubrication free insert and dirt channels.

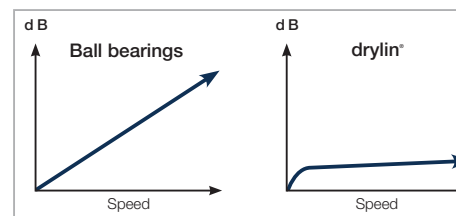
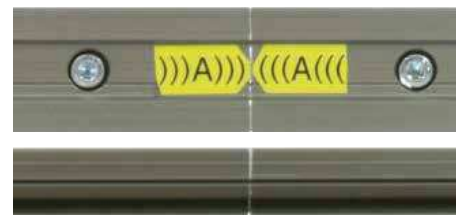


Figure 01: Comparison of noise development



Track joint

Quiet

The quiet operation is also a benefit of sliding rather than rolling. There are no loud collisions between a hard steel ball and the shaft or rail. The sliding motion is extremely quiet and only a light friction noise is audible.

Maximum stroke lengths

The lining up of guide rails (joining) poses no challenge for drylin® linear guides. The guide rails are slightly chamfered, aligned and simply placed behind each other. The joint can be passed over by the sliding element without problems. With the drylin® linear plain bearings, a ball or roller cannot get stuck. In this way stroke lengths of more than 20 meters can be implemented. Assembly is simplified by the distinctive joint marking provided at the factory.



Permitted speeds/acceleration

drylin® linear plain bearings do without rollers and balls. This makes the bearing independent of the mass inertia of this body and can be used with high speeds up to 10m/s and accelerations up to 100g. drylin® linear bearings are therefore especially suitable for applications with light loads, where the speeds should be increased. The use of hard-anodised aluminium as a friction partner lowers the operating temperature in the bearing due to the high thermal conductivity of aluminium. Thus the operation can be carried out with a high frequency even at very short stroke lengths.

The maximum average surface speed results from the load on the bearings. With decreasing surface load, higher speeds can be achieved. More important than the maximum speed reached is the average speed over a period of time, because this has the most influence on the heating of the bearing system. In cases with breaks between the individual cycles, the maximum average surface speed is critical, which is achieved during a period of 10 to 30 minutes.

Thermal conductivity	[W / m · K]
Aluminium	235
Unalloyed steel	48 – 58
High-alloyed steel	15

Table 01: Thermal conductivity

Average surface speed

= Travel distance per cycle [m] / total cycle time [sec].



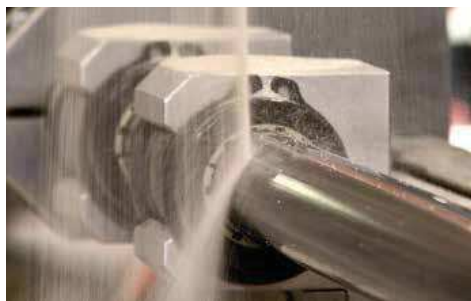
Extreme application conditions in the offshore industry



Filling machine, Kronen AG, Rosenheim (Germany)



The iglidur® X material in heavy-duty use under high temperatures in foundries



Lubrication-free and resistant to dust and dirt

Corrosion behaviour

The low humidity absorption of iglidur® J, J200 and X permits even underwater applications. The application of stainless steel or anodised aluminium shafts provide for a corrosion-resistant guide. Anodised aluminium is resistant to chemically neutral substances in the range pH 2 to 7. For special applications separate tests are recommended for coated aluminium sample parts for that specific application.

Chemical resistance

igidur® J is resistant to weak acids, diluted alkalis as well as to fuels and all kinds of lubricants. The intensive cleaning of machines with standard commercial cleaning agents, even in the food sector, is therefore not a problem for the guides. For applications in environments with aggressive chemicals, it is recommended to use drylin® R linear bearings equipped with iglidur® X liners. The resistance of linear bearing systems is equally dependent on the counter partner. The most chemical-resistant option can be a high-alloyed steel stainless steel shaft, for instance high grade steel (AISI 440B), or alternatively the use of soft VA steels (e.g. (AISI 316Ti).

Operating temperatures

Sliding elements made from iglidur® J and J200 can be used in the temperature range between -40 and +90°C. The continuous operating temperature for overmoulded sliding elements is +50°C. In applications with aluminium shafts and/or rails, distinctly higher loads and speeds can be attained due to the excellent thermal conductivity. Sliding elements made from iglidur® X can be used in the range of -100°C to +250°C.

Use in dirt

Even the application under coarse dirt and sand is possible. Particles are repelled from the contact surface by the movement itself. Seals can be dispensed with due to the dry operation. Dust and dirt cannot stick to grease or oil.

Hard-anodised surfaces

Hard-anodised surfaces are characterised by good wear properties, high chemical resistance and a high degree of hardness. It is a technical and not a decorative surface. Colour alteration and slight cracking may occur, but do not influence the resistance, the corrosion behaviour or the sliding properties. Cutting surfaces and machined surfaces are uncoated.



	The all-rounder – iglidur® J	The specialist – iglidur® J200	The extreme – iglidur® X	The endurance runner – iglidur® E7	The FDA-compliant – iglidur® A180	Blue Sky Thinking FDA/EU-compliant iglidur® A160
Application temperature	from -50°C to +90°C	from -50°C to +90°C	from -100°C to +250°C	from -50°C to +70°C	from -50°C to +90°C	from -50°C to +90°C
Best coefficient of friction with	Steel shaft	Hard-anodised aluminium	Hard-chromed steel	Steel/stainless steel shaft	Stainless steel shaft	Hardened stainless steel shafts
Volume resistance	> 10 ¹³ Ωcm	> 10 ¹² Ωcm	< 10 ⁹ Ωcm	> 10 ¹² Ωcm	> 10 ¹² Ωcm	> 10 ¹² Ωcm
Moisture absorption	1.3% weight	0.7% weight	0.5% weight	< 0.1% weight	0.2% weight	< 0.1% weight
Maximum service life with	Hard-anodised aluminium	Hard-anodised aluminium	Hardened stainless steel	Steel/stainless steel shaft	Stainless steel shaft	Hardened stainless steel shafts
Potential counter partner	All shaft materials	Hard-anodised aluminium	Hardened stainless steel	Steel/stainless steel shaft	All shaft materials	Stainless steel
Permissible stat. surface pressure	35MPa	23MPa	150MPa	18MPa	28MPa	15MPa
Part No.	JUM-...	J200UM-...	XUM-...	E7UM-...	A180UM-...	A160UM-...

igidur® provides various materials for sliding elements and counter partners for drylin® linear systems. Extensive lab tests and years of field experience have shown that iglidur® J, J 200 and X are the ideal materials for most linear applications due to their favourable wear and friction properties.

Ideal material combinations

igidur® J:

- Maintenance-free dry operation
 - Low coefficient of friction with all materials
 - Excellent wear resistance
 - Very low humidity absorption
- More about iglidur® J ► From page 159

igidur® J200:

- Completely maintenance-free
 - Extremely high service life on hard-anodised aluminium
 - Low coefficient of friction with anodised aluminium
 - Excellent wear resistance with anodised aluminium
- More about iglidur® J200 ► From page 261

igidur® X:

- Completely maintenance-free
 - Temperature resistance from -100°C to +250°C in continuous operation
 - Universal resistance to chemicals
 - Very low humidity absorption
- More about iglidur® X ► From page 279

Other possible materials:

igidur® A180, FDA-compliant

► More about iglidur® A180 ► From page 401

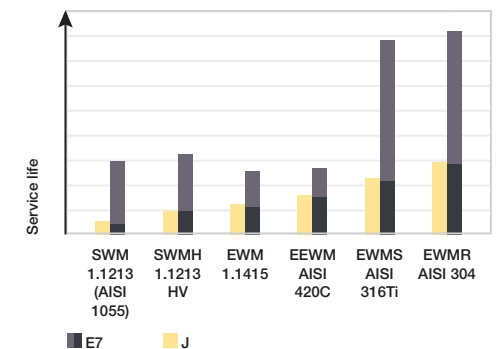
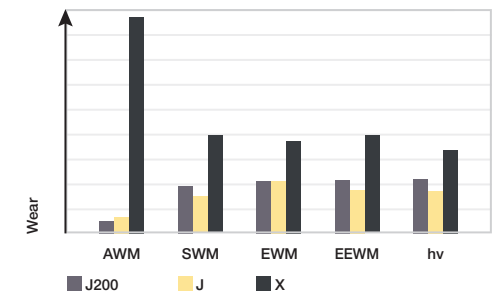
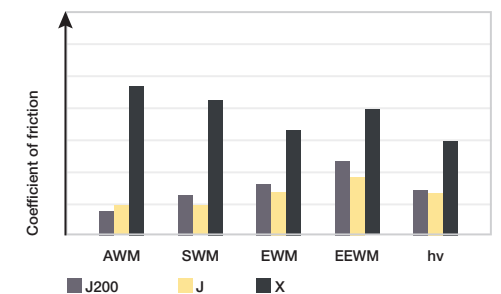
igidur® A160, Compliant with Regulation (EU)

No. 10/2011 and FDA guidelines

► More about iglidur® A160 ► From page 419

igidur® E7, the endurance runner all-rounder

► More about iglidur® E7 ► From page 267



Properties									
	Sizes	Lubrication-free and quiet operation	Dimensionally interchangeable with recirculating ball bearings	Profile rails	Shafts	Square profiles	Single pillow block	Complete carriage	Hybrid roller bearing
drylin® W	5	●		●			●	●	●
drylin® N	4	●		●				●	
drylin® Q	3	●				●	●	●	
drylin® T	4	●	●	●				●	
drylin® T mini	4	●	●	●				●	
drylin® R	12	●	●		●		●		

Special criteria								
	Loads > 100 kg	For robust requirements	Resistant to dirt	Compact, space-saving	Particularly light weight	Torque-resistant	Torsionally stable	Unsupported installation
drylin® W	+	+	++	+	+	+	++	+
drylin® N			+	++	++	+		
drylin® Q			+	+	+	++	+	++
drylin® T	+	+	+			+	+	
drylin® T mini			+	++	++	+		
drylin® R	++	++	++					+

Technical options								
	Manual adjustable bearing clearance	Automatic adjustable bearing clearance	Automatic pre-load	Floating bearing function	Manual clamp	with measuring system	with lead screw drive	with toothed belt drive
drylin® W	+		++	+	+	+	+	+
drylin® N			++	+	+		+	+
drylin® Q	+				+	+		
drylin® T	+	+		+	+			
drylin® T mini	+			+			+	
drylin® R				+			+	

Application areas								
	Stainless steel components	Temperatures above +90°C	Chemical-resistant	FDA-compliant	Cleanroom and ESD	Door/control panel adjustments	Camera slider	3D-print components
drylin® W	++	++	++	++	+	++	++	++
drylin® N		+			+	+	+	++
drylin® Q					+			
drylin® T		+			++			
drylin® T mini					+	+		++
drylin® R	++	++	++	++	+			++

⊕ suitable ⊕⊕ particularly suitable

Aluminium profiles	
	Aluminium, extruded section according to EN AW 6061/6060
Shafts and rail profiles	Surfaces
drylin® W, drylin® T ¹⁵⁵ , drylin® R, drylin® Q	hard-anodised, bare surface
drylin® N, profile with CA marking	clear-anodised, bare surface
drylin® N, profile with AR marking	black-anodised (anti-reflect), bare surface
¹⁵⁵ Exception: TS-11-20 clear-anodised	
Profile straightness tolerances	
Shafts AWMP/AWMR	DIN 754-3; 2mm/m, local 0.6mm/300mm DIN EN 12020-2
Profile rails AWMU/AWMQ, WS/NS/TS	Total length up to 1,000mm; Straightness 0.7mm Total length up to 2,000mm; Straightness 1.3mm Total length up to 3,000mm; Straightness 1.8mm Total length up to 4,000mm; Straightness 2.2mm

Length tolerances of the profiles cut-to-length by igus® [mm]

Length	<400	>400–1000	>1000–2000	>2000–4000
Permissible variations of the standard saw length according to DIN ISO 2768-m	±0.5	±0.8	±1.2	±2.0

Minimum rail profile saw lengths [mm]

drylin® W	Hole spacing			Without holes	
	C4 = 60 ¹⁶²	C4 = 120 ¹⁶²			
Rail profiles WS, WSQ, WSX	100	160		100	
drylin® N	C4 = 60 ¹⁶²		C4 = 150 ¹⁶²		
Size 17/27 (miniature) NS, NS-AR, NSV, NSV-AR	100	–		70	
Size 40/80 NS, NS-AR	100	200		100	
drylin® T	C4 = 15/20/25/40		C4 = 60 ¹⁶²	C4 = 80 ¹⁶²	C4 = 120 ¹⁶²
Installation size 04 (miniature) TS-04	70	–	–	–	70
Installation size 01/11 TS-01/TS-11	–	100	120	160	100

¹⁶² L min: C5 min + C4 + C6 min; saw length examples: drylin® WS-20 rail: C5 min = 20 mm; C4 = 120mm;

C6 = 20mm; 20mm + 120mm + 20mm = 160mm (min. saw lengths).

Lengths less than the minimum saw length upon request

Minimum shaft/square shaft saw lengths [mm]

drylin® R	Hole spacing				
	Shafts AWMP/AWMR				
	100				
Supported shaft AWMU	T1 = 75 ¹⁶³	T1 = 100 ¹⁶³	T1 = 120 ¹⁶³	T1 = 150 ¹⁶³	T1 = 200 ¹⁶³
drylin® Q	115	140	160	190	240
Square profile AWMQ	100				

¹⁶³ L min: C5 min + T1 + C6 min; saw length examples: AWMU-20 supported shaft: C5 min = 20mm;

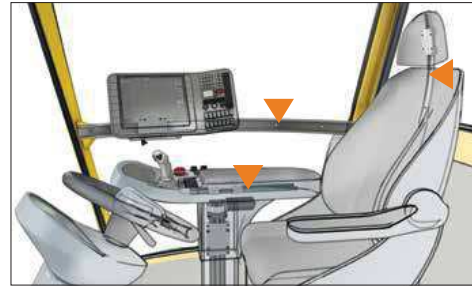
T1 = 100mm; C6 min = 20mm; 20mm + 100mm + 20mm = 140mm (min. saw length)

Lengths less than the minimum saw length upon request

drylin® curved linear guide profiles

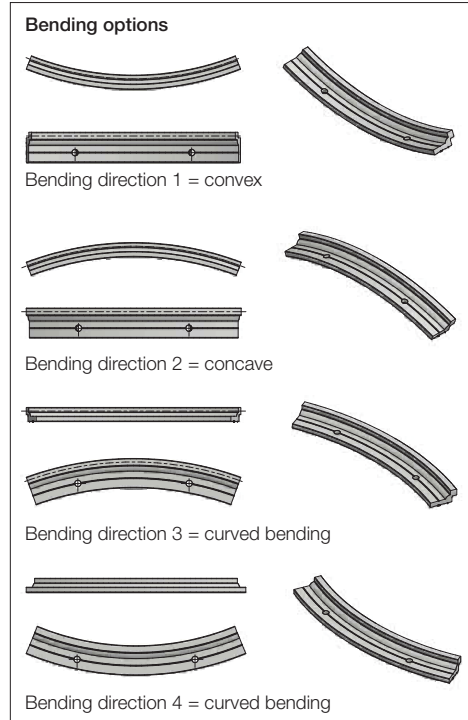
igus® provides customised curved rails for the drylin® W product range. This is especially for the requirements in operating ergonomics, e.g. guiding monitors and control systems in a radius to ensure safe and easy accessibility. New standards can be set in design and construction with a drylin® curved guide.

- Lubrication-free drylin® W carriages for curved rails ► **Page 1001**
- Variable profile directions
- Torque-resistant alternative to curved tube profiles
- Bending option depending on the radius, rail length, bearing/carriage and mounting
- Customised project service



Curved drylin® linear technology – for ergonomic operation and optimal field of view

Bending can give rise to surface changes (anodising, torsion) as a result of the deformation. Rail profiles with clear anodised (CA) surfaces that are undersized by up to 0.15 below nominal diameters are used to improve the surface finish of the curved rails. We recommend a bend radius of no less than 300mm and would like to point out that the surface finish quality after the bending process depends on the material quality. It may vary from batch to batch.



Different radii and bending directions available upon request

Curved rail profiles ► **Page 998**

More Information and checklist online ► www.igus-asean.com/curved

Floating bearings for guide systems

In the case of a system with two parallel guides, one side needs to be fitted with floating bearings. A suitable solution comprising fixed and floating bearings is available for every installation position, whether horizontal, vertical or lateral. This type of assembly prevents jamming and blockage on the guides resulting from discrepancies in parallelism. Floating bearings are created through a controlled extension of the clearance in the direction of the expected parallelism error. This creates an additional degree of freedom on one side.

During installation, take care that the floating bearing has approximately the same clearance on both sides. You can see the version of the fixed/floating bearing system recommended by us in the designs shown in the individual sections about the systems. The mounting surfaces of the guides and carriages should possess a good evenness (e.g. machined surface) to prevent twisting in the system. Smaller areas of mounting surface unevenness can be compensated to a certain extent by the floating bearing.

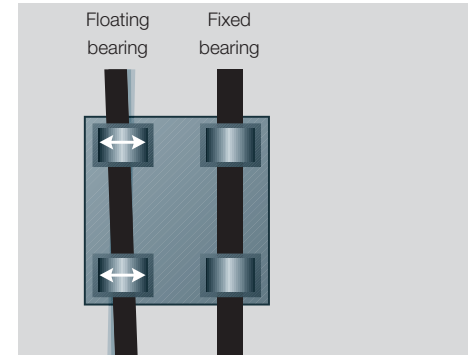


Figure 02: Automatic compensation of parallelism errors

Eccentric forces

To ensure successful use of maintenance-free drylin® linear bearings, it is necessary to follow certain recommendations: if the distance between the driving force point and the fixed bearings is more than twice the bearing spacing (2:1 rule), a static friction value of 0.25 can theoretically result in jamming on the guides.

This principle applies regardless of the value of the load or drive force. The friction product is always related to the fixed bearings. The greater the distance between the drive and guide bearings, the higher the degree of wear and required drive force.

Failure to observe the 2:1 rule during a use of linear plain bearings can result in uneven motion or even system blockage. Such situations can often be remedied with relatively simple modifications.

If you have any questions on design and/or assembly, please make use of our technical support.

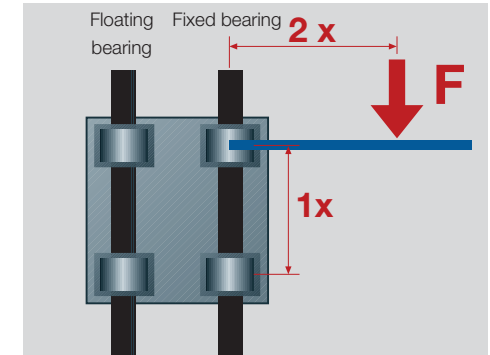


Figure 03: The 2:1 rule

Tightening torque for drylin® metallic screws

Metric thread (Da)	Tightening torque [Nm]	Recommended tightening torque [Nm]
M3	0.5–1.1	0.7
M4	1.0–2.8	1.5
M5	2.0–5.5	3.0
M6	4.0–10.0	6.0
M8	8.0–23.0	15.0
M10	22.0–46.0	30.0

Please be aware of the minimal screw-in depth for aluminium and zinc die-casting parts: 1.5 x Da

Cleanroom suitability and ESD compatibility of drylin®

drylin® linear guides from igus®

All drylin® guides are clearly qualified for cleanroom applications. The differentiation between the various cleanroom classes is only dependent on load and speed of the application. The combination of iglidur® J and hard-anodised aluminium is classified as level 1 in the ESD compatibility according to SEMI E78-0998 (highest rank).



The measurement results of the ESD compatibility according to SEMI E78-0998 show that the linear guide system drylin® NK-02- 40-02 can be classified as "level 1" (highest rank). See Fraunhofer IPA Report No.: IG 0308-295 73

The following drylin® guides from igus® were tested: N40, W10, T25 and T30. See below for detailed results.

drylin® TK-10-30-01 linear guide system

"For the linear guide system drylin® TK-10-30-01 by igus® GmbH, it is possible, on the calculations of the likelihood of violation of threshold values of the detection sizes 0.2µm, 0.3µm, 0.5µm, and 5µm with motion speed of $v = 0.1\text{m/s}$, to clearly derive suitability for cleanrooms classified as ISO Class 3 according to DIN EN ISO 14644-1."

NK-02-40-02 drylin® linear guide system

"For the linear guide system drylin® NK-02-40-02 by igus® GmbH, it is possible, on the calculations of the likelihood of violation of threshold values of the detection sizes 0.2µm, 0.3µm, 0.5µm, and 5µm with motion speed of $v = 1\text{m/s}$, to clearly derive suitability for cleanrooms classified as ISO Class 6 according to DIN EN ISO 14644-1."



TK-01-25-02 drylin® linear guide system

"For the linear guide system drylin® TK-01-25-02 by igus® GmbH, it is possible, on the calculations of the likelihood of violation of threshold values of the detection sizes 0.2µm, 0.3µm, 0.5µm, and 5µm with motion speed of $v = 1\text{m/s}$, to clearly derive suitability for cleanrooms classified as ISO Class 5 according to DIN EN ISO 14644-1."

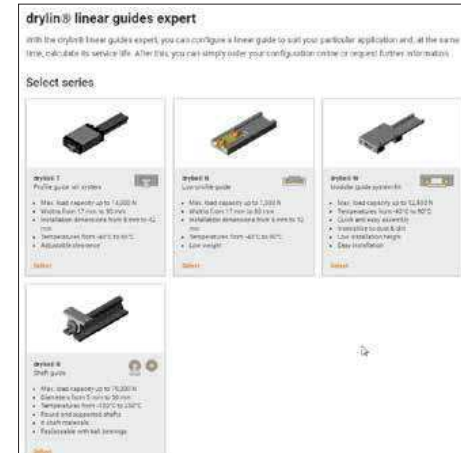
The measurement results of the ESD compatibility according to SEMI E78-0998 show that the linear guide system drylin® TK-01-25-02 can be classified as "level 1" (highest rank).

WK-10-40-15-01 drylin® linear guide system

"For the linear guide system drylin® WK-10-40-15-01 by igus® GmbH, it is possible, on the calculations of the likelihood of violation of threshold values of the detection sizes 0.2µm, 0.3µm, 0.5µm, and 5µm with motion speed of $v = 1\text{m/s}$, to clearly derive suitability for cleanrooms classified as ISO Class 6 according to DIN EN ISO 14644-1."

The measurement results of the ESD compatibility according to SEMI E78-0998 show that the linear guide system drylin® WK-10-40-15-01 can be classified as "level 1" (highest rank).

See Fraunhofer IPA Report No.: IG 0308-295 74



Expert for linear guides: System selection & service life calculation with CAD

Configure linear bearings and calculate their service life – constantly expanded by new sizes and products. Easily calculate the service life of your required linear guide and configure with a few clicks. Select a drylin® system and add the relevant environmental parameters. Select the bearing size, carriage, number and position. Then enter the distance between the rails and the mounting. Define more relevant parameter of the guidance and select a rail length. The results are displayed.



► www.igus-asean.com/drylin-expert



Download the online tool app now



drylin® CAD configurator: Generate complete 3D models for drylin® linear technology according to your specifications

The igus® CAD online configurator gives you the ability to design and save your linear guide as a system, individual components directly as a 3D model in all commonly used formats, or to have these sent by e-mail – free of charge and without registration.



► www.igus-asean.com/drylin-CAD



More information about the products can be found in the igus® download area

- Assembly instructions
- Assembly videos
- System design
- Catalogues



► www.igus-asean.com/downloads